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SIXTH

BIENNIAL REPORT.

OF THE

BOARD OF HEALTH

OF THE

STATE OF IOWA,

FOR THE

FISCAL PERIOD ENDING JUNE 30, 1891.

DES MOINES:
G. H. RAGSDALE, STATE PRINTER.
1891.

STATE OF IOWA,
OFFICE OF THE SECRETARY OF THE STATE BOARD OF HEALTH,
DES MOINES, July 1, 1891.

To HORACE BOISE, *Governor of Iowa:*

SIR—In accordance with the provisions of section 11, chapter 151, laws of Eighteenth General Assembly, the Sixth Biennial Report of the State Board of Health, for the fiscal period ending June 30, 1891, is herewith presented.

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

MEMBERS OF THE BOARD.

	TERM EXPIRES
P. W. LEWELLEN, M. D., Clarinda (Regular)	January 31, 1892
HENRY H. CLARK, M. D., McGregor (Regular)	January 31, 1893
E. M. REYNOLDS, M. D., Centerville (Regular)	January 31, 1894
JOHN C. SHRADER, M. D., Iowa City (Regular)	January 31, 1895
FREDERICK BECKER, M. D., Clermont (Homeopathic)	January 31, 1896
E. A. GUILBERT, M. D., Dubuque (Homeopathic)	January 31, 1897
E. H. CARTER, M. D., Des Moines (Eclectic)	January 31, 1898
JAMES L. LORING, Civil Engineer, Dallas Center	May 4, 1894
JOHN Y. STONE, Attorney-General, *ex-officio.*	
M. STALKER, Ames, State Veterinary Surgeon, *ex-officio.*	

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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) physician, who shall constitute a State Board of Health. The persons so appointed shall hold their offices for seven 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 mid-wives, 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 be always 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 time 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

Law Creating State Board of Health.

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 herin 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 widwives 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 may 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 one thousand two hundred dollars per annum. He shall, with the other members of the board, receive actual

Appendix—Animal Diseases.

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 (1)] certify the amount due the secre- 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 fifteenth day of September* 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 cost 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 the 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 reports 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

(1) As amended by chapter 173, acts Twentieth General Assembly.

tary, and on presentation of said certificate the auditor of State shall draw

*As amended by Chapter 82, Laws of 1888.

Law Creating State Board of Health.

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 ($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 remove 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 ($20) dollars for every day during which he knowingly and willfully 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 occupant, 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 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

Law Creating State Board of Health.

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 April* and the first Monday in October* 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 October* 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 ($25) dollars.

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

*The statute, however, above cited [Secs. 21 and 22], makes it the imperative duty of the local board of health to provide for such person, regardless of his settlement, and if no county can be charged there is no provision in the statute in question for the payment of their expenses. It appears to us that where there is no settlement the sick or infected person must be deemed to belong to the county where the relief becomes necessary. * * * * * * In our opinion, they are to be construed as if the provisions of both sections had been embraced in one section, and the provision as to charging had been placed at the close. If we are correct, then the sick person is properly chargeable with all the expenses which may properly be incurred under either section, including the expenses of removal, if that is adopted, and the expense of isolation, if that is adopted; and we think that the county is ultimately liable for the same, if the sick person, and those liable for his support, are unable to pay.—*Supreme Court, City of Clinton v. County of Clinton, June, 1883.*

*As amended by Chapter 65, Acts Twenty-second General Assembly.

Law Creating State Board of Health.

SEC. 415. The township trustees shall have power to make whatever regulations they deem necessary for the protection of the public health.—*Code.*

SEC. 416. Notice shall be given of all regulations made by publishing the same in a newspaper published in the township, or where there is no newspaper by posting in five public places.—*Code.*

SEC. 418. The trustees shall have power to employ all such persons as shall be necessary to carry into effect the regulations adopted and published according to the powers vested in the trustees, and to fix their compensation; to employ physicians in case of poverty, and to take such general precautions and actions as they deem necessary for the public health.—*Code.*

SEC. 419. Any person who shall willfully violate any of the regulations so made and published by the trustees, shall be deemed guilty of a misdemeanor, and upon conviction thereof, shall be subject to a fine or imprisonment, such fine not to exceed one hundred dollars, and such imprisonment not to exceed thirty days.—*Code.*

PREFATORY.

In presenting this sixth biennial report I am pleased to be able to call attention to the work of the Iowa State Board of Health along the advanced lines of preventive medicine. Almost every phase of sanitary science in its practical dealings has come before the Board, and has not only received prompt attention, but prompt action as well, and always of a progressive character.

Within the last two years some interesting questions relating to the causes of diseases, the laws of epidemics, and the best means of preventing them have been ably discussed, and so definitely settled, that the best preventive and restrictive measures will soon be, if indeed they have not already, been discovered.

Consumption, one of the most wide spread and fatal scourges of the world, is demonstrated to be infectious and curable. The conditions most favoring its incidence are well known, and the measures best adapted to its prevention have been pointed out.

The cause of diphtheria has been fully demonstrated, and I believe its similiarity to, if not identity with, membranous croup has also been well established.

Influenza, or la grippe, because of its rapid spread over nearly the whole world, has attracted marked attention. So far as the weight of evidence is concerned, the opinion is pretty general with sanitarians that it is a contagious or infectious disease; and no better means of prevention are known than isolation and disinfection. There is, however, much yet to learn in regard to this affection.

Small-pox, once so general and so dreaded a disease, scarcely needs mention any more in this State. Vaccination, and its great benefits as a preventive measure, are so well known and so generally admitted that scarcely any opposition to its practice exists anywhere.

Prefatory.

Improved methods of sepulture have been recommended, and are being put to practical test. Cremation, though best of all from a sanitary standpoint, receives but comparatively few advocates because its practice is revolting to most Christian people, and it will be a long time before it is generally or even moderately adopted. There is a growing interest in mummification by a process of desiccation. The illustrated article in the body of this report on the disposal of the dead will explain the plan suggested.

The article on actinomycosis will well repay a careful reading. This is a wide spread, and rapidly increasing disease under a new name; or rather, it is the collecting together of a large number of fatal affections, imperfectly understood, until within a very short time, under one general and appropriate name.

Our State is increasing rapidly in population, large towns and cities are being planted upon our water ways, and manufactories of different kinds are justly encouraged to locate in them. It will be well for the future of the State, as well as for the financial interests of these establishments, as early as possible in their history, to adopt such measures as will least endanger the health and happiness of our people. Happily increase of population and commercial and mechanical industries are not, or need not be incompatible with the best sanitary conditions. The disposal of refuse; the abatement of the smoke nuisance; the deodorization of foul smells; and the disinfection of noxious products before their incorporation with the air, water and soil are easily accomplished—especially if he remedies are applied early.

If the State had a distinct chemical department under the direction of a competent State chemist, to whom all questions relating to the potable condition of water supplies, adulterated foods, and the pollution of our lakes and streams by sewage and other refuse could be referred, it would be greatly in the interests of the health of our people.

I am firmly of the opinion that some member of the State Board of Health should be appointed on the Board of Regents or

Prefatory.

Trustees of every State institution, whether penal, educational or eleemosynary. Such appointment would secure in the construction, and later in the management of such institutions, the best sanitary conditions. Such conditions not only add to the wealth and happiness of individuals, but of those who are fortunate or unfortunate enough to be domiciled within our public institutions.

By virtue of a vacation generously granted me by the Board I was enabled to be present at the International Congress of Hygiene and Demography*, held in London in August, 1891. I am greatly pleased to state that in the light of the discussions held there by the most eminent sanitarians of the world, the Iowa State Board of Health has nothing to undo. The propriety and wisdom of its rules and regulations though, at times verging upon the prophetic, were fully sustained.

Without further particularizing in these prefatory remarks, I most respectfully call attention to the various topics discussed in the body of this report and bespeak for them a most careful consideration.

In the preparation of this report and for the faithful and efficient help rendered by Mr. L. F. Andrews, in the office of the Secretary, at all times, and especially while I was in Europe, I hereby express my hearty appreciation and gratitude.

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

September 15, 1891.

*Relating to Industrial Hygiene—dealing with the conditions of communities from a statistical point of view.

MEETINGS OF THE STATE BOARD.

At the semi-annual meeting of the State Board of Health, held on Wednesday, November 12, 1889, the condition of the public health was duly considered, and much pleasure expressed, that while diphtheria and scarlet fever prevailed in numerous localities, there was no alarming epidemic of these or other contagious diseases throughout the State.

Dr. Becker, from the Committee on Food, presented the following report, which was adopted:

To the Honorable State Board of Health:

Since the last meeting of the Board but little importance has been brought to the notice of your Committee on Food and Water. Still there are a few subjects to which your attention is invited.

Late researches have conclusively shown that disease may be transmitted to mankind through the medium of meat of diseased animals. The milk of cows affected by tuberculous disease has been shown to produce similar or like disease in man. It would, therefore seem necessary that some supervision be exercised by State authority to prevent the use of meat and milk from diseased animals as food. We already have laws for the prevention of the sale of meat from diseased animals as food, but the use of milk and cream from cows affected with tuberculosis and anthrax has never been prevented.

We would suggest that an effort be made by this Board to secure the enactment of a statute which will prevent the sale and use of such products of diseased animals.

Rule Three, of the Rules and Regulations for the Prevention of Contagious Diseases in the Public Schools, was amended so as to require the approval of a local board of health, before a pupil excluded from school on account of contagious disease could be re-admitted to school. The Rule, as amended, is as follows:

RULE 3. Persons affected with diphtheria, membranous croup, measles, scarlet fever, whooping cough, or small-pox must be excluded from school until the school officers, by authority of the attending physician or health officer, approved by the local board of health, grants permission for their admission; and all persons from families where such diseases exist shall also be excluded.

Rule Two, of Regulations for School Superintendents and Teachers, regarding the appearance of any contagious disease in any public or private school in this State, was amended to the same effect, to-wit:

RULE 2. Send the pupil or teacher so affected home at once, and, unless the other children in the family go from home to live, they must also be excluded. Report the name of the pupil or teacher, together with the supposed character of the disease, to the principal or superintendent of the school; or if in a country district, to the school board, *at once*, as well as to the parents of the child. Such a child or teacher, must not be, under any circumstances, readmitted to the school, except upon a certificate from the attending physician, or a health officer, approved by the local board, showing complete recovery, thorough disinfection of his or her person and clothing, and the disinfection of the home.

The Rules and Regulations adopted by the National Association of Railroad General Baggage Agents for the transportation of corpses was adopted.

At the annual meeting of the Board held Wednesday, May 7, 1890, A. E. Guilbert, A. M., M. LL.D., of Dubuque, presented a commission as a member of the Board for the term ending January 31, 1898, to succeed Dr. Olney, whose term had expired.

To emphasize the importance of previous preparation by local boards, for nurses, supplies, etc., against sudden outbreaks of contagious disease, the following resolution was adopted:

WHEREAS, It has become apparent that it is necessary, for the better enforcement of the quarantine laws of the State of Iowa, in order not to perpetuate a cruelty against individuals afflicted with contagious diseases, coming under the quarantine laws of the State and under the rules established by the State Board of Health, all local boards of health be instructed to make in advance, so far as practicable, due provision for the furnishing, and in case it becomes necessary, for the payment of nurses and other necessary aid out of the public funds. Therefore,

Resolved, That the Secretary of the State Board of Health be instructed to publish a circular duly emphasizing this special duty, in sufficient numbers, and to distribute it among the members of the local boards of health throughout the State.

Owing to the small appropriation of money for the use of the board, and the manifest injustice of requiring the members to defray their expenses, aside from the loss of time and neglect of their own patients, in visiting localities to investigate the sources of contagious disease, for the benefit of such communities, the following resolution was adopted:

Meetings of the State Board.

Resolved, That the resolution adopted by this Board May 1, 1889, relating to visits to infected districts by members of the State Board of Health, or by its Secretary, be amended by adding at the end of said resolution the words: "The expenses of these visits shall in all cases be collected from the party or local board requesting such visit, if possible."

At the semi-annual meeting of the board, Thursday, November 30th, the Committee on Legislation was instructed to prepare a bill for an act to be presented to the next General Assembly, giving to the State Board of Health supervision of the sanitary condition of all State institutions, with power to adopt and enforce such sanitary measures as may from time to time be deemed necessary for the health of the inmates thereof, and also to provide for the employment of a competent sanitary engineer, or other means to secure a sanitary survey and examination of such institutions.

Dr. W. H. Dickinson presented his commission of appointment as a member of the board to fill the vacancy caused by the removal of Dr. Miller from the State.

The rules and regulations for the transportation of corpses were amended by adding diphtheria corpses to the list prohibited from transportation.

Rules 5, 6, 7, 8, 9 and 11 for the inspection of products of petroleum were rescinded and substitutes adopted, which appear in another place.

The returns of deaths to the State board from the various counties of the State show "heart failure," as the cause of death in a large number of cases. The term has no value whatever in compiling the vital statistics, and might as well be given as the cause of every death occurring within the State. It is not only indefinite but it is misleading. It is undoubtedly most frequently used as a cover for ignorance. It may be, and has been, used to deceive. To correct, so far as possible, the use and abuse of this term, the following was adopted:

WHEREAS, The use of the term "heart failure," as giving the cause of death in a physician's certificate to the county clerk is too indefinite to be of any value in compiling the vital statistics of the State, be it

Resolved, That a certificate of a death made by a physician giving "heart failure" as the cause of death shall not be deemed a sufficient certificate, and such certificate must be returned to the physician who made it for the proper correction and definition.

At the annual meeting Tuesday, May 12th, the question as to the proper age when children should be admitted to the public schools

Food in its Relation to Health.

was discussed at length. The prevailing opinion was that six years was early enough, though strong arguments were presented showing that under the Kindergarten system, children might safely be admitted at four years of age. The matter was referred to the Committee on Schools.

Dr. E. H. Carter presented his commission as a member of the Board to succeed Dr. Dickinson.

Preliminary steps were taken to secure, by joint action with the State Master Plumber's Association, the necessary legislation to regulate the plumbing and sewerage throughout the State.

Dr. Lewellen, who, upon the death of Dr. Robertson in 1887, was elected President of the Board, declined a re-election, owing to the demands of his professional business, and Dr. H. H. Clark, was elected to succeed him.

FOOD IN ITS RELATION TO HEALTH.

Believing that everybody is deeply interested in the food question, and that there is serious ignorance in regard to what constitutes a proper food supply the following paper upon the above named subject was read by the Secretary of this Board before the annual meeting of the State Medical Society, and was published in its transactions.

"Eat, drink and be merry," have from time immemorial been the aim, and, we can say of the two former, the imperative demand of not merely the human family, but of all animated nature.

The questions: "What shall we eat?" and "What shall we drink?" daily confront us; and upon their rightful solution depend the health, prosperity and morality of every individual.

E. P. W. Glasgow in a recent issue of the *Hospital Gazette* facetiously says:

So it has come to this, that men
Must dine no more on flesh again,
The chances being nine to ten—
Tuberculosis.
The thought's enough to there and then
Cause cyanosis!

Food in its Relation to Health.

I wonder what is safe to eat!
Swine seems as bad as butcher's meat,
For porcine flesh they say's the seat
Of trichinosis,
And even tea, that household treat,
Brings on neurosis.

They are all tabooed—well, let them go!
What though it brings my system low,
And fond friends cry in tones of woe,
"He's got chlorosis!"
Impoverished blood is less a foe
Than scrofulosis.

Farewell my modest evening tea!
Microbic flesh depart from me!
Seductive beer it may not be!
Who wants cirrhosis.
E'en sugar's not suspicious free,
There's teeth necrosis.

No more the cherished hope "Ill hug
That all this cry is mere humbug;
Henceforth I'll feed on "flesh that's dug."
If plants have "oses,"
I'll swill some antiseptic drug
In treble doses.

Our poet in his perplexity and wandering through the "oses" raises a question dear to the heart, and of vital importance to the stomach, of every one, and it is the object of this paper briefly to consider in a practical way the principles that enter into a consideration of the question of food supply.

Since the processes and activities of life result in continual waste of the tissues of the body, it is apparent that a healthy standard of life can only be maintained by the use of those products that repair this loss.

A food may be defined as meaning anything "which, when taken into the body, aids in building up, or repairing tissue, or, by being oxidized or burned in the body, produces vital force or energy." Hence, those foods are most beneficial which contain the greatest amount and variety of assimilable and easily-digested nutritious substance.

As a general proposition it may be stated that all proper food-supplies should contain those substances, that, under proper assimilation, will make bone, muscle, nerve, fat, etc.; and that will in due proportion furnish the fluids required to maintain the physiological functions of the body. To do this it has been demonstrated that food, to meet all the requirements of the animal economy, shall possess in varying proportions

1. Water.
2. Proteids or albumen.
3. Fats.
4. Carbo-hydrates.
5. Salts or mineral constituents.

The large per cent of water found in most of our articles of diet, especially in meats, fruits, and vegetables, together with the fluids we drink,

Food in its Relation to Health.

fully meets every ordinary demand as a water-supply. The salts combined by nature with our food, and used as seasoning, furnish, generally, a due proportion of the mineral constituents. There is, therefore, left for consideration the proteids, fats, and carbo-hydrates, which may be regarded as the three great food principles; and a proper selection and preparation of the articles of food that contain them in due proportion constitutes the wisdom of all sanitary dietetics.

In a general way it may be stated that each of these three food principles has a specific function to perform—that the proteids are "flesh foods, the fats "heat foods" and the carbo-hydrates "work foods."

The *proteids*, otherwise called albumens, constitute the most important and essential of all food supplies. They are found principally in eggs, milk, meat, grain, peas and beans. The blood, muscles and the vital organs are supplied almost entirely by proteids, and hence those foods richest in albumens are best adapted—indeed essential to their proper development and functional activity.

The laboring man, to keep in a healthy condition, should have daily from four to five ounces of proteids in his food. No food can take the place of the proteids in the animal economy—though by assimilative processes one proteid may be converted into another. Physiologists, however, know of no process by which a fat or a starch may be converted into a proteid.

The office of the *fats* is by their combustion, or oxidation, to produce vital heat, and thereby contribute to vital energy. This accounts for the well known fact that in cold countries the inhabitants instinctively consume large quantities of such food. In this climate an ordinary laboring man requires about two ounces of fat daily,

The *carbo-hydrates* consist of those foods which furnish chiefly starch, sugar and dextrine, and the proportion required to impart sufficient strength to the laboring man is from fifteen to eighteen ounces per day.

Of the food furnished by the animal kingdom *meat* is the most valuable, since it consists of water, proteids, fat and mineral salts. Maturity in animals greatly adds to the value of such food. Veal and lamb are not nearly as easily digested, and not so nutritious as beef and mutton. On the other hand, animals may be so old and poorly nourished as to utterly defy mastication and digestion. The better breeds of cattle furnish the best beef at from four to five years of age; ordinary cattle later, generally not before six or seven years of age. In order too, that animal food should be at its best, it should be used in season. While beef may be said to be always in season yet it is never so nutritious and palatable as in the Fall, especially in well-pastured stock. Fresh pork is not at all desirable in the Summer, and the same may be said of fish and some other kinds of animal food.

Prof. V. C. Vaughan, M. D., of Michigan, gives the following rules for the selection of meats:

Good beef has a reddish brown color, and contains no clots of blood. Well-nourished beeves furnish a flesh which, while raw, is marbled with spots of white fat; it is firm and compact. Old, lean animals furnish a flesh

which is tough, dry and dark; the fat is yellow; veal is slightly reddish, and has tender, white fibres; the fat is not distributed through the lean as in beef. The same is true of mutton. In well-nourished animals white fat accumulates along the borders of the muscles.

Good beef is not of a pale, pink color, and such a color indicates that the animal was diseased. Good beef does not have a dark purple hue, for this color is evidence that the animal has not been slaughtered, but has died with the blood in its body, or has suffered from some acute febrile affection.

Good beef has little or no odor; or if any odor is perceptible it is not disagreeable. Tainted meat often gives off a plainly perceptible and disagreeable odor while being cooked. Good meat is elastic to the touch. Meat that is wet and flabby should be discarded; it should not become gelatinous after being kept in a cool place for two days, but should remain dry on the surface, and firm to the touch. Meat which has been frozen decomposes easily after being thawed out, and when cooked it is dry and insipid.

Gerlach, the Director of the Royal Veterinary School of Berlin, advises against the use of

(1) The flesh of all animals which have died of internal diseases, and of healthy animals which have been killed by over driving.
(2) The flesh of animals with contagious diseases which may be transmitted to men.
(3) The flesh of animals which have been poisoned.
(4) Flesh which contain parasites which may be transmitted to man.
(5) The flesh of animals with severe infectious diseases, such as blood poisoning.
(6) All putrid flesh.

It might be said, however, in regard to *fishes* that, while they furnish a grateful change from the ordinary meats, they can never become popular as an exclusive animal diet. They lack the stimulating properties necessary; and unless quite fresh they are not only not palatable but repulsive. Fish taken from polluted streams should never be eaten. They are generally flabby, pale or yellowish in color, soft and spongy, and have a bad odor. There is a popular but mistaken notion that because fishes are rich in the phosphates generally, they are therefore specially adapted to brain workers and to those whose nervous system needs support and repair.

Milk is perhaps the most perfect of all foods. It represents in proper proportion all the five food principles. It is especially adapted to childhood, and during the most rapid and important changes of early life it is the only proper physiological food. And yet milk, instead of being what nature intended, a most agreeable and nutritious agent, may become a poison. In the first place, healthy milk can only be given by healthy cows. That from diseased cows should never be used as food. The best milk may be contamidnate by untidy habits on the part of the dairy man; by being exposed to foul and noxious odors, or by being kept in improper receptacles.

The following kinds of milk are unfit for use:

1. Milk which becomes sour and curdles within a few hours after it has been drawn, and before any cream forms on its surface.

2. "Bitter-sweet milk" is that whose cream has a bitter taste, is covered with blisters, and frequently with a fine mould. Butter and cheese made from such milk cannot be eaten on account of the disagreeable taste.

3. "Slimy milk" which can be drawn out into fine ropy fibres. It has an unpleasant taste which is most marked in the cream.

4. "Blue milk" is characterized by the appearance on its surface, eighteen or twenty hours after it is drawn, of small indigo-blue spots, which rapidly enlarge until the whole surface is covered with a blue film. If the milk be allowed to stand for a few days, the blue is converted into a greenish or reddish color. This coloration of the milk is due to the growth of a microscopic organism. The butter made from "blue" milk is dirty white in color, gelatinous in consistency, and bitter in taste.

5. "Barn yard" milk is a term used to designate milk taken from unclean animals, or those which have been kept in filthy, unventilated stables. The milk absorbs and carries the odors, which are often plainly perceptible. Such milk may not be poisonous, but it is repulsive.

It is generally admitted that typhoid fever, scarlet fever, diphtheria, consumption and other infectious diseases may be caused by milk which has been exposed to and contaminated by the peculiar contagium producing these diseases.

That peculiar disease known as "milk sickness" which has been prevalent in many localities in Illinois, Indiana, and some other States is generally attributed to some native plant eaten by the cattle.

On the fourth of last July, a large number of persons were seriously poisoned by eating ice cream at Adair, in this State. It had been flavored with vanilla, and it was generally believed to be a case of vanilla poisoning —if there is such a thing. Specimens of the cream, and of the vanilla, were sent to the State Board of Health for analysis. Teaspoonful doses of the extract of vanilla, taken internally, produced no toxic effect. The ice cream, however, was, upon analysis, found to contain a considerable quantity of the crystals of tyrotoxicon —an alkaloid discovered by Prof. Vaughan. This ptomaine seemed to have been developed by the high temperature of the weather, and the agitation from hauling the milk for some distance, which produced fermentation. This alkaloid has been found in cheese, canned meats, etc., and when taken into the stomach with the food, it always produces severe gastric and intestinal disturbance, with great prostration, and even death.

Since this fermentation is apt to occur, and to be present even in milk that has not soured, a majority of the medical profession who have given any thought to the subject, believe that cow's milk before being fed to infants should be thoroughly sterilized.

The Dietetic Gazette, quoting Dr. H. C. Haven says:

"It is an admitted fact that the sterilization of milk is one of the most important advances that has been made in regard not only to the treatment of digestive disorders of infancy, but also in artificial infant feeding." He, however, sounds a note of caution when he says: "We must not overlook the fact that the fermentative changes which have already gone on in the milk before its sterilization may have given rise to products of albuminoid fermentation, which may be in themselves sources of disease which cannot be prevented by sterilization of milk at the time of consumption."

It also quotes Prof. John Ottfield, of London, as saying:

"Many failures have conduced to success, and, as usual, have led to simplicity as regards practical processes. Shortly, I find, as a matter of principle, that if you succeed in getting the whole of your material to a temperature of 190° Fahrenheit, for one hour, you render it perfectly sterile. Only when you are dealing with a fluid in an active state of bacterial or microbic growth, do you need to heat it again, similarly, on a second day, to destroy the individuals which were in an earlier state of existence on the previous day—a state in which they existed at 190° Fahrenheit; in all other cases, one heating is enough."

The *Gazette* in conclusion says:

"The present state of information regarding the sterilization of milk, may be summed up as follows:

1. Absolutely pure and fresh milk. This can only be guaranteed in the country, near the source of supply.
2. A temperature of not less than 190° Fahrenheit.
3. Hermetically sealed containers which have been themselves sterilized.
4. The process of sterilization should be conducted by experienced operators, who can determine when the milk is actually sterilized. That this is necessary is evinced by the fact that milk which does not sour is not by any means certain to have been sterilized."

There is strong reason to believe that *cholera infantum* is produced by this poison in the milk given to infants, and that the rubber tube, used in the nursing bottle, is one of the chief factors in the development of tyrotoxicon. It is almost impossible to cleanse these tubes, and the retained milk and the hot weather favor the peculiar fermentation that results in the formation of this ptomaine. It has been demonstrated that warm, healthy milk placed in close cans which retained its heat in a few hours develops a quantity of tyrotoxicon sufficient to produce serious, if not fatal, poisoning.

Milk should never be allowed to stand uncovered in an occupied room. The exhalations from the breath and skin of the inmates, and floating particles of dust laden with disease germs are almost sure to find their way into it.

There is no *fat* so easily digested, nor so palatable, as good fresh *butter*, and none which, in a higher or more perfect sense, represents the important class of heat-producing foods. So universal is its use, so imperative the demand, and so inadequate the supply at a price within the reach of the poor, that recently inventive genius has placed upon the market some substitutes—notably, *oleomargarine* and *butterine*.

Michigan and New York, and possibly some other States, have very stringent and very unjust laws, absolutely prohibiting the manufacture and sale of these substitutes. Iowa, while allowing their manufacture and sale, requires them to be labelled true to name, seeking only, and justly, to prevent their fraudulent sale under the guise of butter.

Both these preparations are valuable food stuffs—infinitely more wholesome and palatable than much of the vile stuff sold as butter.

In the manufacture of oleomargarine the best beef fat is cut from the animal while it is still warm. After rejecting all the soiled and tainted portions, the remainder is cooled and washed in fresh water. It is then ground and afterward heated to about 170° Fah.; an oil is thus extracted which is salted and cooled. A coloring matter is added when it is put with milk into a churn. After thorough churning it is "worked" as butter, pressed into moulds or cakes, and is ready for market. When properly prepared it is hard to tell it from the best creamery butter.

Butterine differs from olemargarine in having a given proportion of hog fat added to the beef fat. The processes of manufacture are the same as for oleomargarine, only the temperature requisite is only about 120° Fah.

Fresh *eggs* furnish a large amount of nutrious material. An ordinary hen's egg weighs about two ounces, and has about sixty per cent of white or albumen, and thirty per cent of yolk, which is principally composed of fat. Though the eggs of but few birds are used for food, it is not known that the egg of any bird is poisonous. The habits and food of birds determine largely the taste and odor of their eggs and their fitness for food. The digestive and nutritive properties of raw eggs, and of those in which the albumen is merely coagulated are about equal. The hard-boiled egg is much harder to digest.

Cheese is highly nutritious, being much richer in proteids and fat than meat. Owing, however, to its severe tax upon the digestive organs, it can only be taken into the stomach profitably in comparatively small quantities. Its value as a food depends largely upon the milk from which it is made—whether from "whole" milk or from skimmed milk, and whether the milk from which it was made had undergone fermentation and the consequent development of tyrotoxicon.

The most important *Vegetable* foods are wheat, rye, oats, corn, rice, potatoes, peas, and beans, and they are valuable and health giving in the varying proportions of proteids, fat, sugar, gum and starch they contain. Peas, beans and wheat contain the largest amount of nitrogenous or flesh making material; oat meal and corn the greatest amount of fat, and hence of heat producing substance, and corn, buckwheat, peas, beans and potatoes the largest amount of starch. Oat meal, peas, beans and buckwheat are richest in the phosphates; and corn, oat meal and wheat furnish the most sugar.

The best known and most important food product from grain is *bread* which has rightly been called the "Staff of Life." Professor Vaughan says of this well known article of food:

"The most important food constituents of the grains, and consequently of bread, are the proteids, starches and ash. The amount of nitrogenous matter is too small for a perfect food and for this reason bread is often taken with some other food richer in nitrogen, such as meat. Bread is also deficient in fat, and man instinctively takes some kind of fat, such as butter or bacon, along with his bread. Notwithstanding these imperfections, bread is a food of which we never tire and the various ways in which it is prepared aid in sharpening the appetite. Beside, while some important food substances

are not abundant in bread all are present to a greater or less extent; and with the addition of a little more nitrogen in the shape of meat and fat, as as butter or bacon, a perfect diet is secured."

What is more luscious than *fruit*—more tempting to the eye; more pleasing to the taste! And yet judged by the food principles enunciated it possesses but little food value. It is a luxury and an appetizer, and is eagerly sought by young and old alike.

Vaughan says: "The real value of fruits, judged by their chemical composition, is small, but when thoroughly ripe, and well preserved, they act beneficially upon the system, improving the appetite and maintaining a healthy condition of the various vital organs. Probably no fruit is necessary to life, and fruits may be regarded as luxuries; but man's instincts and cravings prompt him to obtain them often, even when their cost is considerable. Undoubtedly they are most highly prized by the inhabitants of warm countries, where foods which produce but little heat are desirable. The most enjoyable part of fruits is their juice, which consists principally of watery solutions of sugar and acids. The amount of sugar in fruits varies from one to eighteen per cent. The cellular parts are not easily digested; and those fruits are prized most highly which have the greatest quantity of juice with the smallest proportion of cell structure."

An important discovery made by Dr. C. Bender is, that fruit gives off a great deal of carbonic acid, both in the garden and in the process of hoarding in the house; it is hence very prejudicial to the lungs, to sleep in a room in which apples, pears, etc., are being hoarded.

As regards the physiological action of fruit upon the system, it may be said, in general terms, that the acid fruits, as currants, plums, etc., act as laxatives, while the sweet fruits, as strawberries, pears, and grapes have an opposite tendency. Some people are, however, very sensitive to fruit acids, and cannot indulge without being troubled with numerous little sores on the inside of the lips. In such case it is, of course, better to forego the indulgence. The core, peeling and other cellular substance of fruits is indigestible, and should not be swallowed, the more especially that, being undigested in the stomach, they may create a stoppage in the intestinal canal. Children should be especially cautioned on this head.

Unfortunately, many physicians are not sufficiently well-informed as to the direct beneficial operation of fruit in certain diseases. Professor Uffelman has repeatedly drawn attention to the beneficial effect of fruit in chronic indigestion, and catarrh of the stomach, especially after excessive indulgence in spirituous drinks, also hœmorrhoids, tendency of blood to the head, scorbutic complaints, and in certain diseases of the liver and milt. In every form of febrile complaint, fruit juice, or the cold juice of boiled fruit, is extremely refreshing. It has been remarked that calculus is very rare in cider districts; potash is secreted in the organism of the cider drinker and acts on lime secretions like Vichy water.

The regular fruit treatment is confined mainly to the grape cure. This fruit is longest in season, and produced in greatest abundance. As regards

the quantity consumed daily in chronic diseases, the patient ordinarily begins with a quantity which is gradually increased to six pounds a day. The grapes are not eaten fresh from the vine, for fear of chilling the stomach, especially in the early morning. Preference is given to fruit which has been gathered two days. An interval of from an hour and a half to two hours is allowed to elapse between the meal of grapes and of other food. Milk before or after fruit is not admissible.

The object of the foregoing is to insist that in fruits we have the most pleasant natural remedies for disease, and for the maintenance of health. May this knowledge be widely extended and acted on. Fruit in season should be on the table of every household from morning to night, that young and old may help themselves, to their benefit and delight.

All the substance referred to as essential to proper nutrition, with many others that might have been mentioned, except milk and fruits, require, for their use by the human family, previous preparation by cooking. The nutritive value of all food stuffs depends entirely upon their digestibility, and this latter quality in a larger measure than is generally recognized, is influenced by appearance, odor and taste. And here is where the *preparation* and *cooking* of food plays so important a part. A food may be rendered by cooking so attractive in appearance, and taste and odor as "to make the mouth water," and thus summon in advance all the digestive energies of the stomach, and secure thereby its prompt digestion and assimilation; or, on the other hand, so repulsive as to disgust and repel; or, if taken under protest, to retard, if not defy, digestion. This opens up a large, practical and highly important field of investigation.

Good cooking is not only a wonderful factor in the production and maintainance of the highest standard of health but contributes immensely to economical living.

Edward Atkinson, LL.D., of Boston, in his "Art of Cooking," in pleading for stopping the waste from improper cooking, and applying the saving thereby to the purchase of better homes and clothing; estimates the waste per day at five cents for each adult, and at two and one-half cents per day for each child under ten years of age. The aggregate of this waste per year at the present estimated population of the United States amounts to the enormous sum of over one billion dollars, an amount greater than the cost of all the public buildings of Iowa.

If this be true, and if good cooking also conduces to better health and greater ability for work, truly no further argument is necessary to convince all of the necessity of more general instruction upon the health giving, palatable and economical preparation of food.

In the near future the day is coming when the selection and preparation of foods, and the science and art of cooking shall be a part of the common school education of all the boys and girls of the land—when no young woman shall be considered "accomplished" unless she has a practical knowledge of this most important department of a well-ordered home.

Not only is it important, however, to know *what to eat* and *how to cook it*, but it is also important to know *when* to eat and *how* to eat. As a general

rule it is safe to eat when nature demands food—when one is hungry; and yet the amount eaten should never be sufficient to overload the stomach. There is too great a variety of food taken. A few articles of food selected in conformity to the food principles laid down, are infinitely better than the conglomeration too often indulged in. The poor stomach is often taxed with the effort to digest two or three kinds of meat, butter, milk, cheese, eggs, pickles, slaws, two or three kinds of vegetables, raw and cooked; bread, pastries, cakes, ice cream, coffee or tea, fruits, nuts, and occasionally malt or spirituous liquors, all taken at one meal. Such an imposition often results in a miserable failure on the part of the stomach in its efforts at digestion; and in producing gastric and enteric troubles with some reflex headache, and if persisted in, in chronic dyspepsia.

It is best not to eat immediately after severe exercise, nor to eat heartily just before boing to bed—though one should never go to bed hungry if possible.

Some one has said, and truthfully:

> "Great suppers a very great evil we call;
> That your sleep may be sweet let your suppers be small."

It is always dangerous to work hard or to take any violent exercise immediately after eating a hearty meal. The best selected, and the best cooked food may under such circumstances become a source of danger, instead of one of satisfaction.

Iced drinks should not be used in connection with the meals, since no digestion can begin until the temperature of the contents of the stomach has reached about 100° F. Hence warm drinks, if not taken so liberally as to unduly dilute the gastric secretions essential to digestion, are to be commended—especially hot water with a little cream and sugar. Coffee disagrees with many and should never be taken in the evening, nor just before going to bed, as it is almost sure to produce wakefulness.

There should be thorough mastication and insalivation of the food, and the time occupied in eating should never be less than thirty minutes.

In conclusion, the facts stated in this paper may be briefly summarized as follows:

1. All vital processes result in constant tissue waste, which can only be adequately met by a proper food supply.

2. All nutritive foods may be grouped into five classes—called the five food principles—viz: Water, proteids, fats, carbo-hydrates and salts.

3. All food supplies, in order to produce and maintain the most perfect physical and mental development, must contain all these food principles in proportions pretty definitely determined, and hence, neither an exclusively vegetable nor animal diet should be adopted.

4. All meats, to be commended, should be fresh, or properly cured; and should always be from animals slaughtered in good health; and meat from mature animals is more easily digested than that from those immature.

5. That the grains and vegetables most nutritious are those richest in the proteids and fats; and that all vegetables should be as perfect as possible.

6. That bread, with a due proportion of butter or fat, is a perfect food.

7. That milk should always be from healthy cows, and should be kept in a cool place, properly covered, and under conditions to protect against the possibility of pollution by disease germs.

8. That there is reason to believe that cholera morbus and cholera infantum, and the many cases of poisoning after eating ice cream and cheese, are due to the formation in the milk, during fermentative processes, of an alkoloid called tyrotoxicon.

9. That fruits are not rich in food products, but are desirable as luxuries and aids to digestion.

10. That the best selected food supplies demand for their proper digestion and assimilation proper preparation and cooking; and,

11. That the science and the art of cooking should be an important part of the education of all our youths—not only in our colleges and high schools, but in the common school as well.

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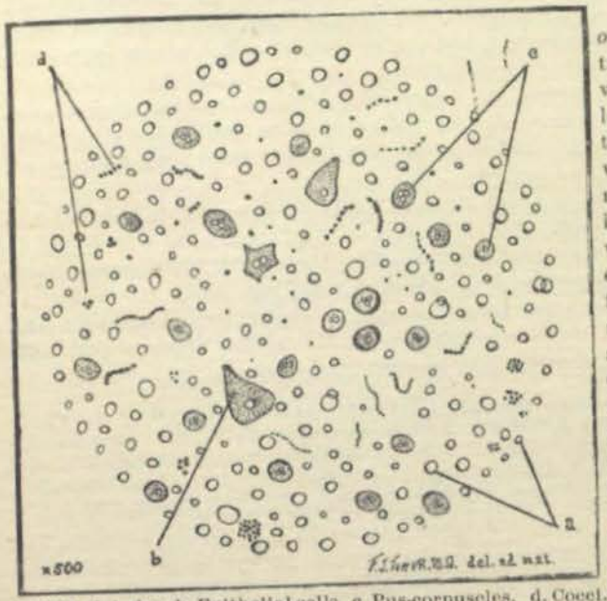
MILK INFECTION.*

Considering that at least 7,000,000,000 gallons of milk are consumed in the United States alone, it seems a matter of more than little importance to appreciate the source of milk infection, especially when we find milk more ready than any other aliment to absorb poisonous substances and become a culture-bed for numerous germs and an undoubted carrier for such diseases as tuberculosis, anthrax, typhoid fever, diptheria and scarlatina. How many cases even of tabes mesenterica and typhoid fever are caused by infected milk it is hard to say, but certainly a large per cent can be traced to it. The origin of a late siege by an amœbic dysentery that one of the Eastern cities has had could undoubtedly be found in the adulteration of milk with water from a source contaminated with this amœba. Water from a stream upon which are situated distilleries, glue factories, wool-cleaning establishments, or which has sewers running into it, when drank by cattle will infect the milk with many varieties of vegetable and animal life of a low form, and is very detrimental, not only when fed to infants and invalids, but causes diarrheas and gastric disturbances in healthy adults.

*By F. J. Tower, M. D., in *Medical Record.*

Milk Infection.

FIG. 1.



a. Milk globules. b. Epithelial cells. c. Pus-corpuscles. d. Cocci.

Varieties of Poisonous Milk—1. Milk taken from a cow with garget and allowed to stand for twenty-four hours, will on proper treatment and great care in manipulation, which is always necessary when treating for a ptomaïne, furnish an alkaloidal substance of which 0.01 gram injected subcutaneously in a rabbit will produce death in about sixteen hours. In Fig. 1 is seen the microscopical appearance of such milk, showing cocci, epithelial cells, pus-corpuscles and the milk-globules.

2. When adulterated with water into which the excrements of a typhoid fever case have found a way, the milk will give the Ehrlich diazo-reaction, which depends upon the formation of an anilin-red from the amine products of the bacillus typhosus. The destruction by disinfectants of the organisms in the feces does not necessarily render them inocuous, for the poisonous albuminoids still remain, and administered with the milk in which they are found, produce a typhoid condition in animals.

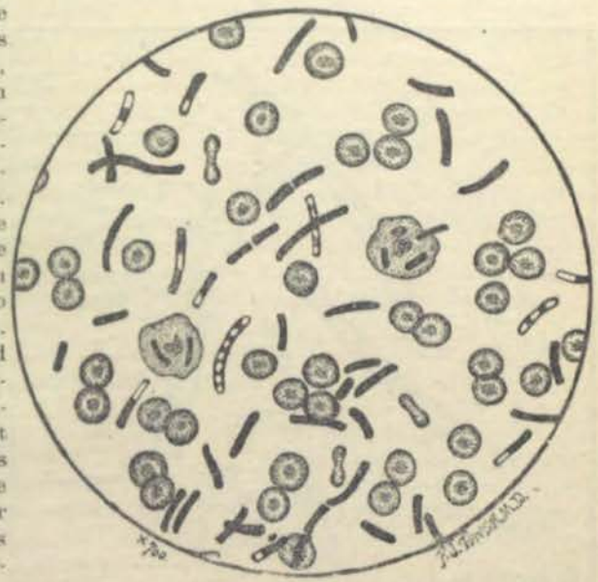
3. Milk from a cow suffering with anthrax, taken in the quantity of 0.3 gram, and injected at the base of the tail of a mouse, will in two days kill the animal and the blood will be found to teem with the bacillus anthracis. Fig. 2 shows a fresh cover glass preparation of blood from a mouse killed by anthrax; the white corpuscles, of which two are seen, are entered by the bacilli.

4. The milk of an animal affected with any condition of debility or febrile disorder is viscid and will coagulate almost immediately on removal; it will be found to contain ammonium carbonate in very appreciable quantities, also several organisms, and appears under the microscope to resemble colostrum, which it is not, for a very small quantity of the milk added to fresh milk will produce a like condition. The reaction is very alkaline; the milk has a peculiar soapy taste and the milk globules are irregular in shape, the emulsion being poor.

Milk Infection.

5. In milk which has stood in a damp place for twelve hours tyrotoxicon is found to such an extent that many cases of poisoning are at present on record, and many more, in which the cause of death was only suspected, might have been traced to the presence of tyrotoxicon in food containing the milk. The cases in ice cream and cheese poisoning are in most cases due to the same agent. The frequent and even pardonable inability of the chemist to find the exact cause often leaves us at sea for a cause for the sickness or death, as oftentimes physiological experiments, and not chemical analysis, will determine for us the presence of the alkaloid. This tyrotoxicon is the product of several varieties of bacteria, as I have been unable to procure any pure culture from milk containing it. In warm weather, especially after much rain, and when the heat causes a slight vapor to arise from the ground of damp places, milk in a very few hours becomes poisonous. At such a time of the year, when infantile diarrhœa is very prevalent, there is no doubt but that the milk in most cases contains the tyrotoxicon.

FIG. 2.



6. Among the coloring material used by dairymen to give skimmed milk a creamy appearance is a substance which is very frequently adulterated with red-lead and the annatto (so called) becomes a poisonous substance and quite unfit for use. One case of this kind has been reported. Saffron is also used as a coloring matter for milk, butter and cheese, but as the oil of saffron is not miscible there is slight danger from the effects of the ingested saffron.

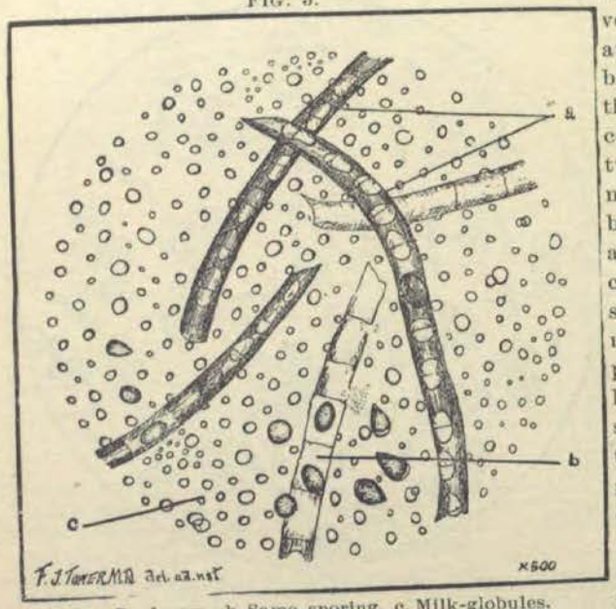
7. Milk from a swill fed cow I find to contain one of the confervæ, a low order of vegetable life, in fact, an alga. The fats are deficient, the milk is thin in consisteney, and of a faint bluish tint, very much like skimmed milk. In Fig. 3 is shown a speciman of milk such as I describe.

8. In many milks there is found the oïdium lactis, which is a penicillum, and seems to exert a very detrimental influence upon young bottle-fed

children. Whether it is the actual presence of the oïdium or the inferior quality of the milk that causes the disturbance, I have not demonstrated.

Colored Milk.—1. Blue milk has a very disagreeable taste, and when drank will produce very severe gastritis and diarrhœa. The bacillus cyaneus is the cause of the blue color. There are two varieties of blue milk—that which is blue when milked, and that which becomes blue upon standing. The former is very slightly poisonous, while the latter is very much so. Both contain the bacillus, but the grade of toxicity is determined by the non-development of one and the maturity of the other.

FIG. 3.



a. Confervæ. b. Same, sporing. c. Milk-globules.

2. Yellow milk. Beside coloring matter introduced by the dairyman to make the milk appear richer, there is found a bacterium xanthinum, and also a vibrio xanthogenus, which are found in a pure culture on glycerin-agar and on nutrient gelatin to produce a yellow film; the bacterium is aerobic, so that the lower portions of the milk are apt to be free from the growing organisms, though it will contain the products and may even be more deleterious in its effects than the upper stratum. The eating of rheum palmatum or some of the orchids will give milk a yellow color. I have found a penicillium, the spores of which are yellow, growing on milk left for a few days exposed in dry places to the atmosphere, giving an appearance of grated lemon peel upon the surface of the milk.

3. Red milk usually comes from feeding the animal madder or galium (called also bedstraw). The spirillum rubrum will grow on milk, though there are no cases describing such a condition. At rare times blood finds its way into milk, and gives it a reddish hue.

4. Brown milk. Among many experiments made during the past year I find that on exposing milk to the air of certain localities a fungus will occasionally be captured, the products of which are brown, which, extending into the surrounding milk, give it a rusty-brown color. The sporegrowth of this one of the fungi presents no difference from that of the

oïdium lactis. It thrives better when a small per cent of cane sugar has been added.

5. Green milk is very rare. It may possibly arise, under some circumstances, in ulcer of the udder, from the presence of the same organism which causes green pus, though I have not seen such a condition. Green milk, as it does actually occur, is due to two causes, one a physical cause and the other organismal. From the first: a very large amount of fat is found, so that the emulsion is poor, and the fat in masses throughout the milk gives it a greenish tinge. From the other: when the causes of blue and yellow milk are both active in the same milk, this appears green in color; the result is a mixed culture divisible into the two distinct varieties.

Odors, etc., of Milk.—The natural odor of milk is due to a minute proportion of H_2S, which rapidly leaves it, and we fail to get the faint animal smell. Owing to the presence of the albuminate substances, *i. e.*, casein, sodium albuminoid, etc., there is great liability to fermentation and to absorption of odors from its surroundings. When a quantity of milk is left exposed to any noxious gas, it becomes contaminated within a very short space of time.

The normal amphioteric reaction of milk well suits it as a medium for the growth of low forms of vegetable life. Take the torula, for instance—though cane sugar is necessary for its growth. In milk to which saccharose has been added, the yeast-plant finds a feeding ground, and breaks up each molecule of grape sugar, into which probably the cane sugar has first been changed by a simple hydration—

$$C_{12}H_{22}O_{11} + H_2O = 2C_6H_{12}O_6$$

$$C_6H_{12}O_6 = C_2H_5H\,O + 2CO_2$$

the carbonic dioxide rising in bubbles and the alcohol remaining in solution in the milk. Upon this property of yeast is founded the manner of koumyss-manufacture.

If the clostridium butyricus finds an entrance into milk it changes the lactic to butyric acid, and the milk then has the faint pineapple odor of that acid. This may occur when milk is even sealed up from the air, provided the clostridium gains an entrance to the milk before sealing, for the organism is an anaerobic bacterium, and does not need oxygen for its growth.

When the cow suffers from any disease of the liver that prevents proper elimination of the bile-acids and salts, the milk will be exceedingly bitter. There is no difference between the taste of such milk and that which comes from the cow after the ingestion of leaves of the chestnut tree. When even a small quantity of the plant symplocarpus fœtidus is eaten, the milk has an odor quite equal to mephitus itself; not so bad, but still sufficient for those who dislike onions, is the odor when any of the allia are eaten. Turnips fed to cows impart their taste to the lacteal fluid.

A few words upon the vitality of the commoner growths in milk will not be out of place in this sketch. When the alcohol in milk undergoing yeast-fermentation reaches about six per cent the growth ceases — is, in fact,

Milk Infection.

destroyed by its own production. This is true in all cases, but in some it takes a much longer time for the growth to exhaust itself, as it may be slow or the organism a particularly resistant one. Organisms, if left to themselves, die or cease to grow from one of two reasons: one, when they exhaust the material in the pabulum favorable to their growth and propagation; and, secondly, when they produce a substance poisonous to not only many higher grades of life, but to themselves, as, when the torulæ produce alcohol, or the tubercle bacilli an alkaloidal substance. The vitality of the tubercle bacillus is far greater than that of any other micro-organism commonly found in milk, some of which containing the bacilli may be boiled for four minutes, and if an inoculation be then made upon sterilized blood-serum, the growth, though somewhat tardy, will take place. The gastric juice does not destroy them. For a fluid medium a spit-culture is one of the best to make. Milk should always be boiled for thirty minutes, bottled, and then allowed to cool, and there will be no danger in using it. The spores of the tubercle bacillus may even be demonstrated by successive cultures though not seen in the specimen, for they do not stain in milk that contains them. Milk that has been treated with carbolic acid for fifteen hours will make successful cultures; not until from eighteen to twenty hours will the bacilli be destroyed. As a comparison of vitality the cultures of staphylococcus aureus are checked by a 1 to 30,000 iodine solution, while moist heat (100° C.), the best of all sterilizers, fails to destroy the tubercle bacillus in several minutes.

Now to descend upon a more practical footing, where our remarks will apply to everyday protection. Always suppose that every milk is dangerous to health as it is freshly received; boil for thirty minutes, ascertain that it contains no fungoid growths, has a specific gravity of about 1.033, contains three per cent or more of fats, and approximately four per cent each of lactose and albuminoids (casein, etc.).

In June, 1890, Herbert E. Smith, M. D., by direction of the Connecticut State Board of Health investigated an outbreak of typhoid fever at Waterbury, in which there were one hundred cases in sixty-one houses. The result showed that three families all received their milk supply from the same dairy farm. These families were scattered about the city. The dealer carried milk from three farms, but the sickness was confined to families who received their milk from one of these farms. It was found that in May and June the dairy farmer, his daughter and a farm hand were sick with typhoid fever; that the daughter died; that the hired man was ill several days before he gave up and went to his bed; that he defecated in the stables, throwing the stools into the yard; that the milk shed, was a part of the barn, in which the pans were washed; that the milk was infected from bacillus dried and blown about in dust, and

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that all the conditions about the dairy were favorable to these conditions.

At Dundee, Scotland, thirty-six cases of typhoid fever occurred among the customers of one milkman, and three children of the milkman were found sick with the disease in one room adjoining the milk room.

At Aberdeen, Scotland, sixteen cases of typhoid fever were caused by milk from a farm where the disease existed.

At Penzance, England, over thirty cases of typhoid fever were traced to a case in the family of the dairyman.

In 1883, at Allegheny City, Pa., forty-eight cases of typhoid fever occurred, scattered over the city. All but one was traced directly to one milkman. An inspection of his dairy showed that a few feet from the upper stable was a well which furnished all the water used on the premises. A short distance above this well, on the hill side, there was a large, deep privy, filled to the surface. The natural course of the surface drainage as well as the seeping through the earth led directly to the well. It was also discovered that a son of the milkman (whose dwelling was very near the privy) had been sick with typhoid fever. As there was no dairy building on the premises, it is supposed that the milk was kept in the house where the sick boy lay. The well water was analyzed and found to be badly polluted. The natural inference is that this man diluted his milk with the well water, or washed out the cans with it.

In 1883, at Port Jervis, N. Y., there were one hundred and forty-eight cases of typhoid fever scattered over the city. They were all among customers of the same milkman, in whose family there was the disease. Dr. F. C. Curtis, by order of the State Board of Health investigated the matter, and summed up his report to the board by saying: The epidemic was one of true enteric fever; it made it appearance in a previously healthy locality; it arose suddenly and disappeared suddenly; it exhibited no local foci of infection; it affected several members of a large proportion of the affected families; eighty-seven per cent of the cases occurred among persons using the milk supplied by one milk vender; the possibility of the milk becoming infected from the cases of the diseases at the dairy farm is established. I would report, therefore, that the epidemic was caused and spread through the medium of infected milk.

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At the International Medical Congress of 1881, Ernest Hart, editor of the *Sanitary Record*, read a paper in which he gave a summary of the fifty epidemics of typhoid fever, embracing about three thousand five hundred cases, due to milk infection. These epidemics had all been the subjects of detailed investigation in England alone, during the past eight years.

In England, dairy farms are now under such inspection as generally leads to the discovery and correction of dangerous conditions which ignorance or cupidity might have allowed to exist. Although such official inspection is not required by law in this State, milk producers and dealers will further their own pecuniary advancement, even if there were no other motive, by seeking for information on this subject, and by taking all necessary precautions to preserve the purity of the milk which they handle.

The following facts may be mentioned as bearing upon this subject: Cases of typhoid fever are caused by infection from previous cases; persons may be affected by this fever and infect other persons, without being so ill themselves as to be confined to bed, and thus the disease may exist among those having the care of milk, but escape detection. The specific cause of typhoid fever is chiefly disseminated by means of the stools. The commonest method by which milk is infected is by means of water used for washing the cans, etc., the water receiving the contagium by drainage from the contents of privies, cesspools, etc., into wells, cisterns, springs or streams. It is, therefore, of the highest importance that the source of water used in dairies should be protected. It is to be particularly noted that water may be contaminated, even from such sources as above mentioned, without showing any evidence of it to the senses.

Privies on dairy farms should be properly located, properly constructed and properly cared for, and their proper use should be insisted on, because of the dangers of direct contamination of milk by those concerned in the care of it.

Diseased Meat for Food.

DISEASED MEAT FOR FOOD.

There is no one subject more directly connected with every-day life of a people than the food supply. Mercenary greed, unscrupulous men, and trade competition, constantly expose them to danger and fraud, by infection or adulteration.

One of the most important articles of food is meat. Among all civilized countries meat is the principal article of food. It is important, therefore, that the meat be healthy, nutritious, and free from disease or taint.

There are three classes of poisons which render the flesh of animals dangerous for human food:

1. Parasites.
2. Gaseous, vegetable and mineral.
3. Animal.

Of the first class there are numerous kinds which so long as they remain in the animal continue in an imperfect state, but when they enter the human system they are developed into their perfect state, some causing mere disturbance, some serious disorders, and some causing death. The most abhorrent is the *trichinæ spiralis* of pork, sometimes also found in cattle, which neither drying, freezing, salting or smoking of the meat will destroy. This parasite is described more fully in another place in this report.

There is also the *cysticercus*, or measle of pork which infests the muscles of all parts of the hog. Taken into the human system, by the barbed hooklets surrounding its head, with four sucking mouths, it fastens itself to the intestines, is transformed into the *tenia solium*, or tape-worm; if from beef, the *tenia mediocanellata*, or another tape-worm. That from beef is the most common in the human intestines.

By a like process of transformation the *tenia echinococcus*, or little tape-worm of the dog, is dropped in pastures, becomes dried and, as dust attaches to herbage, is taken in the stomach of cattle and sheep, becomes encysted, passes as food into the human

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stomach, migrates to distant parts of the body, and finding a suitable resting place slowly becomes a large *hydatid*. For a habitat in sheep it selects the brain, producing the disease known as "staggers." In cattle it seeks the peritoneal cavity. In man it haunts the liver, causing a large per cent of the mortality of the country.

The *tenia mediocanellata*, or measle of veal, which, says Letheby, immediately on entering the human stomach are transformed into the tape-worm.

The flesh from animals affected with tuberculosis, or lung disease, says Gamgee, when eaten by man induces boils and carbuncles.

Foot-and-mouth disease is another malady which attacks cattle. The flesh from an animal in the advanced stages of this disease is highly dangerous.

The flesh from animals affected with milk sickness or "trembles," when eaten by man, causes prostrating sickness, and if there is partial recovery, he remains in enfeebled condition the remainder of life. The milk from such an animal causes severe sickness, and frequently death.

The flesh of cows in parturition or affected with puerperal (milk) fever is utterly unfit for food. From its use many deaths are reported.

Anthrax is a malignant, contagious disease, affecting cattle and sheep. It is transmissible to man, and is fatal.

The flesh of animals that have been excited, before death, as over-driving or torture, is unwholesome. Liebig mentions an instance of a family of five persons who were made seriously ill by the flesh of a roebuck which had been caught in a snare and had struggled violently before death. If a butcher while dressing one of these over-excited animals, makes a wound on his hands, the symptoms are similar to those made by dissecting the dead body of a human being. The flesh when eaten causes fever and dysentery.

In general, the flesh of animals affected with hip disease, abscesses, tumors, enlargement of the joints, cancerous jaw, that have died from drowning, lightning stroke, choking, hoven, and of sheep affected with dry rot, is all of dangerous character and should not be eaten.

Diseased Meat for Food.

Gerlach, director of the Royal Veterinary School, at Berlin, gives the following list of meats which should not be eaten:

1. The flesh of animals which have died of internal diseases, or which have been killed while suffering from such disease, and of healthy animals which have been killed by over-driving.
2. The flesh of animals with contagious diseases which may be transmitted to man.
3. The flesh of animals which have been poisoned.
4. The flesh of animals with severe infectious diseases, such as blood poisoning.
5. Flesh which contains parasites that may be transmitted to man.
6. All putrid flesh. The flesh of healthy animals may become poisonous from decomposition.

It is safe to assume that converting the flesh of deceased animals into the human body is liable to produce like diseases in those who eat it.

"In case of diseased meat," says Wylde, chief inspector of meat for London, "two characteristics are present, either emaciation with wetness of the flesh, very palid, with enlargement of the kidneys, or a red surface with dark, sticky flesh of velvety appearance, and the kidneys very dark and congested.

The flesh of healthy animals presents a bright cherry color, almost pink; the exterior of the carcass showing a purplish red with bloom resembling that of a plum; the ribs pink, the fat firm, having creamy white, or very pale straw color; the flesh also having a marbly tracing of fat; when felt with the finger on the surface it will be found to contain good, juicy, nutritious qualities. In young animals all the joints, when dissected, have a bluish tint."

Dr. Victor Vaughan, professor of the University of Michigan, says:

Good beef has a reddish, brown color, and contains no clots of blood. Beef of pale pink color indicates that the animal was diseased. Beef of dark purple hue indicates that the animal was not slaughtered, but died with the blood in its body, or has suffered from some febrile affection.

Good beef has little or no odor.

Good meat is elastic to the touch. If wet and flabby discard it. It should not become gelatinous, (resembling jelly), after kept in a cool place for two days.

It having been shown that the flesh of diseased animals gives disease to human beings who consume it, the question arises whether or not it is better to prevent the disease, by protecting against the sale and use of such meat, or to cure those who become diseased, and not only from a sanitary standpoint, but from that of economy, as a commonwealth.

Iowa is a meat-producing State. The trade in diseased cattle is opposed to her prosperity in that regard. The traffic in diseased meat conduces to human diseases. The protection of the public health is one of the most important duties of a government. In most of the countries of Europe laws have been long in existence controlling the sale of food, general in nature, under which municipal governments have supplemented local regulations for inspection. In our own country several States have statutes bearing upon the subject, by which the subject is turned over to State and local boards of health. There is upon the statutes of Iowa a law to prevent the adulteration of food, faulty in its provisions, and worthless, in that it makes no provision for its enforcement. Some means should be provided for inspection, and in the case of meat, it should be done by a competent person, before death and before the meat is offered for sale in the market. There should also be provided methods for the surveillance of all slaughter houses.

ALUM AND AMMONIA IN BREAD.

It is a well demonstrated fact that much of the flour used, and bread purchased of bakers, contains alum. It is used by bakers in the manufacture of bread to increase the whiteness of the flour. By the use of alum a very bad flour may be made into very white loaves. This opens the door to fraud and unequaled competition. The unscrupulous baker, by the use of alum, is enabled to make from inferior flour as white a loaf as his competitor from the best flour. This mixture is used under the name of "Stuff," which is

alum mixed with common salt, prepared to disguise the nature of the compound. The usual proportion is one part alum to three parts salt.

The presence of alum in baking powders is simply to whiten the flour.

The presence of alum in any quantity sufficient to affect the flour, is injurious. Hassall says:

> The use of alum in bread is particularly injurious. It is true it causes the bread to be whiter than it would be otherwise; indeed whiter than was ever intended to be by nature; but it imparts to bread several other properties; thus it hardens the nutritious constituent of the bread, the gluten, and so, on the authority of that great chemist Liebig, renders the bread more indigestible; it enables the baker to adulterate his bread with greater quantities of potatoes and rice than he could otherwise employ; and lastly he is enabled to pass off an inferior, and even a damaged flour, for one of superior quality.
>
> The public in judging of the quality of bread by its color—by its whiteness commits a serious mistake; there is little or no connection and quality—in fact, very generally, the whitest bread is the most adulterated. Alum is very apt to disorder the stomach and to occasion dyspepsia.

Dr. Gibbon, of London, says:

> I have no hesitation in assigning this use of alum in bread as the chief cause of the frequent constipation, headaches, liver derangements, etc., of those who are dependent on bakers for their bread.

Regarding alum in baking powders, Dr. J. H. Raymond, Sanitary Superintendent, of Brooklyn, New York, in his report to the Board of Health, says:

> The effect of alum in baking powders is, beyond doubt, injurious.

S. W. Johnson, Professor of Chemistry at Yale College, says:

> Bread made with a baking powder containing alum must yield a soluble alumina salt with the gastric juice, and must therefore act as a poison. The manufacture and sale of such poisons ought to be interdicted with heavy penalties.

Henry A. Mott, Jr., Phd. E. M., the well known expert chemist, after thorough experiment with sixteen dogs, in New York, by feeding them biscuit made with alum baking powders, says:

> In every case where biscuits made with less than seven times the quantity of alum the baker usually employed, were given to a dog; the dog vomited profusely, and was made very sick.

Alum and Ammonia in Bread.

The eccentric English author of the little book "Death in the Pot," who signs himself "An Enemy to Fraud and Villainy," says:

> By the use of these ingredients (alum and spirits of vitriol) in bread, tens of thousands of children under three years of age are annually consigned to the grave in this "happy" country.

The logical deduction from this testimony, which might be increased a hundred fold, is, that all baking powder not known to be free from alum should be absolutely discarded from the household.

To detect alum in bread the following is a simple method, and is said to be reliable:

> Soak in three or four tablespoonfuls of water a half slice of bread, strain off the water and add to it twenty drops of a strong decoction of logwood. Then add a large teaspoonful of a strong solution of carbonate of ammonium. If alum be present, the mixture will be changed from pink to a lavender-blue. This test will discover a grain of alum in a pound of bread.

Alum powder can be tested by putting a couple of teaspoonfuls of the powder in a glass of cold water. If no effervescence, that is, bubbling or simmering, takes place, condemn the powder and return it at once.

Some alum powders, however, contain phosphates in combination with alum, and with these brands the following test is simple and sure:

Take one-half teaspoonful of baking powder in lid of say half-pound can; char thoroughly over a strong alcohol flame, a good gas jet, or red hot coals. After charring (that is burning till the whole mass is black) add a teaspoonful of water and place a bright piece of silver coin in the solution. Stir for one minute, then take out the silver. If the powder prove a cream of tartar powder the coin will be bright; if an alum powder it will have sulphur stains.

Now pour a little vinegar into the lid and smell the fumes. Alum powders give off sulphuretted hydrogen, which may be detected by its foul odor resembling that of a spoiled egg.

The adulteration of flour with alum is prohibited in this State; it ought to be in baking powders.

The general opposition to the use of alum in baking powders, has induced manufacturers to resort to other expedients, and we

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find, in some powders, the carbonate of ammonia, it being claimed that it has the desired leavening properties, and yet becomes completely volatalized and passes off in the process of baking. At a recent meeting of the American Chemical Society, the hygienic quality of preparations for leavening bread was considered. Among them was that of carbonate of ammonia. Dr. Enderman, an eminent chemist, presented a paper giving the result of a series of experiments made in bread baking, using the various baking powders found in the market, and with carbonate of ammonia alone. With the latter he used half a pound of flour, four grains of ammonium carbonate, salt and water to suit; baked seventy-eight minutes. Water from the bread gave a precipitate by boiling and the addition of acetic acid. Water extract of seven and five-tenths grains of bread distilled with soda; result: 1.5 cc., 1.5 normal acid found saturated with saturated by ammonia.

The Dr. says: "The argument of parties who use ammonia has been that during baking the ammonia is completely volatilized, and can therefore do no harm. It is true the literature abounds in statements to this effect, though all of these statements are simply opinions, and *not based upon actual experiments.* Those in favor of its use do not take into consideration the question of the medicinal nature of ammonia salts. On the other hand, all *actual investigators* have stated that the ammonia is not dissipated from the bread in baking; and the general explanation so far has been, that the ammonia carbonate at first dissociated at first by heat is, on cooling, re-condensed by the formation of ammonia bicarbonate, and thus stays in the bread. All those have found it necessary to consider the action of ammonia and its salts upon the human system. Chemistry shows:

1. The ammonia is retained by the gluten in chemical combination.

2. The gluten is, by reason of this combination, altered in its chemical properties."

This is the demonstration of the chemical degeneration of the gluten in bread by its permanent absorption of ammonia furtively conveyed in baking powders.

The *consensus* of the debate which followed the presentation of Dr. Enderman's new and important demonstration, by the medical

mem bers upon the effect of ammonia on the human system was in accord with Dr. Enderman, and the universal judgment against the use of ammonia in baking powder. That is, that ammonia is an excrement, and not a nutriment. It is a body which in the system may form urea by loss of water, while urea may again form ammonium carbonate by combination with water. But ammonia in quantity is found in blood or urine only in disease. The ammonia or its carbonate neutralizes the gastric juice, and therefore interferes with digestion. Van Hassett speaks of ammonia as a poison, and and of acute poisoning and chronic poisoning by ammonia. He defines chronic poisoning as follows: "Primitive chronic poisoning by ammonia may ensue from either too long continued use of carbonate ammonia or chloride of ammonium, or its use in too high medicinal doses."

The symptom is gastritis chronica, with secondary symptoms arising from the degeneration of the blood. Half a drachm of chloride of ammonia kills a rabbit within one hour, (Mitscherlich).

Prof. Geo. F. Barker, M. D., of the University of Pennsylvania, president of the Society, said in reply to another member who sought to apologize for the use of ammonia on the ground that only a small quantity was used in baking powder: "No matter how small the quantity, I must decline to be dosed medically without my consent when taking my meals."

E. H. Bartley, M. D., formerly chemist of the Brooklyn Board of Health, and a member of the Society, says: "As this drug is not wholly expelled from the dough in the baking process, and as most medical authorities agree as to the injurious effects resulting from continued use of ammonia, its use in bread should be strongly condemned."

Winslow Anderson, M. D., medical department of the University of California, says it is his opinion that the American disease of dyspepsia is due to the use of baking powders containing ammonia and other adulterants.

The latest investigations regarding ammonia have been made by Prof. Pettenkofer, of Munich, well known by all medical men and scientists. He says. "Three parts of ammonia in ten thousand parts of air is, for unaccustomed human beings, the highest bearable quantity. The poisonous action of ammonia, like that of

carbon monoxide, is due to its action upon the nervous system, and especially upon the nerve centers."

To Detect Ammonia—Mix one heaping teaspoonful of baking powder with one teaspoonful of water in a tin cup; boil thoroughly for a few moments, stir to prevent burning, and if ammonia is present you can smell it in the rising steam. Or place a can of the suspected powder top down on a hot stove for a minute or two, then take off the cover and smell.

DANGEROUS DRIED FRUIT.

The American Public Health Association has issued a bulletin warning the people against the use of fruit dried or bleached by what is known as the "sulphuring process." The practice is unqestionably criminal and ought to land the perpetrators in the penitentiary. Housewives have become familiar with the "nice white dried fruit" to be found in grocery stores, put up in boxes. The housewife should let it severely alone.

At the last meeting of the American Public Health Association, Dr. Joel W. Smith, of Charles City, presented a paper upon this subject which is given in full:

The subject of this paper should command the careful attention of consumers of dried fruit, of conscientious fruit dealers, and of all health authorities. Fruit is now regarded more as a necessity than as a luxury, the want of it being a common cause of ill health.

As fresh fruit is not always obtainable, various methods for preserving it are in use, drying being one of the oldest and best for many fruits. Middle-aged people recollect when sun or air drying was the only method for market. Then some good housewife discovered that more rapid drying by artificial heat, with or without the addition of sugar, was a cleaner method, safer against fermentation and decay, retained the flavor better, and the fruit was also lighter colored, than when sun or air dried. The present evaporators are only an enlargement of the idea of such more rapid drying, while canning consists in the exclusion of the microorganic germs of fermentation.

This is an age of progress, yet experience often shows that not all changes are improvements. It is about fifteen years since the sulphuring or bleaching of dried fruit began. At first only the uniform light color was sought,

as in apples, pears, etc., but for some years past nearly all the large evaporating establishments have "sulphured" all kinds of fruits and some vegetables, and now much of the California sun-dried fruit for market is treated in the same manner. The light color, especially of apples, early attracted unthinking consumers and commercial men, thus materially increasing the price of such fruit. That caused the practice to spread even to those who disapproved of it. The expense and trouble were very slight. Fruit so treated is said to dry more readily, consequently all now prefer to do it.

While the apparent change is only in color, there is a loss of the natural fruit flavor, even by the most careful sulphuring. Unfortunately, some people do not notice the difference, but careful comparison shows it, as is admitted by the manufacturers of such fruit.

The practice began in California, with apricots, as early as 1879. At the Twelfth State Fruit Growers' Convention, held in Fresno during four days in November, 1889, a paper on "Fruit Drying" was read by J. L. Mosher, of San Jose, and in his paper he remarked,—"If fruit be picked before ripe and over-sulphured to produce whiteness, it is devoid of its true rich taste and flavor, and *only requires polishing to make buttons.*" (The italics are his.) In discussing the paper, one gentleman said,—"I believe sulphuring the fruit is the greatest mistake in the world. I do it, but I believe it is wrong; the flavor of the fruit is gone after it is sulphured."

This change in quality was the first thing that called the attention of the writer's family to what was lacking in the "nice, uniformly colored" bleached fruits.

Later investigations have proved the presence of sulphate of zinc, "white vitriol," in all samples of fruit where zinc-surfaced trays were used to hold sulphured fruit while drying. Interested parties have charged the German prohibition of American evaporated apples to rival trade opposition, but there is no German fruit to compete with them. The real cause was the finding of zinc poison in considerable quantity. A good paternal government aims to protect its people.

WHY SULPHUR FRUIT AT ALL?

The advocates of sulphuring fruit say,—(1) It dries quicker, (2) looks better, (3) keeps better, and (4) sells better. Beside, it makes ripe, unripe and poor fruit all look alike; and if not so good for it, but few know it.

Sulphurous acid is formed by burning sulphur, and is readily absorbed by water. It abstracts oxygen from many vegetable substances and thereby bleaches them. It also tends to prevent microscopic organization that causes fermentation. The acid in liquid form is colorless, very cheap and smells like burning sulphur; is antiseptic, a preservative fluid for some substances, sample fruits, etc. Sulphur is often burned to disinfect sick-rooms of disease germs and to kill rats, mice and vermin, but its use with food is objectionable. Ants and other insects, it is said, will not touch sulphured fruit, while they readily attack well ripened fruit that is not sulphured. The instinct of insects and animals is sometimes better than the practice of human beings. In general, substances that repel such creatures are hardly safe for human food.

THE EFFECT ON CONSUMPTION

has seemed to be a decided falling off in demand among the more intelligent class of people. Retail grocers know that many who once used dried fruit extensively say, "Somehow we have lost our relish for it," and have almost ceased to use it since the craze for sulphuring fruits began. Fruit men say, "The public demands sulphured fruit, will pay more for it, and we will supply it." The public will yet show them that it can get its eyes open. As the green and canned fruit interests are the only permanent gainers by the sulphuring process, they are interested to have it continued.

DIFFICULT TO OBTAIN.

It is not easy to obtain a superior quality of unbleached fruit. In 1889 several retail grocers who understood the question corresponded with parties evaporating apples. The reply was, that "if an order for not less than twenty barrels was received at one time, apples would be furnished unbleached, otherwise not."

SULPHURING NOT DESIRABLE.

The slightly yellowish-brown color of unbleached dried fruit is an evidence of ripeness, good quality and proper drying. The more rapid the drying the lighter will be the color and the fruit will keep well if at once properly excluded from the air. When sulphured, the good, the poor and the unripe all look alike. Not so with the unbleached. No poor nor unripe fruit can make good dried fruit. The gain of sulphuring is always with the dealer, and not with the consumer.

HEALTH AGAINST LOOKS.

In preferring looks to quality the people are often at fault. Public enlightenment will correct most dietetic errors. Good health is now sought by many, and will be by more in the near future, through correct living, rather than by the swallowing of drugs. And in that more excellent way, "in the good time coming," there will be no demand for sulphured and other drugged fruit among intelligent people.

DANGERS.

There is danger from fruit in metal cans, as is well known, and fresh fruit is frequently unobtainable, while both are often more expensive than dried fruits. Good unsophisticated dried fruits are always harmless. If green fruits are at times unobtainable, canned fruits dangerous, and a popular craze has rendered dried fruits also dangerous, what can the suffering public do? It is between the alternatives of using no fruit or that which is injured or poisonous. Is the sulphuring of fruit a mistake or a crime?

TO CORRECT THE ERROR,

enlighten the people and prohibit injurious practices. Legal suasion only will stop it at present. The common schools in many States are required to teach the effects of alcohol and narcotics. Why not also include the effects of different foods?

ICE CREAM POISONING—TYROTOXICON.

On the fourth day of July, 1889, a most extensive outbreak of ice cream poisoning occurred at Adair, and was reported by Dr. Thomas D. Lougher. There were in all nearly one hundred and twenty cases. Some were very severe and well-nigh proved fatal, though all finally recovered. The symptoms were more or less uniform, differing mainly in severity and were those of irritation of the stomach and bowels, followed by more or less prostration. The cream was flavored with extract of vanilla.

Several samples of the cream and a sample of the vanilla were furnished Dr. Robert McNutt, chemist, of this city. An examination of the vanilla gave only negative results. Large doses taken by him produced no unpleasant effects. A careful examination of the samples of cream after Vaughan's methods, resulted in finding tyrotoxicon present to a large extent, which was reduced to a fine crystaline form.

This tyrotoxicon is a ptomaine, and is the result of decomposition, or fermentative process set up in the milk. It may be produced by any and all those causes that lead to the decomposition of milk, by the introduction of a specific microbe, such as uncleanliness, impure water, keeping the milk in mouldy and unhealthy positions, and hauling milk for long distances in the hot sun. It is supposed by many that the "milk sickness" so prevalent in some sections of the country is the result of tyrotoxicon poisoning. Unquestionably many cases of cholera infantum that occur everywhere among children "raised by hand," and especially attempted to be raised on the bottle with the rubber tube attachment, are nothing more nor less than cases of tyrotoxicon poisoning.

In January 1891, two pieces of cheese were received from Dr. Reynolds, at Centerville, with a statement that both were from the same invoice, made at the same factory, and at the same time. The cheese from which sample marked "No. 1" was taken was eaten of by twenty persons, all of whom were soon after affected with all the symptoms of tyrotoxicon poisoning. Of sample No. 2 none was eaten.

The samples were given to Prof. Floyd Davis, chemist of the State Board, who, after a careful analysis for tyrotoxicon after Vaughan's method, reported that in sample No. 1 there was distinct reaction for that ptomaine, but in sample No. 2 there was none, and it was free from ptomaines.

June 2, 1890, Dr. A. D. Bundy, of Mitchell county, reported that he purchased on May 31st a cheese at one of the groceries. At supper he with two other adults ate of the cheese, and in about six hours all were taken with violent pains in the bowels, diarrhœa, nausea, and vomiting, which continued for twenty-four hours. Recovery was had in three or four days. Several other families in the same county purchased, the same week, cheese made at the same time and place as that purchased by Dr. Bundy, and all—over forty persons, were sick with the same symptoms.

THE ICE-CREAM FREEZER A SOURCE OF DANGER.

Dr. George S. Hull, Ph. G., of Chambersburg, Pa., reports several cases of poisoning from ice-cream, which could not be explained upon the tyrotoxicon theory. He turned his attention to the freezer, and after four years of experimentation and observation he gives his conclusion in the *Medical News* of June 27, 1891. He says:

The modern ice-cream freezer is in reality but a form of galvanic cell, the only difference being that in the cell the current is utilized and the poisonous solution of zinc thrown away, while the current is wasted and the toxic metallic solution is eaten. The freezer may be described as an iron paddle coated with zinc, resting upon an iron bottom coated with the same metal and surrounded with a zinc-coated iron case. If we put in an acid solution a strip of zinc and one of tin, and connect them by a wire which runs through a galvanometer, at once the needle is deflected, which shows that the zinc is being consumed by the acid; so, if we take a tinned can and a zinc-coated paddle in the modern freezer, and instead of letting them be in contact at the bottom, lift the paddle a trifle and make the contact above

by means of a wire—in order for the purpose of the test to get the galvanometer in the circuit—we shall find that on putting into the can even the purest and simplest ice cream mixture, (cream, sugar and flavor), there is a deviation of the needle in our galvanometer, telling us that a current is passing, and that it comes from the chemical action between the ice cream and the zinc, or in other words, that, however slowly, the poisonous metal is dissolving. Briefly then, this is what occurs: the zinc, or positive element, is acted upon by the fluid and a current generated, which passes across the cream to the tin or vegetable element, then up the wire through the galvanometer and back to the zinc, completing the circuit. The longer the zinc is in the freezer the greater will be the amount dissolved, the rapidity of the solution being directly dependent upon the character of the mixture in the can.

Let me summarize a large number of experiments by saying that while pure, sweet cream in the modern freezer deflected the needle of the moderately sensitive galvanometer but 7°, the cream, when sour, swung the needle violently to 90° (*i. e.* to a right angle to the current). Pure milk registered 40°, and when sugar and corn starch were added 45°, when eggs were incorporated the needle moved to 80°. None of the formulas for ice cream mixtures failed to show *some deflection*, proving that *all* of them were capable of acting in some degree upon the zinc. When any of these mixtures became sour, or when acid fruits were added, the needle turned rapidly to 90°. If by any chance salt finds its way into the cream, the deflection is greatly increased on account of the zinc being more rapidly dissolved by the active sodium chloride. The resulting zinc chloride renders the ice cream so much more poisonous.

The modern ice cream freezer is a galvanic cell in closed circuit. We have only to put into the freezer some ice cream mixture as an electrolyte, in order to get a metallic decomposition and solution, which is proved by the current generated; the amount of poisonous metal dissolved depends upon the character of the mixture used. In the modern freezer, provided it has been previously well cleaned, and that the paddle has been removed so soon as the mixture is frozen, the zinc dissolved will hardly be sufficient to produce symptoms of poisoning even in a large consumer, and yet we know that many people with sensitive digestive organs find ice cream very frequently disagrees with them. But if the cream is prepared, say for a picnic which is to start early the next day, and if the paddle is left in place all night so as to re-freeze it in the morning, should it have softened through the night, and especially if the mixture is a cheap one, as is often the case, made of milk, eggs, corn starch, etc., then we have a first-rate galvanic cell, with its zinc and tin, or in some cases, copper elements. The electric action of the whole may be heightened by the presence of some salt, by accident or design. The result will be, the current flows all night.

We might sum up the result as follows:

1. If we desire the least quantity of metallic poison we should see that the ingredients are pure, the mixture is frozen quickly, and the paddle removed at once.

2. The amount of poisonous salts is increased by acid mixtures, especially by the addition of eggs, corn starch, etc. The addition of salt for flavoring purposes, becomes criminal, and it is grossly careless to allow any of the salt water from the outside to get into the can. If, through fermentation, ice cream should contain tyrotoxicon, then the mixture must be acid, and will, on this account, dissolve more zinc or copper.

3. The amount of dissolved metal depends upon the length of time the paddle is left in the can, and the cream remains in the can.

ICE.

The purity of water for potable use, is admitted by all sanitarians essential to the health of communities. It is especially important that ice used for domestic purposes, should be free from contamination, since it is largely used, not only for freezing food, but for cooling drink. The sources from which ice is taken are usually in the vicinity of cities and towns, and hence are liable to, and frequently are polluted by factories, sewers and surface drainage. As a rule, it may be said, that no ice is fit for use that is formed from water unfit for potable use. It was formerly the universal opinion that in the process of freezing all impurities were destroyed. It has been demonstrated beyond question or dispute that such is not the fact, but that some of the most dangerous impurities survive the freezing, and reappear in the melted ice—in fact, it has been demonstrated that ice may contain a larger portion of organic matter than the water from which it is formed.

Prof. Raphæl Pumpelly, of the United States Geological Survey Bureau, says:

1. Water in freezing frees itself from substances which in solution with it give a fluid of greater specific gravity than water alone; but it still retains even of these, more or less entangled in the ice. Substances floating in suspension are entangled in the ice, and to this the microscopic low forms of life, among which are the infectious germs, form no exceptions.

2. Ordinary organic impurities are merely preserved from putrefaction during the period of their existence in a frozen condition. Freezing is only a temporary arresting of the processes of decomposition, and these are resumed when the requisite temperature is again attained.

With regard to the effect of freezing on the specific character of these low forms of life (the germs of infectious disease), we know that as germs they

Ice.

withstand a pretty good baking and freezing; but I think it is not yet settled whether they lose their infectious character.

It seems to me that greater care would be necessary in maintaining the purity of ice than of ordinary drinking water for the following reasons, viz.:

While during the warmer season, the dead, organic matter carried into streams and ponds is decomposed rapidly, or used up in nourishing plant and animal life; during the cold weather it tends to accumulate, and owing to its lightness, it may well happen that the ice in forming, may entangle so much of it, and of bacteria germs (those of infectious disease), as to render the ice much more contaminated than a corresponding amount of drinking water from the same source.

Experiments prove that sand in a column one hundred feet long, possesses absolutely no power to retain germs, and there is no doubt that what is true of one hundred feet is true of ten thousand feet.

The conclusions that may be drawn from the evidence we have now obtained are:

1. That while the inorganic impurities in water (mineral salts, and the like) which are those ordinarly detected by chemical analysis, may be partially eliminated, through their specific gravity, the purification remains at the best but partial and imperfect.

2. That the even more dangerous organic impurities resulting from human and other animal waste, are retained in the ice unchanged as regards both quantity and quality, the quantity being likely to be increased.

3. That the germs of infectious diseases are retained in ice unaffected and from their comparative lightness are so concentrated therein as to number, that they exist in even greater quantity than in the same amount of water under similar circumstances at other seasons of the year.

4. That ordinary organic impurities thus retained in ice are likely, though there be no technically infectious disease in the neighborhood, to produce serious, and even dangerous illness in those persons who may use the ice in question for domestic purposes. This was positively proved at Rye Beach."

Col. Geo. E. Waring, the eminent sanitary engineer says:

1. Water containing the germs of typhoid fever does not free itself from such germs by congelation. This, I think, is well established.

2. Ordinary organic impurities, if uniformly diffused through the water, are involved among the crystals of ice, and appear in the water after the ice melts, in all respects unchanged. This is also clearly established.

Prof. A. H. Nichols of the Massachusetts School of Technology, says:

The notion that ice purifies itself by freezing is not based upon trustworthy scientific observations. On the contrary, it is utterly wrong in principle to take ice for consumption from any pond the water of which is so fouled as to be unfit for drinking purposes.

Dr. H. R. Storer, of the Sanitary Protective Association, says:

Ice.

Ice unfit for ordinary domestic use, ought to be also unfit for butchers, even if only employed so that there is no direct contact with the meat.

Dr. Wm. B. Hillis, of Harvard Medical College chemical laboratory, after making an analysis of water from melted ice taken from Almy's pond, and which caused sickness in the noted case at a Rye Beach, N. H., hotel in 1875, wherein twenty-six persons out of the five hundred guests were rendered seriously ill, and which was traced directly to the ice, says:

I do not consider it proper to take ice for consumption from a pond, the water of which is unfit for drinking purposes. It is a fact known to all scientists that ice does not completely purify itself by freezing.

Dr. Pumpelly, as chairman of the committee to examine the water and ice in the Rye Beach hotel case, reported that the committee found that beside a certain amount of agricultural drainage, the pond received the local seepage from a number of barn-yards and privies, and also the direct overflow from a number of cess-pools. That—

* * * * * * * *

The whole weight of evidence of modern investigation is in favor of a close genitic relationship between the presence of certain low forms of vegetable life, and the epidemic prevalence of many diseases, both mild and fatal kinds.

This evidence shows very conclusively that the germs of these forms, which have produced or accompanied the disease in the human body, retain their capacity for infection after having been excreted.

It becomes then, important to know whether the germs can retain their vitality and specific adaptability for infection after having passed into the conditions of varying temperature, moisture and dryness.

Experiments made by Pasteur and other biologists prove that while the adult forms of bacteria are killed by the variations of a few degrees of temperature, their germs will often withstand a temperature of boiling water on the one hand, and many degrees below freezing on the other. Under the conditions of moisture and nourishment they develop rapidly succeeding generations; while on the other hand, they remain in a dried condition for many years, to be again brought into activity when subjected to moisture.

There is little doubt, therefore, that when they accompany sewage matter they go wherever this goes, excepting where the sewage frees itself from impurities by percolation through a filtering system.

Experiments made have proved conclusively that even extremely fine sand possesses no filtering capacity for the germs of these low forms of life, and that most soils possess such filtering powers only to a slight extent.

Ice.

Thus in nearly all cases these germs must accompany the water from the beginning of its journey, from the cesspool to its end in the stream or pond, excepting where taken up to sustain plant life.

At Rye Beach, N. H., a famous summer resort, there broke out in the Summer of 1875, among the inmates of a large hotel, an epidemic of intestinal trouble which baffled all effort by the local physician to ascertain the cause. Dr. A. H. Nichols, of Boston, was employed to make an investigation. After tracing the environments of the hotel drainage, and the food without sufficient foundation for cause, suspicion was directed to the ice furnished the hotel, and it was found that the sick were in the habit of using this ice. The use of the ice was suspended and the sickness at once abated. An investigation of the ice and the water in the pond from which the ice was taken showed that the ice was impure, containing numerous substances of vegetable origin, and that the water was a homogeneous mass of putrescent matter composed of marsh mud and decomposing saw dust.

The Committee on Pollution of Water Supplies, appointed by the American Public Health Association, in 1888, says:

The relation between the distribution of a water which contains sewage, and the prevalence of typhoid fever, can be readily observed by any one who studies the mortality returns in connection with the character of their water supply.

Organic matters that are endowed with vitality remain uninfluenced by the destructive and reconstructive bacterial agencies that are operating in the water; and these are the matters from which most is to be feared if sewage has unfortunately had access to the supply. The infected water which prostrated twelve hundred of the eight thousand inhabitants of Plymouth, Pa., and killed one hundred and thirty of those whom it prostrated, passed through three storage reservoirs on its way to accomplish its deadly mission. The fæces of a typhoid fever patient far up on the mountain side were thrown out in Winter upon the bank of a small stream, which ran into the public storage reservoirs at Plymouth. In the following Spring when the snow and ice melted, the dejecta found its way into the brook and thence into the reservoirs.

The decay of once living organisms, animal or vegetable, gives more or less taint of a putrefactive nature to the surface waters of the earth, and this taint, when of sufficient strength, is known to induce diarrhœal tendencies in the human system. Moreover among the fermentations which take place during the destruction of organic matter, is one which gives origin to an influence—the malarial—which is always disabling, and often deadly to human life.

Ice.

A water to which sewage has access should from that fact alone be excluded from all consideration as a possible water supply for drinking purposes.

The germ of disease may not be in this pitcherful or that; in this tumblerful or in that, but it will find us some day, if we continue to use the water which contains it.

Thirty thousand people die of typhoid fever annually in the United States. Calculate the loss of work, the unprofitable work of nursing, and the actual outlay necessitated by each visitation of the disease.

The protection of the citizen in his constitutional right to enjoy life requires that every advantage be taken of our knowledge of the natural history of the typhoid infection, that it may be destroyed before reaching our water courses. This infection passes from the patient to our surface waters directly by the sewers, or it drains through the soil with the sub-soil water, and reaches the surface in some lower level. Of course it may be lost in the mass of water in which it is diffused, but it was not so lost at Plymouth, nor at Laussen. (See page 50).

Dr. Robert Kedzie reports an epidemic of diarrhœa from drinking melted ice taken from streams containing rotten sawdust, in Michigan.

Dr. Chamberlain in the Report of the Connecticut State Board of Health, records a fatal case of typhoid fever due to the use of ice from a pond into which the dejecta of a person sick with that disease had been thrown. He also records an instance of typho-malarial fever in a family of seven persons, three of whom died, caused by using ice taken from a shallow stream where hogs had wallowed the previous Summer.

Similar instances might be cited *ad libitum*, but sufficient has been given to show the danger of using ice from suspicious sources; that the use of ice cut from streams, ponds or lakes, polluted by sewage or organic refuse of any kind is dangerous to health.

It is clearly the duty of the legislature to provide measures to protect the streams and lakes of the State against all possible sources of pollution, and some means for regulating the securing and use of ice for domestic purposes.

In Massachusetts no sewage, drainage, excrement, or other refuse or polluting matter of such kind or amount as—either by itself or in connection with other matter—will corrupt or impair the purity of a water used for domestic purposes, is permitted to be delivered into a water-course or any of its feeders within twenty miles above

the point where a water supply is taken. No horse can be driven upon a field of ice that is to be used for domestic purposes.

In New Jersey no ice can be cut within the limits of any city from any stream or pond, nor can ice be sold in any city, without a permit be first obtained from the local board of health.

ARSENIC IN WALL PAPER.

A few years ago, so thoroughly aroused became health boards in this country and Europe upon the outrageous use of arsenic in coloring wall paper that manufacturers ceased to use it, but recent investigation indicates that they have again returned to its use.

Dr. F. C. Robinson, a member of the Maine State Board of Health, and Professor of Chemistry, Bowdoin College, made a preliminary report recently to the State Board of Health of Maine. He gave the result of the examination of over one hundred samples of wall paper which he found in the stores of wall paper dealers in that State. While several contained traces of arsenic, he found three patterns that were highly dangerous. One paper which he found in use on rooms in two houses was the cause of serious sickness of two children occupying the room. This was a landscape paper and attractive to children—a paper imported from England. It represented a grape scene with green leaves and vines, purple clusters of grapes and workers dressed in gaudy clothing. There were found in this paper by careful analysis one hundred and sixty-eight grains of arsenious acid, or one hundred and twenty-five grains of pure arsenic in every square yard! Since two grains may be considered a fatal dose for an adult we have here a paper with enough arsenic to each square yard to kill over sixty men! The doctor found that the arsenic was not confined to the green parts, but was also present in the drab, blue and purple tints. This paper, when rubbed, as it always must be more or less when on the walls, is constantly parting with more or less of its arsenic. The chemist secured a small particle of dust from under the carpet in one of the rooms covered with this paper. Examinations readily revealed the presence of arsenic.

The question may be asked whether we cannot readily, or at least safely judge of the character of any sample of wall paper by its color. Dr. Wood in his report to the Massachusetts State Board of Health says: "There is absolutely nothing in the appearance of a paper by which we can form any opinion as to its arsenical or non-arsenical nature," and Dr. D. H. Galloway in a report recently to the American Pharmaceutical Association says: "I am convinced that it is impossible to say before examination whether a given sample contains arsenic or not."

Dr. Robinson says his own experience accords with the above statements in general, but he believes "the darker colored papers are the greatest sinners in this respect." He says, whether accidental or not, he found no arsenic in light colored papers, and in those examined by Dr. Wood all that contained arsenic, except two, were dark colored. It might be well to state here some of the symptoms produced by arsenical poisoning in this manner.

Robinson says of the children who slept in the room with the "landscape" paper on the walls that they lost flesh, grew pale, and had attacks of sick headache, had what they called bad dreams, restlessness at night. One had a "cold sore" on his upper lip which refused to heal while kept in the room, which healed rapidly when the room was repapered. The mother who used the room as a sewing room occasionally complained of a depressed feeling and sleeplessness, and the doctor says he has no doubt the children would have been fatally poisoned if they had remained in the room. He believes that papers containing a small fraction of a grain per square yard should be discarded because they may be injurious. The colors of wall papers are loose. Rub your hand over them and the colors will rub off. In brushing the walls the colors fly off in fine dust which settles everywhere, even under the carpet. Some one or more of its gaseous compounds is undoubtedly formed, if the room is damp, so that the underlying paste becomes mouldy, to be absorbed in the system, especially if the person be physically enfeebled. Cases of this kind have been repeatedly recorded, and doubtless many cases of mysterious sickness, with indications of slow poison, which have baffled medical skill, could be traced to this altogether unsuspected cause.

Inasmuch as many foreign nations prohibit the use of arsenic beyond the merest trace in wall paper, the only safe way would be for the United States through its various State legislatures to take similar action. Either that should be done, or the people should teach manufacturers of wall paper that such paper will not be purchased. People who can afford it, and the cost perhaps would be little if any greater, should paint their walls, as thereby æsthetic as well as sanitary results may be obtained. Those who cannot afford paint would get clean and more healthful walls by the use, twice a year, of the old fashioned whitewash, with enough of milk or salt added to prevent its coming off.

Anything or nothing on the walls would in the long run be cheaper than paper poisoned with arsenic.

The presence of arsenic in paper may be detected by putting a small piece of the paper into strong ammonium water. If arsenic be present, a bluish color will be developed. As copper gives a similar color, as a further test, moisten a crystal of nitrate of silver with a drop of the water. If the color be due to arsenic, a yellowish deposit will be formed.

INTRAMURAL CEMETERIES.

What to do with our dead, is becoming a serious question. It concerns the survivors only. It is important not only to the present, but to posterity. We know that when the heart ceases to beat, from that moment putrifaction begins. This process may extend for a hundred years, according to the conditions surrounding the body, as to soil, seasons, temperature and moisture. Every particle of matter surrounding the decomposing body becomes saturated with germs of disease and death.

The final disposition of the dead, therefore, is demanding the best and most earnest thought of sanitarians the world over. One point has been well settled. The dead should not be buried among the living. There is a turning back to the ancient rule of the "Twelve Tables," A. D., 200.

The Jews buried their dead without their cities.

The body of the son of the widow of Nain was met by Jesus when being carried out of the city.

Outside of Rome the Patricians gave large tracts of land for burial purposes.

The danger from intramural burial lies in the possible and highly probable contamination of the air and water.

The burial of a body dead from a zymotic disease is the planting of seed, for posterity, which is sure to bring forth a crop of pestilence and death.

The nearer the abiding places of the dead and the living the greater the probability of poison from disease germs.

Pasteur, who is known the world over, says: "We hear of microscopic germs, starting from the depths and coming up to the surface—that is to say, in a direction contrary to the flow of the rain. The earth-worms transport the germs and bring up from where they lie buried, the terrible microbes. It is absolutely proved that these germs exist in the excrementitious cylinders deposited by the earth-worms. Disintegrated by rains, their dust spreads over the grass, and animals become infested from eating the grass. What outlooks are opened to the mind in regard to the possible influence of earth-worms in the etiology of disease, and the possible danger of the earth of cemeteries."

Dr. Charles Caldwell in a series of letters to students of the University of Pennsylvania, one of the oldest and best institutions in America, says: "Yellow fever is the offspring of putrifaction. It is a maxim to which there is no exception, that neither the yellow fever of America, nor the plague of the East has ever been epidemic in any place where the atmosphere was not loaded with putrid exhalations. In no instance is there a greater want of wisdom than in suffering these repositories of dead bodies to continue in the city; and in no instance is the wisdom of former ages more worthy of imitation than in having living and dead cities, the latter without the walls of the former for the interment of the dead."

Before the Ohio Medical Society, in 1888, Dr. L. Slusser, of Canton, gave the history of a well on his own premises, which became so polluted from a cemetery located near it, several years after it was dug, that it had to be abandoned because of so much sickness in his family by it.

Intramural Cemeteries.

Before the American Public Health Association—which is the great sanitary organization of North America—at Washington, in 1885, Dr. John Morris, of Baltimore, said: "The medical journals of the year contain reports of out-breaks of typhoid fever from using water polluted by drainage from grave-yards. The contamination of water is often caused by too close proximity of burial grounds to wells and rivers."

At the Social Science Congress, at Manchester, England, in 1879, the bishop of Manchester said: "Cemeteries are becoming dangerous, not only from inhalation of the effluvia from the graves, but from the pollution of the wells and water supplies."

Dr. Stephen Wicks, in his book on "Sepulture," after quoting several pages of facts from records of epidemics, says: "The conclusions which appear to be firmly established by the evidence and the preponderant medical testimony are on every point as to the essential character of the physical evils connected with the practice of interment, so closely coincident with conclusions deduced on the continent that they may be stated thus: The injurious effect of exhalations from the decomposition in question (of burial) upon the life and health is proved by a sufficient number of trustworthy facts."

Before the Congress of Medical Science, at Copenhagen in 1884, Dr. Levison, one of the most noted physicians and scientists of Denmark, said, of the effect of cemeteries, after a protracted and personal examination: "On many occasions the origin of pestilential diseases has been traced to the use of water from streams or wells which have been contaminated by the presence of cadaveric decomposition. Several epidemics of cholera have been traced directly to the presence of cemeteries near streams that supply water to the people. As many as four thousand bacteria were found in every cubic centimetre of water, beside ammonia, nitrates, sulphuretted and carburretted hydrogen. In seventy-eight county districts epidemics of typhoid fever were traced to the cemeteries, and churches and schools in proximity to them had to be closed because of the prevalence of typhoid fever for many years in them."

In "Dangers to Health," Dr. T. Prigden Teal, surgeon to the General Infirmary at Leeds, England, gives, with an engraved

Intramural Cemeteries.

illustration, the case of the vicarage at Ilkley rendered so contaminated throughout by filteration from a grave-yard situated on a hillside above it that had to be abandoned by the vicar.

The report of the New Jersey Board of Health for 1885 sums up the report of the several towns in the State on the condition of their cemeteries thus: "These various facts as to grave-yards and cemeteries make it certain that water is polluted from them, and that the air is fouled by exhalations from them." If these are the conclusions, the facts upon which they were predicated must have been positive that cemeteries are not healthy.

In 1883 George Buchanan, President of the Epidemiological Society, composed of the most noted physicians in London, and president of the Local Government Board of England, said before that society: "We in England do believe that cholera extends much after the fashion with which we are familiar in the case of enteric (typhoid) fever, by the admission of the dejecta of the victims into the drinking water."

He is confirmed by Dr. Ph. Hauser, member of the Academy of Medicine of Spain, in his report on the transmission of cholera by water, to the International Congress of Hygiene, at Vienna, in 1887, where was gathered together the most eminent and learned sanitarians, scientists and medical scholars in the world. Dr. Hauser presented his report on the transmission of cholera by water, evidenced by his investigation of the cholera epidemic in Spain in 1884–5, in which he cited two thousand two hundred and forty-seven localities examined. Pettenkofer, the grand and mighty scientist, who agrees with Pasteur in that disease germs or microbes work through the soil upward, thence being distributed through water and air, was present, and intently listened. Dr. Hauser summed up his conclusion by saying, that from all the facts he had gathered, he had arrived at the conclusion that cholera uniformly prevailed along water courses where the soil was damp; that "all prophylactics, such as isolation of the sick, disinfection of houses and furniture, even the destruction of them, are perfectly useless to arrest an epidemic without the potable water is good, and the soil unfavorable to pathogenic micro-organisms."

Pettenkofer expressed surprise at the array of Dr. Hauser's facts, and said while he could not accept his theory he would admit what

is "accepted by all who have investigated the subject at all, that those localities suffer more from cholera, diphtheria and malarial diseases which lie nearest the level of the ground water."

One of the greatest dangers menacing every city and town in the State is their shallow wells. Dr. Holland says shallow wells are dangerous. Why? From surface drainage and soil percolation. Water in the soil follows the first impermeable stratum, and this impermeable stratum may or may not be parallel to the upper surface. Generally it is not. In this State the geological formation is such that the trend of the stratum is to the south and southwest. Water finds its way through the alluvial drift, seams and crevices. There are but few deep wells in this State—all are shallow wells. By locating a cemetery within a city, the water supply is endangered by increasing the possibilities of contamination by surface drainage, and by percolation. There will be buried bodies dead from typhoid fever, diphtheria, scarlet fever and all those diseases caused or conveyed by impure water. There will be deposited the victims of small-pox. The germs of small-pox and scarlet fever, it has been proven, retain their vitality fifty to eighty years. The bacillus of typhoid is so minute that fifty million can be spread on a nickel coin. Neither freezing nor soil filtration will destroy its vitality. The diffusibility of typhoid poison in water is indefinite. It has been traced for one mile, through underground filter. In Laussen, Switzerland, in 1872, about a mile from the town, a farmer came home from a long journey, and June 10 was attacked with typhoid fever. Between his farm and the town was a high ridge of Stockhalden mountains. In his farm house there were several other cases of the disease. On the 7th of August the disease broke out in the town, and in the first four weeks one hundred persons were sick. All the villagers except six families, who had a private well, got their water supply from a public fountain, carefully walled and protected from pollution, at the base of the Stockhalden ridge. The exemption of the six families from sickness led to an investigation. It was found a brook ran past the farm house, into which all the excreta from the sick was thrown; that a short distance below the farm house the brook disappeared in a hole eight feet deep and three feet in diameter. Eighteen hundred pounds of salt was thrown into this hole and soon after the water in the fountain showed the presence of salt and increased solid matter. To prove whether or

not the water flowed under the ridge in a natural channel or by filtration, two and one-half tons of flour were put into the hole. There was no increase of turbidity, or of solid contents of the water in the fountain, thus proving conclusively that the typhoid bacillus passed through a mile of earth filtration.

The Plymouth case is one of the most remarkable on record. On the 20th of April, 1885, a serious outbreak of typhoid fever occurred in Plymouth, Pennsylvania, wherein in thirty days twelve hundred persons were ill with the disease and one hundred and thirty died. The mayor of Philadelphia sent two eminent physicians to investigate the cause. They found the water supply of the town was a mountain brook, which flowed into a reservoir, thence into mains through the town. In Winter the brook froze solid, the reservoir was cut off and the supply was pumped from the Susquehanna river. Seventy families in a suburb, who got water from another source, were not sick. March 24, a general thaw with rain broke up the brook, which flowed down and filled the reservoir. On March 26, two days after, the river supply was cut off and connection was made with the reservoir. In eleven days after this the disease appeared. It was found that in January an inmate of a house on the mountain side had typhoid fever, and the excreta from the patient were thrown on the snow and ice at the edge of the brook, and when the brook thawed these excreta were carried directly into the reservoir.

Bascom says that in the Autumn of 1843, in Minchinhampton, a cemetery was disturbed which had existed five hundred years. About one thousand cart-loads were removed from the surface, and down to within about two feet of those buried. A portion of the earth was deposited on grass fields, as a fertilizer, and a portion in the rector's garden. School children who passed the upturned earth went home and died. The wife, daughter and gardener of the rector died. There were sevenenteen deaths, and two hundred children had measles, scarlet fever and other diseases induced from this saturated soil.

Upon sanitary grounds it may truthfully be said the cemetery has become one of the most deadly foes of mankind. It is predjudicial to the public health. A proper regard for the living dictates that the dead should be buried at such a distance from the living

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that the living can never come in contact with the earth in which they lie, or the water and air which they pollute.

The question of burial at all is now being earnestly discussed by the most prominent sanitarians. It has been discussed at every meeting of the International Health Congress, at London, at Copenhagen, at Vienna, at Berlin, and by the American Public Health Association, the leading sanitary organization of North America.

This matter was the subject of an address delivered by Rev. Charles R. Treat, of New York, before a meeting of the American Public Health Association, held at Brooklyn, N. Y. It is a subject of so much interest that the address is here given entire, with his permission. It will be seen that he advocates neither earth interment nor cremation, but the erection of handsome mausoleums, above ground, where desiccation, instead of decomposition, may take place. The method proposed commends itself from a sanitary, economical æsthetic and sentimental standpoint. The only and most important question that can arise is, is it practical? Careful and extensive investigations have demonstrated its feasibility. With this question once definitely and incontrovertibly settled there will not be lacking a growing disposition to practice the methods suggested:

It is a strange thing that the time should have come to attack the churchyard in its use for the burial of the dead; but it is really far more strange that the churchyard should have come to be one of man's most deadly foes. This, however, every thoughtful man will now have to admit to be true, and this will make easy what otherwise would have been impossible for a tender or reverent mind.

As a general statement it will suffice to quote the words with which Lord Beaconsfield denounced the churchyard, in the House of Lords, in 1880: "What is called 'God's Acre' is not adapted to the times in which we live or to the spirit of the age. The graveyard is an institution prejudicial to the public health; and the health of the people ought to be one of the considerations of a statesman. The time has arrived when a safer disposition of the dead should be instituted."

In view of such a statement, and of many more that come readily to mind that have been made in stronger terms, and most of all in view of the fact that the agitation against the churchyard has been maintained for more than a hundred years, it is amazing that this use should die so hard; and, as we survey the past, it will amaze us more, to be compelled to confess, that the churchyard has been made man's foe by civilized and Christian men!

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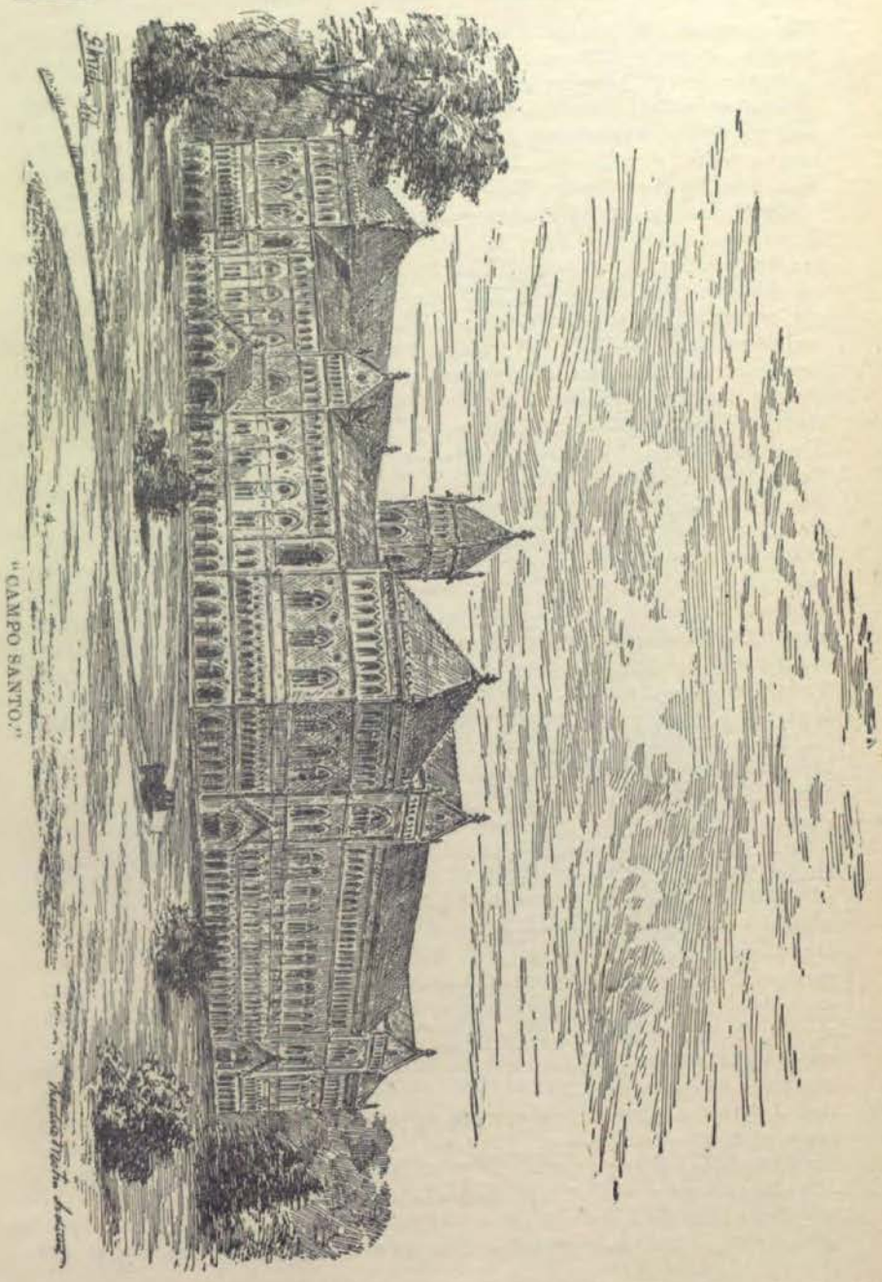

"CAMPO SANTO."

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The story of this use of consecrated ground is so short that, although familiar, it may well be told again.

In the early Christian centuries, as in the centuries preceding, among men of all religious beliefs and practices, the conviction, both instinctive and founded on experience, prevailed, that the dead should not be brought into proximity with the living. Accordingly the practice definitely demanded by the "Twelve Tables" became universal, not to bury within a "city" or any group of human habitations. The first step in the wrong direction seems to have been taken at the dying request of the first Christian emperor, who was interred at the entrance of the Church of the Holy Apostles, in Constantinople. The tendency, however, to follow this example, and to secure similar interment in holy earth, was stubbornly resisted; and it was not until the latter part of the sixth century that burials were permitted within towns or cities, and it was not until the eleventh century that burials were permitted in churches. From this time the custom continued without notable interference, until the latter part of the last century. Then, in that era of tremendous change, the churchyard did not escape. In Paris, the churchyard of the Church of the Holy Innocents was first condemned in the interest of the public health, because much sickness had been traced to the foul stenches that rose therefrom; and it is worthy of special notice, as indicating the extent of the danger, that M. Thouret, the official charged with the duty of disinterring the dead, was overcome by the foul air that he was compelled to breathe, and barely escaped with his life from a putrid fever that he there contracted. A little later the grounds about the churches of St. Germain des Pres and St. Eustache were also barred from burial, and the contents of their graves were carried to the quarries that have since become the "Catacombs" of Paris. In Austria, under Joseph II., the ruler of such unhappy methods but of such noble aims and advanced ideas, the burial of the dead within or near to churches was prohibited by law, and this was such an honest enactment that neither rank nor wealth could evade it.

In England, unhappily, the progress of this reform was not so rapid. Bishop Latimer had soundly said, in a discourse upon the restoration to life of the widow's son at Nain: "The citizens of Nain hadd their burying-place withoute the citie, which no doubt is a laudable thinge. And I do marvel that London, being soe great a citie, hath not a burial-place withoute. For no doubte it is an unwholesome thinge to bury within the citie, especiallie at such time when there be great sickness and many die together. I think, verilie, that many taketh his death in St. Paul's churchyard. And this I speak of experience, for I myself, when I have been there some mornings to heare the sermons, have felt such an unwholesome and ill-favoured savour, that I was the worse for it a while after, and I think no lesse but it is the occasion of great sickness and disease." And it is deserving of mention that Sir Christopher Wren entreated the citizens of London, in rebuilding the city after the great fire of 1666, to put an end to the pernicious practice of burying within their churches and about them, and even within the limits of their city. But these appeals and many more that were more urgent and

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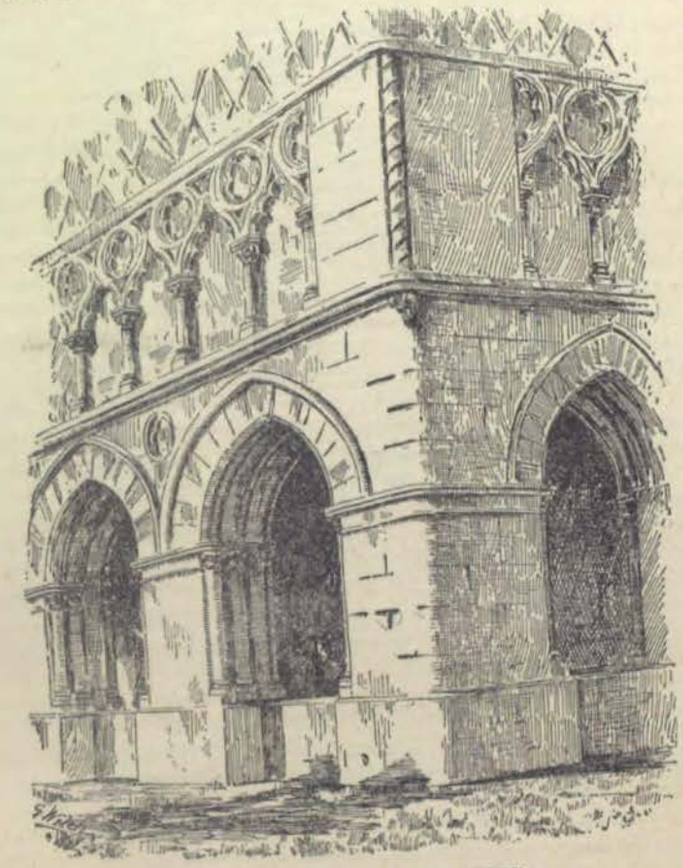
more recent, were in vain, and it was not until nearly the middle of our proud century that England would listen to the reformer of this crying evil.

In this country, partly because there were few places of large population, and partly because it was an early and general tendency to use cemeteries rather than churches and the grounds adjacent to them, the evils of earth-burial did not manifest themselves so soon or in so marked a manner as in the old world. But there were instances enough to convince the most incredulous that a radical change must be made. Dr. Ackerly, writing in 1822,



"CAMPO SANTO," AMBULATORY.

thus describes the condition of the burial-ground connected with Trinity Church, New York, forty years before: "During the Revolutionary War this ground emitted pestilential vapors, the recollection of which is not obliterated from the memory of a number of living witnesses." In the same yea

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the *Commercial Advertiser* published an article in reference to the present evils of earth-burial at the same place, in which it was said: "It will be remembered that the graveyard, being above the streets on the west and encompassed by a massive stone wall, and the east side being on a level with Broadway, it results that this body of earth, the surface of which has no declivity to carry off the rain, thus becomes a great reservoir of contaminating fluids suspended above the adjacent streets. In proof of this, it is stated that, in a house in Thames street, springs of water pouring in from that ground occasioned the removal of the tenants on account of their exceeding fetidness." At a later date Dr. Elisha Harris brought this telling indictment against the same place of interment: "Trinity churchyard has been the centre of a very fatal prevalence of cholera, whenever the disease has occurred as an endemic near or within a quarter of a mile of it. Trinity Place West of it, Rector street on its border, the streets west of Rector and the occupants of the neighboring offices and commercial houses have suffered severely at each visitation of the pest, from 1832 to 1854." It seems hardly necessary to add that the foregoing statements are not intended to make the impression that there was a worse condition at the churchyard named than at any other. The truth is that this only illustrates what was universal throughout the city, and, in proof, it may be cited, among the unsavory recollections of the time, that the sexton of the "Brick Church," Beekman street, was accustomed to caution the persons standing near, when a body was to be deposited in the vaults, saying: "Stand on one side. You are not accustomed to such smells!" And the sexton of the Dutch Church close by was known to have said that, when going down into the vaults, the candles lost their lustre, and that the air was "so sour and pungent that it stung his nose." Naturally, therefore, it was noted in the public press: "This being the case with all the vaults, where dead bodies are deposited and subject to be opened at all seasons, this method of disposing of the remains of our friends is at the least an unpleasant and certainly a dangerous one." And the result was to be expected, that the Board of Health should utter their official protest against the continuance of the perilous practice, as they did in 1806: "Interment of dead bodies within the city ought to be prohibited. A vast mass of decaying animal matter, produced by the supersition of interring dead bodies near the churches, and which has been accumulating for a long time, is now deposited in many of the most populous parts of the city. It is impossible that such a quantity of animal remains, even if placed at the greatest depth of interment commonly practiced, should continue to be inoffensive or safe!"

It may now be said: "Yes, this is all true, but we have changed all that! We no longer inter our dead in church-yards or burial-grounds within the limits of cities. We have provided cemeteries at great distances from our cities and large centers of population, and there the dead can do no harm."

To this the reply is easy and convincing, that, if the dead endanger the living when the population is dense, they certainly also endanger them when the population is sparse. The danger is only diluted. It still exists,

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and it ought to alarm us just as truly when a few are imperiled as when many are. As lovers of our kind, as claiming to be humane, we can no more be indifferent to the danger of a few than to the danger of many. True philanthropy has no sliding scale by which to gauge her gifts. And if the evils of earth-burial issue from the fact that a lifeless body is buried in the earth, then these are not escaped and cannot be, unless the dead are buried at such a distance from the living that the living can never come in

"CAMPO SANTO," CLOISTER AND GLIMPSE OF COURT.

contact with the earth in which they lie, or breathe the air or drink the water which they pollute. Therefore, the question as to the effect upon human health of our cemeteries, can be considered settled in the case of all that are not remote from the habitations or the approach of men; and such cemeteries, as we know, are few, and they are not the cemeteries which lie upon the borders of our great cities.

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To strengthen this general position it will be sufficient to quote the familiar, but weighty assertion of Sir Henry Thompson: "No dead body is ever placed in the soil without polluting the earth, the air, and the water above it;" and the testimony of Dr. Holland, who speaks as opponent of this reform and the antagonist of Sir Henry Thompson, that the best situated cemeteries may be so mismanaged as to become unsafe; that cemeteries should not be too near dwellings; that they should not be overcrowded; that the soakage from them should be carfully guarded against; and that wells near burial grounds are unfit sources of drinking water; and the declaration of the French Academy of Medicine, that the cemeteries of Pere-la-Chaise, Montmartre, and Montparnasse, once suburban now intramural, are the cause of serious disorders of the head and throat and lungs, that result in the loss of many lives; and to note the experience of Brooklyn, half-girdled with graves, of which the editor of *The Sanitarian* does not hesitate to assert: "Typhoid fever is, taking one year with another, increasingly prevalent in Brooklyn, and it is, in our judgment, probably due for the most part to sewage-pollution of the intensest and most loathsome kind—the seepage of graveyards!"

Thus far this subject has been treated as though the only evil influence that a decomposing body could exert would be through the poisonous character of the resultant compounds. Unhappily, the story is only partly told, and greater dangers remain to be revealed.

Within a few years it has become unquestioned that some of the deadliest diseases that attack mankind owe their origin and propagation to living organisms, and it may yet appear that the field of their operations is far wider than we now think. Not to attempt to tell all that has been ascertained, it will be sufficiently convincing to quote from Sir Henry Thompson's utterance in the *Nineteenth Century*, in 1880: "I state, as a fact of the highest importance, that, by burial in the earth, we effectively provide—whatever sanitary precautions are taken by ventilation and drainage, whatever disinfection is applied after contagion has occurred—that the pestilential germs which have destroyed the body in question are thus so treasured and protected as to propagate and multiply, ready to reappear and work like ruin hereafter for others. * * Beside anthrax, or splenic fever, spores from which are notoriously brought to the surface from buried animals below and become fatal to the herds feeding there, it is now almost certain that malarious diseases, notably Roman fever and even tetanus, are due to bacteria which flourish in the soil itself. The poisons of scarlet fever, enteric fever (typhoid), small-pox, diphtheria, and malignant cholera are undoubtedly transmissible through earth from the buried body." That the burial of a body that contains the seeds of zymotic disease is simply storing them for future reproduction and destruction, is amply proven by the researches of Darwin and Pasteur, of whom the former has shown that the mould, or fertile upper layer of superficial soil, has largely acquired its character by its passage through the digestive track of earth-worms, and the latter, that this mould, when brought by this agency to the surface from

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subjacent soil that has been used as a grave, contains the specific germ of the disease that destroyed its tenant.

We may fitly close this portion of the discussion with the conclusion, so strongly stated by Dr. James M. Kellar, in his report to the session of the American Public Health Association, at St. Louis, in 1884, which is far from

"CAMPO SANTO," ANGLE OF CLOISTER.

an over statement of the truth: "We believe the horrid practice of earth burial does more to propagate the germs of disease and death, and to spread desolation and pestilence over the human race, than all man's ingenuity and ignorance in every other custom."

It may now be asked: "Granting that these evils are inseparable from the burial of the dead in the earth or in tombs, what is the remedy? What else can be done?"

To this question not many answers can be given, because the modes of disposing of the dead have always been and must always be few.

Plainly, no such novel mode as casting the dead into the sea will be generally adopted. Plainly, also, the mode of the Parsees, grounded as it is in ancient, if not original, use—to give the dead to beasts and birds—will not become universal. And, plainly, also, cremation will not be welcome to the many, free as it is from objection on the score of public health, if a method equally sanitary, and at the same time satisfactory to a reverent and tender sentiment, can be devised.

The inquiry, then, has reached its limit; for, apart from the modes that have just been named, there are no others but earth burial and entombment; and earth burial, as we have seen, cannot be made sanitary under common conditions. Therefore, if the demands of affection and sanitation are both to be met, entombment is to do it or it cannot be done.

Happily, better than any other method of disposing of the dead that has ever been devised, entombment has met the demand of affection. Never has any other mode so commended itself to men as this. There may have been at times a general adoption of cremation, and there may have been a general prevalence of earth burial, but the one has not long satisfied the sorrowing survivors, and the other has owed its beginning and continuance to the apparent absence of alternative. Wherever the living have been able, and the dead have been dearly loved or highly esteemed, the tendency to entomb and not to bury has been constantly manifested.

To call attention to this tendency is enough to prove it, so easily accessible is the evidence, and so familliar is its operation in the human heart. The most natural reference will be, first, to the Mausoleum, the tomb of Mausolus, that was erected by his sorrowing Queen, Artemisia, at Halicarnassus, upon the Ægean's eastern shore; and that became at once one of the few great wonders of the ancient world. This was intended to do honor to the loved and illustrious dead; and this it did like no grave or pyre could do. This was also intended to protect the lifeless form from ruthless robbery and reckless profanation; and it performed this task so well that for near two thousand years no human eye beheld the mortal part of Mausolus and no human hand disturbed its rest. At a far earlier time, Abraham, the Father of the Faithful, while he illustrated this tendency to entomb the dead, also offered an influential example to all who would do him reverence, as in the hour of his great sorrow, he sought the seclusion and the security of Machpelah's cave for the last resting place of his beloved wife. There he buried Sarah; there he and his son and his son's son and their wives were all laid to rest, and the place of their repose hath not been violated even at this distant day. To this constant tendency constant testimony is borne by the massive and magnificent tombs in which India abounds, the tombs and pyramids that make marvelous the land of the Nile, the tombs that stood thick upon the Appian Way and that rose superb upon the Tiber's shore, the modern use to which the Pantheon is put, the Pantheon at Paris and the Crypt of the Invalides, the Abbey of Westminister, matchless in memorials, the sepulchres within the hills that

gird Jerusalem, and the sepulchre in which the Nazarene was gently laid when his agony was ended.

It remains to consider whether entombment can be made sanitary; if it can be the problem is solved, for entombment has ever been the best that the living could do for their dead, and with the added advantage of promoting or ceasing to be prejudicial to the public health, entombment will be the choice of all whom cost or caprice does not deter.

"CAMPO SANTO," FAMILY COMPARTMENT.

That entombment can be made sanitary is evident from the fact that, in countless instances, in many lands and through long periods of time, it has been made sanitary by the ingenuity of man, or by unassisted nature; and it is also evident from the fact that decomposition and disease germs are the dangers to be guarded against, and that against these both ancient and modern science have been able to guard. Not to enumerate all the modes that

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have been chanced upon, or that have been devised by men, there are two that have been notable and are available for modern use—embalming and desiccation.

It is a delusion to imagine that embalming is a lost art; that like some other marvels of the ancient time, this is a secret process that perished with the people that employed it. Did we desire it, we could embalm our princes and our priests, and retain their shrunken similitudes for distant coming times to gaze and gape upon, as skillfully as they who practiced this art in Egypt's palmiest days. Nay, it is doubtless far within the truth to claim that better than they did we could do; and we are actually apprised of better methods and results than they employed or could attain, and it is not unlikely that we shall hear of better methods still. But Egypt's method, or its modern counterpart, will hardly now be popular. It involves too much mutilation and too much transformation. When it has done its work little is left but bone and muscular tissue, and these are so transfused with foreign substances, that a form moulded from plastic matter, or sculptured from stone, could almost as truly be considered that of the lamented dead as this. Moreover, indefinite preservation of the dead is not desired. The uses to which the Egyptian Pharaohs and their humbler subjects have been put in these days of indelicacy and unscrupulousness in the pursuit of science or sordid gain, are not such as to make many eager to be preserved for a similar disposition; when the present shall have become a similar distant past.

Desiccation, in striking contrast with embalming, is the process of nature rather than of art, and involves no mutilation and no substitution of foreign substances for human flesh, and does not by unnatural means preserve the semblance of the human form so long that a susceptible sentiment is shocked and a due return of material humanity to the elements that gave it birth prevented. Desiccation is so far a natural process, that it seems not to have been thought of until nature had done the work and shown the product; and through many centuries and upon an extensive scale, nature had employed the process before it occurred to man to copy her and adopt her method for the disposition of his dead.

Wherever the air that enwrapped the lifeless form of man or beast was dry, desiccation anticipated and prevented decomposition. In deserts, upon elevated plains, upon the slopes of lofty mountain ranges, to which the winds that passed their summits bore no moisture, the dead have not decayed, but have dried undecomposed. In the morgue attached to the Hospice of St. Bernard, the dead lifted too late from their shroud of snow and borne thither to await the recognition of friends, dry and do not decay. In the "Catacombs" of the monastery of the Capuchins at Palermo, and in the "Bleikeller" at Bremen, the same phenomenon has appeared. Even Egypt is a confirmation of these statements, for it is probable, that had much less care been taken to preserve the dead, they would not there have yielded to decay as in other lands; and that moisture is so far absent from the atmosphere that the dead would have been preserved from decay by desiccation had not embalming been resorted to. Upon the elevated western plains of this

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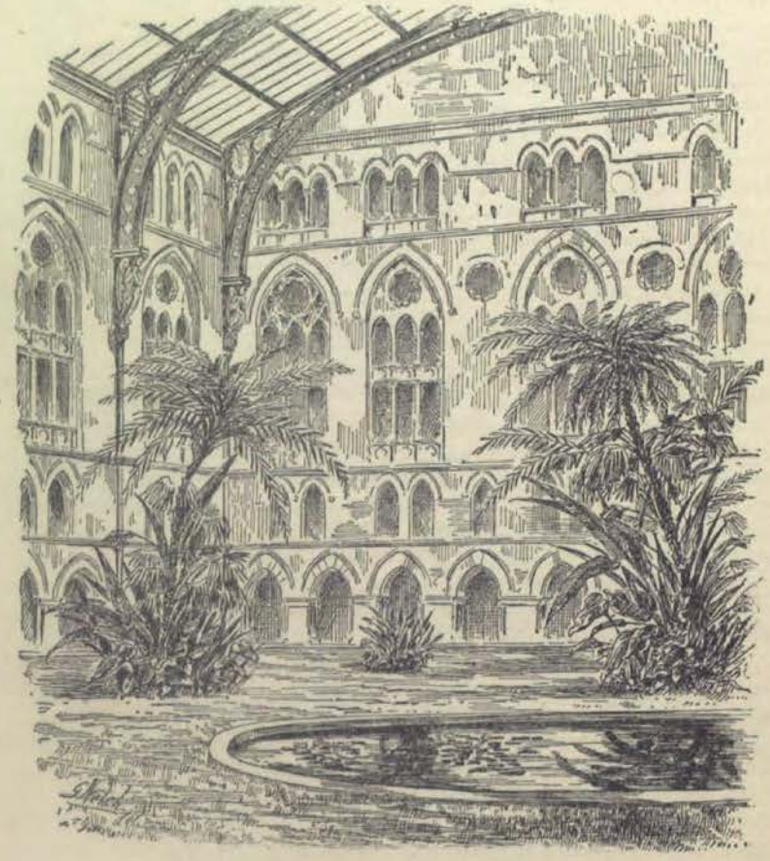
continent, the bodies of beasts and men by thousands, have been preserved from decomposition by desiccation. To take one instance out of many that might be cited: A cave was not long ago discovered high up among the Sierra Madre mountains within which were found, where they had rested undisturbed for many years, the lifeless figures of a little aboriginal household,



"CAMPO SANTO," INNER COURT.

dried and undecayed. Father, mother, son and daughter, one by one, as death had overtaken them, had been brought thither, bound so as to keep in death the attitude that had marked them when at their rest in life, and there they bore their silent but impressive witness to the beneficient action of the unmoist air that had stayed decay and kept them innocuous to the living that survived them. In Peru, instances of this simple, wholesome process abound on almost every side; upon the elevated plains and heights, as also

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beside the sea, the dead of Inca lineage, with the lowliest of their subjects, are found in uncounted numbers, testifying that in their death they did not injure the living, because desiccation saved them from decomposition; and a recent traveler has vividly described the scene that a battlefield the late war presents, and that illustrates the same process, where, though years have passed since the last harsh sound of strife was heard, the fierce and bitter combatants still seem eager to rush to conflict or to sink reluctant into the embrace of death. And all these instances furnish conclusive proof that decomposition can be controlled, and that its loathsome and unwholesome transformations can be prevented, if only the simple conditions can be secured that have already so extensively effected this result. That these conditions can be secured no one can doubt; for, every day, in almost every clime, by processes familar and available to man, the atmosphere has moisture added to it or taken from it; and the extraction of the moisture from a portion of the atmosphere is all that is required to introduce the process of Peruvian desiccation into the sepulchres of Chicago or New York.

It will naturally be further asked, "Is this all that has been done to demonstrate the efficiency and availability of desiccation for the dead?" To this the answer would be sufficient that the evidence that has been adduced is ample; and that, at once, in perfect confidence as to the result, mausoleums might be erected, with provisions for the withdrawal of the moisture from the atmosphere and for the passage of the desiccated air through the sepulchres in which the dead should rest. So little is involved, and so much has been accomplished without the application of any human skill, that it seems inevitable that, as soon as the resources of modern architecture and sanitary science are drawn upon, the desired result will be at once attained. But to make assurance doubly sure, several carefully conducted experiments have been made, under the supervision of the directors of the new mausoleum movement, that prove that the conditions of desiccation can be controlled, and that decomposition can be prevented, that where it has begun it can be stayed, and that prolonged preservation, with a fair approximation to the appearance in life can be made sure, for the recognition of absent friends, for transportation, or for the furtherance of the ends of justice.

When, now, it is added, that desiccation has been ascertained to be an efficient agent in the destruction of disease germs, as proved by the experiments of Dr. Sternberg, of the Hoagland Laboratory, and by the investigations of other experts, enough seems to have been said to establish the truth of the assertion, that entombment can be made sanitary, and that, therefore, entombment offers the satisfactory solution of the problem how to dispose of the dead so as to do no violence to a reverent and tender sentiment, and at the same time not to imperil the public health.

The proposition then, soon to be submitted for public approval is this: to erect in the suburbs of our large towns and cities, perhaps even in their most thickly-populated parts, extensive and handsome edifices that will provide sanitary sepulchres for the dead. To be comparatively inexpensive, they will have to be comparatively plain; and it seems not too much to hope that our

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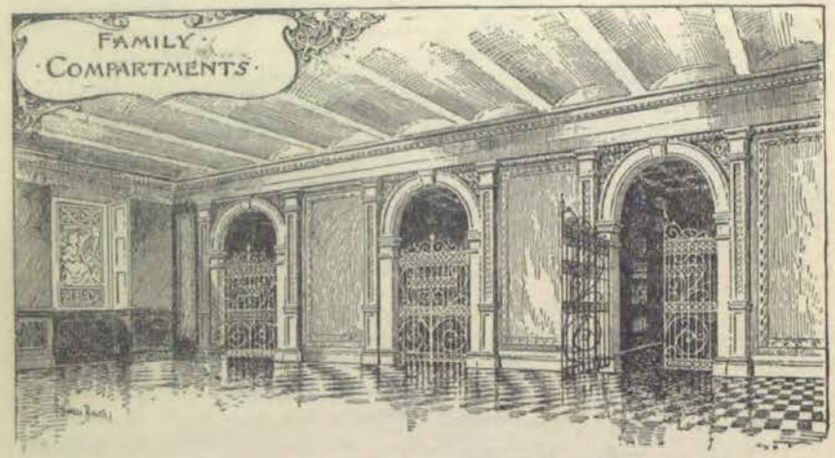
cities will soon adopt this mode of disposing of the dead that depend upon the public care for burial, and that the horrors of a "Potter's Field," of which it can not be divested in a fair and sea girt isle, may be furthermore unknown of men.



All these structures, however, will not need to be inexpensive and plain. Many of them, as the rich shall lavish their wealth upon them, will be spacious and splendid, as no tombs of earlier times have ever been. These will naturally differ in design and plan, and while one will incline to one order of architecture another will incline to another; one will incline to the light and graceful style of the Greeks; another to the substantial and enduring Roman type; another to the still more firmly built and time-defying type of the Egyptians; another to the rich and exquisitely decorative Byzantine style, and another to the Gothic type, with its suggestions of spiritual aspiration and heaven-sent consolation and heaven-born peace. It should certainly be the architect's study to avoid, as either of these styles is adopted, the appearance of edifices with familiar and established secular or sacred uses. These must, if possible, be so designed as to speak of repose and loving care and undying recollection, and should appear to be homes for the dead, and yet temporary habitations in which they only rest until the resurrection.

Perhaps the most favored style will be that of "Campo Santo," like that at Pisa, where the Holy Field lies light upon the dead, and where the softened sunshine and the tempered wind and the hushed notes of happy birds and the sweet seclusion of the spacious and graceful Gothic cloister, with its memorials of many who have been loved and lamented, and its rare pictorial teaching of the life to come, all speak soothingly of hope and peace and comfort. Such a "Campo Santo," modified to meet the demands of modern life and art, might well be one of the crowning monuments even of this wondrously achieving age. To what a grand and noble consummation would it

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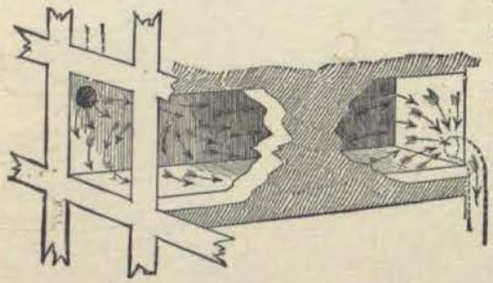
seem to lead the race in their efforts for a fitting disposition of their dead! And what honor would it reflect upon the men who should erect it and place it at the command of their fellows in due regard for what both health and heart require.

Within, there would be, as the unit of construction each sepulchre, so constructed, that anhydrous air could enter, or could be made to enter, and withdraw, laden with moisture and morbfic matter, which it would convey to a separate structure, where a furnace would complete the sanitary work that the anhydrous air had begun, and return to the external atmosphere nothing that would be noxious. Each sepulchre, in itself and it surroundings, would appear to provide a place of repose, and would have electrical appliances attached to it for the instant indication of the return of consciousness to any who had been prematurely entombed; and would promise and provide the most perfect and permanent protection against intrusion or theft that can be found on earth. In arrangement these sepulchres would have to conform to the price paid and the taste of the purchaser. Many would be like the single graves that thickly ridge portions of our cemeteries; many more would be grouped together after the semblance of a family tomb, as in the illustration; but in the general impression, in the surroundings and suggestions, the resemblance to the provisions of a cemetery would go no farther. For here, there could be no burning sun, no chilling cold, no inclement storm; for the living, as they should pay the last sad honor to the dead, or in any subsequent tribute or affection, there could be no exposure, and for the dead, there would be only the semblence of the comfort and the quiet of the best ordered and most tranquil house. Thus in providing the utmost that exacting affection and sanitary science can require, and in taxing to the utmost resources of art, in architecture, in sculpture, and in the use of subdued and according hues and forms for appropriate decoration, these "Campo Santos," or



Save the Babies.

"Mausoleums," or "Mansions of the Dead," will seem to have realized the ideal disposition of the mortal remains of those who depart this life.

In conclusion, it is evident that the present modes of disposing of the dead are unscientific, unwholesome, repulsive, and, in a word, unworthy of this enlightened age.

On the other hand, it is apparent that the new Mausoleum method of disposing of the dead affords relief from all these obnoxious features, inasmuch as it provides for the perpetual care of the dead; protects from premature interment; protect the dead from theft; protects the living from exposure, while paying the last duty to the dead; meets the demand of the most reverent and tender sentiment; meets the urgent sanitary demand that the dead shall not endanger the living; meets the medico-legal demand that the evidence of crime shall not be destroyed; and costs less, in view of its manifold advantages.

SAVE THE BABIES.

Tupper said, "A child in a house is a well-spring of pleasure." The sentiment finds an echo in every human heart. There is scarcely an intelligent human being, whether old or young, who is not interested in the prattle and innocence, the sunshine and frankness of the child. How changed, not only the child, but the whole household, as well, when the babe is sick, and droops and dies. There is no greater anguish that comes to a parent's heart than the loss of the innocent babe. And yet it may not be, surely is not an overestimate to state, that of all the children born in the world, fully one-fourth die within the first year. These slaughtered innocents—for surely one-half this number, if not more, die from preventable causes—mutely and vainly appeal for protection and for life. One of the most interesting and admirable, as well as touching incidents in the life of the Shepherd King of Israel, was when he exclaimed during the fatal illness of his child: "Who can tell whether God will be gracious to the child, that it may live?"

The causes of most of this terrible fatality are few and easily ascertained, and most are of such a nature that they could and should be removed. Dismissing those cases that are a result of hereditary disease because of vicious lives upon the part of the parents,

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it may be said that nearly all this infant mortality results from improper clothing, impure air, uncleanliness, lack of exercise outdoor and in the sunshine, and improper feeding.

Important as it is, that the food should be of proper quality and quantity, the method of taking the food is of permanent importance—a fact that few seem to be conscious of. During feeding, the child should be kept specially warm. At such times the blood leaves the extremities, and the surface of the body, and flows to the stomach and alimentary canal to aid in digestion, and as a result a chilly sensation is produced, and the child, sensitive as it is to cold, always suffers in consequence. Hence, there is no more sensible and natural way than for the small babe when feeding whether from the breast or from a bottle, to be pressed up close to the body of its mother or nurse. After the repast has been partaken, and digestion is completed, then the child may be taken out and "aired;" for then is fulfilled the old proverb "the south wind blows after dinner"—there is general warmth. In regard to the *posture* of the child while feeding, one of the most prominent physicians in the United States—Dr. Dewees, of Philadelphia, said: "The child should not receive its nourishment while lying. It should be raised, which will not only become a pleasanter position, but it also diminishes the risk of strangulation."

Dr. Roth, senior physician to the sanitarium for women and children, London, says: "The semi-erect position which the child adopts in sucking is not only favorable, as affording it the readiest means of partaking of the mother's heat, but there is beside an anatomical reason, the stomach is placed more perpendicular as to position; there is but feeble muscular power in it; and the cardiac opening is less liable to contract and retain food taken. Thus in any other position of the child but semi-erect, the milk taken is likely to be brought up again."

July, August and September are generally the months most fatal to baby life, especially to the babies of the great cities. During the heated term a short time since, the mortality occurring in Chicago and New York among the young children was fearful. The deaths from cholera infantum are most numerous. It is generally attributed to the great heat, and yet cholera infantum is comparatively rare in even the extreme Southern States—the Gulf States. Various reasons have been assigned for this. One is, and the one

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most generally accepted, that it is the continuous elevated temperature; that a temperature of 84° F. for forty-eight hours day and night, is the most productive, and almost an essential to the production of the disease, especially in anything like an epidemic form.

While in the Gulf States the heat for weeks at a certain part of each day is in the sun 90° or 100°, yet it is cool and grateful in the shade, and the nights are refreshing. It is far different in the North. There may be three or four days of very high temperature, with nights even more sultry and relaxing, not only in the great cities, but even in the country. It is during these protracted extreme thermal periods that the babies, especially "those raised by hand" are carried off.

Personal opinion based upon careful observation and investigation, teaches that this continuous heat through fermentive processes developes, in the milk fed to children, the poison known as tyrotoxicon, and that the great prostration, and rapid development of head symptoms, are the common and usual symptoms of poisoning by this alkaloid. It is the same poison that produces such wholesale sickness from eating ice cream, cheese and canned meats at times.

Prof. Vaughan, of the University of Michigan, states that tyrotoxicon will speedily be developed, often in dangerous if not fatal quantities, in milk that has not been cooled, and that has been hauled for some distance in the hot sun, or allowed to stand in tightly covered cans without ventilation.

The most fruitful factor of all in the production of this poison is the use of the rubber tube, furnished with so many nursing bottles. It is *impossible* to keep these rubber tubes clean and sweet. There is always some of the milk retained, and this is sure to undergo decomposition, and during this process tyrotoxicon may be, if it is not always, produced.

All druggists, when they sell prussic acid, or strychnia, or any poison, have on the label of the bottle or package, not only the name of the drug, but as an additional warning, a skull and cross-bones; and, in Iowa, they are required by law to have printed on the label at least two of the most reliable antidotes to be used in case of accidental poisoning.

All persons manufacturing these nursing tubes should be required by law to make for each one, or at least to sell with each one, a bottle made in the shape of and labeled "Coffin," so that every time the mother feeds her darling from it she may be reminded of the risk she is running.

If there was nothing better there might be some excuse. The plan practiced by our grandmothers, and by many sensible mothers of to-day, of feeding with the spoon, is infinitely better. Perhaps better still than the spoon, with ordinary care, is a bottle of proper size covered with a *rubber nipple*. With such an outfit kept scrupulously clean, and milk that has been sterilized by boiling thoroughly, there need be no fear of tyrotoxicon poisoning, and but little fear of cholera infantum.

Mr. Josh Billings, a philosopher of rare genius and a writer of cosmopolitan fame, says:

> Babys i luv with all mi hart. I would like to have 15 babys now on mi lap, and my lap is'nt the handiest lap for babys either. Mi lap is long enuff but not the widest kind of a lap. I am a good deal of a man, but i konsist of length principly, and when i make a lap of miself it is not a mattress, but more like a couple of rails with a jint in them. I can hold more babies on mi lap than any other man in America without spilling one, *but it hurts the babys.*

In the closing sentence of the above extract Mr. Billings shows that he not only has genius as a writer, but has a "hart" full of the milk of human kindness. For a man who loves babies as he does, with so capacious a "lap," to deprive himself of the pleasure of holding them because of the angularity, or rather incisiveness of his lap, shows an amount of consideration, if not of self denial, that is highly commendable. Even on a wider lap, and one well padded, the practice of dandling the baby on the knee, riding it to "Banbury Cross," jumping it half way to the ceiling and letting it come down with a thud upon the knee, is a most pernicious practice, and "hurts the baby." Many a baby is fatally hurt in that way by producing knotting of the intestines, spinal concussion, and subsequent spinal disease, or by producing rupture. The practice is prompted by the greatest kindness, though fraught with many dangers to the baby. But it is not only a source of danger to the baby, but to the parents as well. Children, like those who are older grown, are creatures of habit, and when once a baby has acquired the habit of being carried about, or dandled upon the knee, it is hard for them to deny themselves the pleasure. Often, by loud cries and other forceful methods, they compel the poor father or mother, in the dead of night, improperly clothed for the chill that has crept into the house, to get out of bed and walk the floor, or "make a lap" and dandle the baby for an hour at a time. Such exercises not only expose the unfortunate parents to attacks of "cold" but are trying to the temper, and often so demoralize them as to cause them to make a shipwreck of patience as well as of health. Better a great deal, teach the baby to lie contentedly and suck its thumb; or allow it to defy mamma's ideas of propriety by kicking up its heels and soiling its dress while lying upon the floor or rug, than to take it on excursions to "London Town."

For general hygienic care of infants the following suggestions by Dr. Benjamin Lee, of Philadelphia, Secretary of the Pennsylvania State Board of Health, are most heartily and earnestly commended to the mothers of Iowa:

CLEANLINESS.

To infants, cleanliness is life, filth is death. The child, to retain health, must be clean, and its surroundings must be clean. It needs a clean skin, clean clothes, clean water, clean food and clean air. It should be bathed night and morning in a warm room, away from any draught, and in water from which the chill has been taken. As the child grows older, and in the Summer time cooler water may be used. The body should be cleansed from head to foot, with a soft sponge or piece of fine flannel; use only pure soap, and keep it away from the eyes. Dry the whole body with a dry warm towel, using but little friction; for active rubbing and strong soap are injurious to the skins of babies. In the Summer time the child may be left in the cold bath ten or fifteen minutes, but a child should never become chilled while bathing. In all cases, when the bath seems to injure the child, consult the family physician.

Change the napkins as soon as soiled. Don't use them a second time until they have been washed. If possible, don't dry them in the same room in which the child lives.

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KEEP THE PREMISES CLEAN.

This applies to the home, and all its surroundings. Keep the house cool and well aired. Never permit it to get musty and damp. Keep the cellar clear of all decaying vegetables, or other offensive or mouldy material, whitewash it frequently, and see that it is well aired. Death lurks in the darkness and dampness of many a cellar. In country places throw the kitchen waste as far as possible from the house, the cistern and well, and frequently disinfect the place with quick-lime, or cover it with fresh earth. Locate the privy as far as possible from the house and the well, and keep it free from all odors by the frequent use of copperas, lime or fresh earth, or coal ashes. The dry earth system only should be used in the country and in villages. Keep every part of your premises clean, and insist that your neighbor shall do the same with his.

FRESH AIR.

Let the child be in open air as much as possible, except on very cold, very windy, wet or damp, chilly days. Do not take it out too early in the morning, or keep it out late at night, or in the middle of the day expose it to the direct rays of the sun; with these precautions, if in cold weather it is thoroughly bundled up in woolen clothing, it can hardly be out of doors too much. Except in the hottest part of the day, exposure of a child to the direct rays of the sun will do it good. A brown skin means health to a child. Air should circulate freely through the house, the windows being opened for this purpose every day. Especial care should be taken to give the child an abundance of fresh air when it is sleeping, care being taken to avoid drafts. When the air in the house seems damp it should be dried by a fire in a grate or stove.

CLOTHING.

The clothing of infants should be light and loose, permitting the free use of the limbs. Dr. Felix Oswald truly says: "If many children could use their limbs more they would use their lungs less." They should be clothed much more lightly in Summer than in the Winter, for in the one season, cold kills many babies, and in the other, heat kills them. All sudden changes of temperature

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should be met by appropriate changes of clothing. Don't permit the common, deadly practice of leaving the arms and legs bare, but clothe every part, except the head, warmly. Woolen clothing is best, and should always be worn in Winter, and even in Summer it is best that a thin, flannel shirt be worn next the skin. If this is thin, it will not be much warmer than if of cotton, but very much more healthful. Many mothers make the mistake of *too warmly* dressing their babies and children in Summer months. The flannel worn should be thin in Summer and thick in Winter. Never permit the child to wear the same clothing night and day, but completely undress it at night, and hang up the clothing so it will air through the night.

SLEEP.

Let babies and young children sleep all they will, for sleep is an absolute necessity for their vigorous development. They should regularly be laid to rest at stated times, *away from noise and the light.* The child from the very first should be taught to go to sleep in a cot, without being rocked, nursed, or carried about. No kind of cordial, spirits, syrups, sleeping or soothing drops, or any other remedies should ever be given by the nurse or mother to make a child sleep. If the young child is sleepless it is ill, and medical attendance should be summoned. It is a bad habit for the mother and child to go to sleep while the child is nursing in bed. *Children from two to six years of age are often cross and ill natured for want of sleep.*

NURSING.

A mother, while nursing, ought to live well and generously, but not carelessly or grossly. Spiritous or malt liquors should not be used unless prescribed by the family physician. The mother should remember that what would produce *colic* in the baby, if eaten by it, will *often* produce *this* trouble in it when eaten by *the mother*, and thus by care in her own diet she may save herself much trouble, and her baby much pain. If she suffers from giddiness, palpitations, shortness of breath, night sweats, or feels exhausted as the child nurses, or if her milk seems to disagree with the child, she should consult a medical man concerning the propriety of weaning the child. Pure, healthy breast milk is the best food for babies, and so long as the child thrives upon it, and the supply is

sufficient, it needs nothing else. Nurse a child at regular intervals; under two months, every two or three hours during the day, and three or four times during the night; at six months, five or six times during the twenty-four hours. Do not fail to give the baby water several times each day. Babies relish it and need it as much as older people. Do not nurse the baby to stop its crying, but only at the regular intervals. A child should not be weaned suddenly, but by degrees. After the ninth month it should be weaned; but never just before or during the hot season. Before the child is six months old, if the mother is weak, but her milk still agrees with the child, it may be fed on cow's milk, alternating with the mother's milk. If the supply of breast milk is very small, but still agrees with the child, it should still be continued as a safeguard against illness. The mother's own milk is usually to be preferred to that of a wet nurse.

FOOD.

A very frequent cause of the early death of young children is improper feeding. The natural food for babies is the breast milk of its own mother; next that of a wet-nurse; lastly *unskimmed* cow's or goat's milk; the latter is very nourishing and easily digested. For young babies, remember, milk and milk only, should be used as food. They need no gruel, butter, honey or castor oil; these things are all worse than useless—they are dangerous. Too much care cannot be exercised to secure pure milk. It is now believed that milk derived from a number of cows is better than that from one cow. If from one cow, care should be taken not to get it from a cow which has been milking too long, since milk frequently deteriorates from this cause; also, when the milk disagrees with the child, it will be well to change the cow. So soon as the milk is received it should be placed on the stove and brought to a boil, then placed in the coolest place—on the ice or in the well. The vessel in which the milk is kept should be daily scalded out with boiling water, and cleaned with soap, being kept perfectly pure and sweet. Earthen or glass or stoneware vessels are preferable to tin ones for keeping milk in. *Never give a baby sour or musty milk;* it must be always sweet and pure, and freshly prepared each time; if sour throw it away and get some fresh; it cannot be safely sweetened. When fed to the child the milk should be diluted

with one-fourth or less water, and a little sugar added, but before adding water be sure that the milk-man has not previously added it. If undiluted milk agrees with the child use it. Use "condensed" milk if the fresh cannot be had pure. Under six months children can be stuffed with, but not nourished by, corn, flour, arrow-root, baked flour, and all kinds of starchy foods. These are of no value at all to children under six months, and they may be, and often are, starved to death on these things.

Where the child has cut its front teeth it should have some light food, as bread, baked flour, or milk—biscuits added to its milk. Once a day it may have meat broth or beef tea, with bread or biscuits soaked in it, or the yolk of an egg, lightly boiled. When it is a year and a half old it may have some fine chopped meat, but milk should be its principal food. At two years it may eat of corn meal mush, rolled wheat, oat grits, etc.; but such food as solid meat and potatoes, fat pork and fish, which form the food of adults, should on no account be given to babies. Do not give any of the patented baby foods sold at the stores, unless *on the advice of your family physician.* Creeping and crawling children must not be permitted to pick up unwholesome food.

The nursing bottle needs special attention. It should be oval, with no corners or rough places in which the milk may lodge and become sour. A plain, black, rubber nipple to slip over the mouth of the bottle is the best pattern. Never use the elaborate and complex nipples with glass and rubber tubes attached, because they cannot be readily cleansed, and they also invite in the baby the habit of sleeping with the nipple in the mouth, a thing which should never happen. Both bottle and nipple should be thoroughly cleansed *in boiling water* after each using, and then kept in cold water, to which a little baking soda has been added, until used again.

SUMMER COMPLAINT.

July, August and September are the worst months, and the "second year" the dreaded period of the child's life. As preventive measures are recommended:

1. The nursing of the child over the second Summer, when this can be properly done, if the mother's milk agrees with the child, and she is not exhausted.

Save the Babies.

2. The wearing of a thin flannel shirt by the child all through the Summer. It should be thin, and in hot weather *very thin.*

3. Feeding only milk or other food known to be fresh and absolutely pure.

4. Whenever possible, babies should spend the Summer months in the country.

If the above precautions could always be carried out, summer complaint would be almost unknown.

At all events during the Summer months, give the child pure water to drink at frequent intervals; for it needs water to supply that lost by perspiration. Bathe it in cool or tepid water twice a day. Keep it in the open air as much as possible, and where the air is pure. Don't permit it to have any sour, unripe or overripe or half-decayed fruit. Even ripe fruit may cause injury if the child be allowed to indulge at will.

Give no laudanum, no soothing syrups, no paregoric, no teas, nor any other drugs, medicines or remedies, unless directed by the family physician.

DISEASES OF CHILDHOOD.

It is the common belief that measles, scarlet fever, whooping cough, mumps, diphtheria and the other diseases of childhood are necessarily contracted by every child. This is a mistake. These diseases are all contagious, and pass from person to person by actual contact. By great care their spread may be restricted, and the lives of many children saved. When diseases prevail in a community, withdraw the children from the day and Sunday schools, and so far as possible, isolate them from other children. In no case should they attend the funeral of a person dead from any of the above diseases, and in case of scarlet fever and diphtheria it is best for the parents to remain away as much as possible from the houses where they prevail, no matter in how light form.

Abuse of the Brain.

ABUSE OF THE BRAIN.

Inasmuch as the American people suffer so much from nervous disorders they have as a nation been for some years in search of brain food. Beans, fish, phosphorus-containing foods, celery, etc., have one and all been heralded as preventives or curatives of insomnia, brain softening, and that large list of neurotic affections so prevalent in this country.

Below is an extended article on this subject by Prof. Allen McLane Hamilton, M. D., a man of extended observation, and excellent judgment. It is practical, suggestive, and if carefully read, and its conclusions and recommendations heeded, excellent results will follow. It is surprising that the doctor has made no reference to the use of tobacco, especially in minors, as a most prolific source of nervousness; for tobacco, as much, if not more than anything else, contributes to nervous depression as well as to heart disease.

Dr. Hamilton says: "Nervousness is the great brain trouble in this country. It is caused chiefly by the continued strain of business. Americans take too little time to think about their health, and to think especially about their brain. All the time they are thinking of business; how to get on in the world, and how to make a fortune. Many of them would work twenty-three hours out of the twenty-four if they possibly could, and would then complain that they hadn't time to attend to their business properly. This continued strain on the brain is also the cause of so much insomnia that is prevalent. People who live in foreign countries do not have anything like the amount of brain trouble that those who live in this country have. They give themselves more rest than we take here, they have more holidays, more times like the recent Centennial time, when all thoughts of business are put on one side and the whole community give themselves up entirely to rest and pleasure. I think those three days' holiday in this city did those who availed themselves of the holiday, more good than they will

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ever be able to know of. They may have got tired out physically, but it was a great rest for their brains. During the time of the festivities their minds were entirely removed from business thoughts and troubles. Another cause of the nervousness of Americans is that they keep their brains working in too narrow a channel. They don't seem to develop it enough. They keep working along in the same groove all the time; of course, I am speaking of the majority. The man of business, the merchant or the broker, studies chiefly the market in which most of their transactions occur, and lets other subjects go by. Children's minds are not developed properly, in my estimation. They want to have a wide range of study, and they want to have that study made as easy as possible for them. Their brains are not as strong as those of an adult. They must be trained carefully, and their studies should be made just as light as possible. Another great mistake that Americans make is in their diet. They take as adults too much of a vegetable and a farinaceous diet; they drink too much beer, and eat too many sweets. Children should have more farinaceous food, and adults should eat more meat, and take more of an animal diet. Meat produces hysteria when eaten by young girls, and when taken by young boys is likely to produce convulsions. Insomnia and other nervous diseases are due to insufficient exercise, misuse of the brain and abuse of food; such as eating hot bread and hot cakes for breakfast. Adults want more meat than the average American adult eats. This climate demands that the inhabitants of the country eat a more nutritious food than is eaten elsewhere; then again Americans are much less fitted to take stimulants than foreigners are, on account of the climate in which we live. I think that foreign vices are responsible in a very large degree for American nervousness. The habit of taking alcoholic drinks before meals is one of these bad vices; and very few know the tremendous amount of harm and injury that one drink before breakfast in the morning causes. The foreign habit of drinking absinthe, liqueurs and cordials, is another very bad one. Brain food is a misnomer. Many people claim that fish is a brain food because phosphorus is found in fish to a very large extent. This is not so. A great many advertisements set forth the advantages of cereals as brain food. These are also mistakes. The best brain foods are cold fats and vegetable oils. I consider one of the most important articles of diet that we can

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possibly have in this country to be cotton seed oil. It is one of the best fats, and much more healthful than lard. If persons would use more olive oil they would be a great deal better off. There are lots of ways in which they can take olive oil without its being unpleasant for them. I consider oleomargarine much more healthful than butter. Butter may contain, during its manufacture, products of decomposition, and unless the butter is of the best possible quality it may often do a great deal of harm. Wheaten food or cereals taken to the exclusion of all else is very injurious to the brain and to the nervous system. It is unwise for anybody to live on a cereal diet to the exclusion of animal diet. If Americans would live more quietly, would not be in such a constant state of rush and excitement, and would eat more food that contained some nourishment rather than living on fancy dishes, there would be a great deal less nervousness, insomnia and general nervous disorders than there are at the present day. This nervousness has only come of late years comparatively, and it is caused by the whirl of excitement in which Americans, and especially inhabitants of large cities, will live. They keep on the go from early in the morning until late at night, when half of that time should have been given up to rest and recreation. They try to crowd in a short space of time all the work they possibly can in order to gain the almighty dollar, and by doing so ruin their health and constitution. Men should rise early in the morning, eat a good breakfast that contains a certain amount of nourishment, and discard all such items as toasted muffins, corn bread, wheat cakes or anything of the kind; rest a little after their breakfast, go through the day's business with as little worry and as little excitement as they possibly can, and after their work is finished in the evening, say from four to six o'clock, according to the time when their business hours close, they should have their dinner, eat slowly and comfortably, and then give themselves up entirely to rest and recreation. They should try to develop other parts of their brain than those which are exercised in following their daily avocations. And then they should go to bed early and get a good night's rest. Attempting to work without proper rest at night is a mistake, and if a man is troubled with insomnia at all he should consult a physician, and have it remedied before any dangerous result arises from it."

SCHOOL SANITATION.

Frequent report is made that children have gone home from school and been taken with diphtheria or scarlet fever, or some other contagious disease, and the inquiry is made whether or not the schools should be closed, as well as other public places.

Experience and observation have demonstrated that unless the disease exists in the form of an epidemic that it is better, safer not to close up the schools. Children as a rule are safer when going to school than during vacation. In the former case they have not time for social and close intervisitation, while in the latter not only the inclination but the opportunity for such visits is greatly increased.

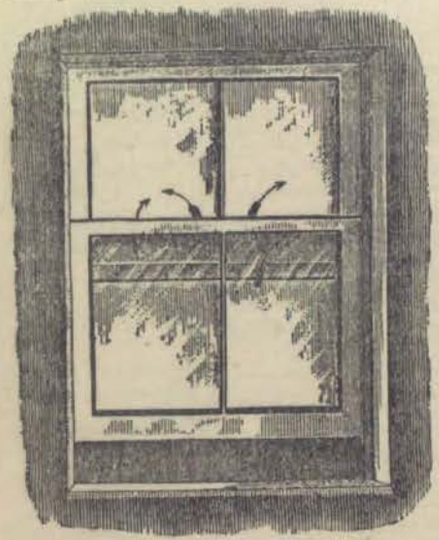
The fact that children are taken with such a disease at school is no evidence that the disease was contracted there. The exposure leading to the attack quite as likely, if not a good deal more so, occurred outside of the school room. Still, there are dangers from exposure in the school room that need to be pointed out and remedied so far as possible.

The dangers to be apprehended are from *contaminated water; sewer gas; over crowding and improper ventilation; the deposit of contaminated sputa upon the floor; the poisoning of the air from exhalations from pupils with diseased throats, nostrils or lungs; and by personal contact.*

The *water may be contaminated* principally by being too near a cess pool, privy vault, defective sewer, or to yards or sheds where animals are kept. Should any discharges from parties having typhoid fever or diphtheria find their way into the water supply they would certainly, even in the most dilute form, produce in those using the water like diseases. This, of course, applies equally to other public buildings, or to private residences. Even should such personal excretions not find their way into a water supply, other diseases are caused by impure water, and the system is rendered much more susceptible to any infectious disease. Hence, the water supply of the school building should be carefully guarded, and if a well furnishes the water, it should be cleaned out at least twice a year, and should in no case be nearer than two hundred feet to any possible source of contamination.

Sewer gas in cities is a frequent source of danger in our school buildings. Not only the air breathed, but water drank may, by absorption of poison germs, be productive of sickness. The plumbing should be the best and most improved kind, and should be frequently looked after.

Over crowding and improper ventilation are among the most frequent sources of air pollution; and this danger is as great in the village and country as in the city school house. Every school room that is to be occupied for six hours of each day should afford at the very least two hundred and fifty cubic feet of air per hour for each pupil; and in addition at recess, noon, and after dismissal in the evening, should have the doors and windows thrown open so far as possible consistent with the preservation of a proper temperature. There is no disinfectant more valuable than an abundance of pure air. Children and their parents often conplain of the school room being too cold, or of windows being thrown open so that cold currents of air passed freely over them. A little tact on the part of the janitor or teacher would obviate any such complaint. A window or door, in cold weather, so far as possible, should never be thrown open on the side of the building against which the wind is blowing. Such a practice will almost always result in the children taking severe colds. The openings should be made on exactly the opposite side, and even then the windows should be provided with a board four to eight inches wide that would fit snugly under the lower sash when it is raised. The air would then be admitted at the junction of the two sashes and passing up between the lower and upper sash no current could take place.



Showing manner of ventilating by inserting strip of wood beneath lower sash of window.

School Sanitation.

If a child should be in the school room with pulmonary consumption, or with the sore throat found in diphtheria, scarlet fever, whooping cough, or measles, there is always *danger from the sputa* (the expectorated matter) that is thrown off, *and from the air* that is poisoned in its passage from and over these diseased tissues. As a matter of course, such children should not be admitted to the school room where it is known that these diseased conditions exist. There is always some danger, however, from the possibility of the presence of such. Under such circumstances the ventilation, and sufficient air capacity above referred to, would be invaluable. In addition, however, to this, the school room floor should each evening, the windows being thrown wide open, be liberally covered with saw dust freely saturated with a strong solution of carbolic acid, and then carefully swept up and the sweepings should be thrown into the stove or furnace and burned. This saw dust and the careful sweeping would gather up all the dust and sputa on the floor, and prevent its diffusion subsequently through the room by drying.

Spitting on the floor should be prohibited in a school room.

The proper temperature of a school-room is 65° to 70° Fahr. To determine the temperature a thermometer should be hung not more than four feet above the floor, and away from the stove. Occasionally the floor air should be tested. Keep the floor warm.

If a coal stove is used, when the door is opened close the draft at the bottom to prevent the escape of gas into the room, which causes dullness and headache.

If the school-room was known to have had in it a case of infectious disease the school should at once be dismissed, and the room thoroughly disinfected by fumigation with sulphur, and by subsequent free ventilation. For this purpose, it would not be necessary to close the room for more than one session.

The danger from *personal contact* may be greatly lessened by having a seat for each individual scholar. In many school houses the seats are so arranged that the pupils sit in pairs, and are thus during the entire session thrown quite close together. Such seating not only subverts the best discipline, but is very objectionable from a sanitary point of view. Should any infectious disease exist in the one, the companion would be most likely to contract the disease if at all susceptible. The teacher, if affected with any

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infectious disease of the throat or lungs, would greatly endanger the little ones by kissing them as many are in the habit of doing.

To carry out all the above suggestions would cause a good deal of additional care on the part of teachers, and some expense on the part of school boards, but it would save many weary vigils, many broken hearts, many dollars and cents to the patrons of the school, beside inculcating some valuable lessons to the pupils, teachers and patrons in sanitary science and hygiene that would be practical in character, and lead to more healthy homes. School boards should bear in mind that they have in trust all that relates to the school. They should bear in mind the protection of life and health is a part of education, involving all the facilities for such. They should, by all possible means give the child a fair chance for health and usefulness. No one can do more for the welfare of the child in school, and in molding public sentiment than they.

To secure men and women with sound bodies, fitted for labor, with good character, and mental endowments sufficient for some useful vocation, school boards should plan generously and judiciously, that the commonwealth, for its expenditure of means, may be rewarded with good citizens, happy families, prosperous homes, and industries.

NEEDED SCHOOL REFORMS.*

As chairman of the State Board of Health Committee on Education and Schools, I submit to the Governor these reflections: I trust he will weigh them as particularly as their importance demands, and as it is customary with him to consider all questions; and then, that he will find it to be "very meet and proper" to recommend to our legislature in his annual message that the reforms herein proposed be made the law of the State.

These have the sanction of numerous professional educators of varied experience and ripe accomplishments, as well as of cultured medical men generally, for as much as they are based upon

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the unerring laws of physiology, one of the exact sciences, and at the same time harmonize with the practical spirit of these materialistic days.

THE SCHOOL AGE.

Considering that the brains of young children are immature, are, in other phrase, in a stage of transitional development, and are not capacitated to bear persistent study without more or less injury, it stands to reason that no child under the age of *seven* should be eligible to the public school.

If an infant must be sent to school, temporarily, to relieve some overworked mother of its proper care, let it be to the kindergarten, the coming infant school, where the little one's unfolding brain is amused, but not overtasked, by a judicious course of instructive games and easily grasped object lessons, simple gymnastic exercises, and the singing of childish songs.

The State law, I believe, establishes *five* years as the school age. In doing this it has unwittingly violated a known physiological law, to the disadvantage of the race. The increase in the population of the State has changed the conditions, which seemed, at the date of the enactment of our school law, to make infant schools of the public schools, and the time has come for such a change in the school age of children as will do honor to Iowa, and place her abreast of other commonwealths, in which loyalty to the physiological law is well illustrated.

It is known, as has been explained to me by an expert—that is to say, by the distinguished Prof. Edwards, the editor of the "Iowa Normal Monthly"—that in the early days of the State, when the foundations of our admirable public school system were laid broad, deep and enduring, the sparseness of the population made the establishment of five years as the school age a necessity, because the resultant increase in the maximum of the per capita allowance rendered possible the founding of schools in localities where, without such increase, they could not have been maintained. That per capita, which at first was about $1.08, has now, with the advance in school land values consequent upon the increase in population, together with the phenomenal development of means of intercommunication, reached the sum of $1.46, and still advances.

Needed School Reforms.

Of course, the financial aspect of the proposed reform, will influence many, and the question will be asked: "How will the present income of school districts, to which the school methods have been adapted, be effected in the event of the elimination of at least one-fourth of the beneficiaries from the aggregate, upon which aggregate the allowance to each district is based?"

The answer to this pertinent query seems to be found in the averment that it would be the duty of the legislature to couple with the statutory reform in the school age the proviso that nothing thus done should operate to reduce the allottment of monies to each district.

Under such a proviso, no enlarged drafts would be made upon the school fund, for it would simply increase the per capita allowance to the remaining three-fourths of the beneficiaries, and the aggregate expenditures would not be enhanced at all. Beside, the accomplished reform in thus enlarging the per capita, would place it in the power of each school district to expand its teaching facilities in the way of needed school paraphernalia, gymnastic and other. Above all, the reform would markedly reduce the strain to which our teachers are now subjected in the villages and cities of the commonwealth.

SCHOOL HOURS.

In connection with the foregoing, there should be a change made in the matter of the hours which children between the ages of seven and ten years are expected to spend in school.

Here, again, we find the physiological law to be worthy of study and obedience. Reflecting medical men, and educators of discernment and experience, unite in the opinion that the law aforesaid is widely broken, and broken to the hurt of the subject, if children between the ages of seven and ten years are imprisoned in school over three hours each day.

A child ten years old, with its immature brain; its feebler powers of application to books; its liability to injury from being held, unduly, to the performance of mental labor, should never be kept in school the same number of hours as one fifteen years of age, whose capacity for brain work is fifty per cent greater.

It is an inerrable physiological law that mental endeavor not in line with the powers of the human system, adds nothing to the

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result. Hence, a child will accomplish as much in half-time at school, in the long run, as he would had he been kept at his desk the regulation six hours.

Experience fully substantiates this proposition, and indicates the law.

It is no argument in favor of the full time heresy to say that a child under ten years of age must be kept six hours a day in school, because of a harassed mother's desire to be relieved of its disturbing company. And yet this plea for persistence in statutory tyranny will be gravely made by many of the lay public, who are blind to duty simply because they decline to see.

Childhood is the age of cyclonic changes of position and phenominally healthy lung power. To exploit these erratic muscular movements, and these "windy suspirations of forced breath" is as necessary to the healthy child, as is the air he breathes, or the food he eats. Within proper limitations the child should be granted his rights in this direction by the parent, as a means to the end of health. That parent who constantly represses these habitual, and often annoying, illustrations of his child's law of being, wrongs himself and his offspring, who is best governed in these matters when treated with a little wholesome neglect.

It follows, therefore, that to deprive an active child of these physiological helps to physical progress, for an undue length of time each day in school, is precise and un-American tyranny, and is a sad violation of hygienic laws.

Further, and to conclude: The change in the school age, beside the hygienic blessings conferred upon the child, would relieve in part the strain upon the self-sacrificing women teachers, which is now burthening so many homes with hopeless invalids.

Half-time for children between the ages of seven and ten, means to our cities, whose schools are always overcrowded, fifty per cent increase in their spheres of influence. The results achieved in England and some of our sister States (notably Massachusetts), where elaborate trials of the half-time system have been made, amply prove that the child learns as much under the three as under the six hour a day regulation. These facts admonish our legislators that the law of physiology, as applied to the proposed reforms, which law is one expression of the law of God, should not longer

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be "more honored in the breach than the observance," in the Hawkeye State.

Our public men in the early days really "builded wiser than they knew," when they put into the State's organic statutes the enlightened and flexible school law. The seed then so thoroughly sown, has had a resultant, perennial harvest, whose value is beyond any powers of computation known to man, because that harvest is for eternity as well as time. But that school system, grand and effective as it is to-day, is instinct with the law of growth. It is capable of indefinite expansion like all the institutions of this free land. We should not, therefore, rest content with present achievements, noble as they are, but should be swift to embody in our educational polity any and all improvements which the unresting spirit of progress discovers and experience approves. Communities, as well as individuals, in this day of enlightenment, should not be satisfied with existing attainments, but rather should strive for greater results. Earnestly and effectively should this teaching be applied to our public school system, and especially so when, at this era in our history, ruthless hands are raised to pull down this citadel of freedom, this only platform on which, in our nation, the children of sires of diverse nationalities and creeds, can meet on liberty's level, and be blended and compacted into the full stature of American citizenship—a citizenship hostile to sectarian domination, or to any other unhallowed manipulation of our God-given rights.

CONSUMPTION.

Consumption, or as it is called, phthisis, or tuberculosis of the lungs, is the greatest destroyer of human life the world has known. The terrible ravages of all the plagues and epidemics that have swept over peoples and continents from time to time, form no comparison with the death pall that marks the insideous path of consumption. It respects neither age, sex nor condition. The rich, the poor, in the palace and in the hovel; the untutored Indian in

the forest; the native in the wilds of Africa; the refined and cultured, all, go down beneath the stroke of its most relentless hand. It is also the most deceptive foe of human kind. With its occasional cough, and hectic flush, counterfeiting the very bloom of health, it entwines its fatal tendrils around the heartstrings and saps away the life.

This disease has been known since the time of Isocrates, five hundred years before Christ. He, together with Aristotle, Hyppocrates, Galen, Riverius, Morton, Morgagni, Cullen, Reid, Raulin, Valsalva, Darwin, Baume, and all medical writers down to about one hundred years ago, taught that it is a contagious disease. About the beginning of the present century, a reversed opinion set in which has since prevailed until within the past few years, during which time most careful research and observation have been had by the most eminent scientific minds of the world.

On the 24th of March, 1882, Dr. Koch, at Berlin made known his discovery of the *Bacillus tuberculosis*; since when, his conclusions have been tested and verified again and again, until this micro-organism is established beyond question, and at the same time it abrogates entirely the theory of heredity of the disease.

The disease was introduced into America from England. History will warrant the statement that through the seventeenth and eighteenth centuries England was a propagator of consumption throughout the world. Wherever an English colony settled, consumption soon appeared.

SOURCES OF INFECTION.

The source of infection is through tuberculous animals, and from man to man. Nearly all authorities now agree that tuberculosis in animals and man is identical, and that it is communicable from animals to man, and back again from man to animals, in every possible form. The greatest source of infection from animals is in the use of milk from diseased cows, because milk is generally used in uncooked condition.

The greatest source of infection is from consumptive human beings—from the sputum. This material, which is coughed up and thrown off, sometimes in large quantities, contain the *Bacillus tuberculosis*, or germs of this disease in enormous numbers, harmless so long as it is moist, but after being expectorated it dries, as

on the streets, floors, carpets, clothing, furniture, handkerchiefs, etc., becomes dust to float in the air, and is inhaled by the lungs, or taken into the system with food and drink.

It has been shown experimentally, that dust collected from the most varied points, in hospital wards, asylums, prisons, private houses, etc., where consumptive patients are present or have been present, is capable of producing tuberculosis in animals when used for their inoculation. Such dust may retain for weeks its power of producing disease. On the other hand, dust collected from rooms in institutions or houses that have not been occupied by tubercular patients does not produce the disease when used for the inoculation of animals.

These observations show that where there are cases of pulmonary tuberculosis, under ordinary conditions, the dust surrounding them often contains the tubercle bacilli; and persons inhaling the air in which the dust is suspended may be taking in the living germs. It should, however, be distinctly understood that the breath of tubercular patients and the moist sputum, received in proper cups, are not elements of danger, but only the dried and pulverized sputum. If all discharges were destroyed at the time of exit from the body, the greatest danger of communication from man to man would be removed.

But, says the heredity theorist: Is it not a fact that whole families, parents and children, all die of the disease? To which answer is made, that such may be, and often is, the fact, but a careful study of the history of such families will prove most conclusively the contagiousness of the disease. We know that some persons, and even families, will not become infected with diphtheria, scarlet fever, and even small pox, under the most direct exposure. Does this prove these diseases non-contagious? It is a fact, known to every observant physician, that some families and persons have a predisposition to certain diseases, while others resist them. This predisposition undoubtedly may be transmitted, but that a disease, foreign to the body, can be transmitted, is contrary to physiological law. Parents may impart to their offspring a condition of the blood or nervous system that will render them susceptible more or less to various diseases, but they cannot transmit specific disease germs that will at some future period of life, develop and destroy them.

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Consumption is ancient, but it never existed among a people until it was brought to them. It had no existence in America until the Englishmen brought it here. It was unknown among the Indians until the advent of the white man. If heredity be true, then, in every consumptive family the members should succumb in the order of birth, which is never the fact. Some succumb irregularly as to birth; others escape entirely.

It is a matter of record that in countries and localities resorted to by consumptives for climatic reasons, the disease increased so as to cause them to be shunned. Such has become Santa Rosa, California, and many places in Colorado. The disease is increasing among the citizens of Denver, which has become a popular resort for consumptives. Like all contagious diseases it takes rapid hold on new material. At the risk of appropriating a good deal of space to one subject, herewith is presented an extract from an article published in the official organ of the Government Marine Hospital Bureau, the "Abstract of Sanitary Reports" for June 13, 1890. The article is a translation from *La Rivista Internazional L'Igiene*, Naples, May, 1890. The experiments show that the bacilli of consumption may be found in dead bodies after twenty-five years' interment! Read what is said about the infectiousness of the bacilli; what is said about the repeated drying and moistening of the sputum of consumptives and their effect upon the vitality of the bacilli therein; what is said about the penetration of the bacilli into the tissues; and what is said about milk and meat from tuberculous cows and their ability to communicate the tuberculous affections by this means. It is possible that all the statements made have not been sufficiently demonstrated, and yet so much *has* been demonstrated that these declarations, claiming as they do to be the results of patient investigation, are entitled to serious and practical consideration. The article entire is as follows:

At the Heidelberg congress of German naturalists and physicians, Schottelius stated that some years ago he instituted a series of experiments with tuberculous lungs interred in a wooden box at a depth of five feet, the usual mode of sepulture of bodies. After two years and a half he removed from the earth a quantity of tuberculous bacilli, for the most part spore-producing. From this material he obtained pure cultures which furnished positive results in eighty per cent of his experiments in inoculation. He is now engaged in investigations with the object of ascertaining whether the virulence resides in the bacilli taken from the soil or in their spores. Soyka

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expresses the opinion that the greater number of the bacilli perish, but that some possess durability and may recover their virulence under favorable conditions. Gartner has observed bacilli in a cemetery abandoned for twenty-five years.

As a practical outcome of his investigations Schottelius advises the disinfection of bodies of persons dead from infectious diseases.

Gebhardt has experimented on the sputum of consumptives, his object being to test the virulence of the sputum in different grades of dilution, and to ascertain whether the potentiality of the tuberculous virus is essentially modified by the organ first infected—that is to say, by the manner of infection. With this object he practiced hypodermic and intraperitoneal inoculation and experiments in inhalation and alimentation, and ascertained that the subcutaneous connective tissue, the peritoneum, and the lungs are inclined to receive and multiply the tuberculous virus in about an equal degree, while the digestive apparatus offers resistance. Hence tubercular virus may, especially in small quantities, pass through certain organs without provoking local alterations. As the point of ingress is not always the seat of the disease, pulmonary tuberculosis is not always to be attributed to infection by inhalation.

Sputum which contains bacilli is enormously infectious, retaining its virulence even in dilution of 1:100000 apparently without regard to the manner of infection. The virulence of the sputum being in proportion to the quantity of bacilli present, Gebhard employed pure cultures of the bacilli of tuberculosis, on the hypothesis that equal quantities of the same culture contain equal quantities of bacilli. With a subcutaneous inoculation of 1 C. C. of a dilution in the proportion of 1:400000 and an inhalation of 0.5 C. C. of the same dilution in a culture of agar-agar he obtained positive results. Hence the pure cultures retain their virulence when enormously diluted.

Malassez and Vignal desiccated the sputum of tuberculous, moistened it with water, again desiccated and pulverized it, and this repeatedly, endeavoring to realize, so far as possible, the condition to which the sputum daily ejected in our streets is subjected. After successive desiccation and humectation the bacillus of the sputum retained all its virulence.

With regard to the penetration of tuberculosis bacilli into the organism, Dobroklonski states, as the results of his experiments in the Cornil laboratory at Paris, that tuberculosis may attack the organism by way of the digestive apparatus. For this infection to occur, no lesion of the intestinal wall, epithelial desquamation, local modification, nor anterior inflammation is necessary. The tuberculous virus (bacilli and spores) may easily traverse the completely normal epithelial lining of the intestine, but it does not determine inflammation unless it remains for a length of time in contact with the intestinal wall. Dobroklonski asserts that the tuberculous spores and baccilli do not penetrate the organism by any fixed means, but that they are carried by the current of the lymphatic system, and being arrested by the tissues, determine in them the formation of tubercules.

As a natural inference from Hirschberger's experiments demonstrating that tuberculous cows, or cows infected with tubercular phthisis, produce

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in fifty-five per cent of cases, infectious milk, it was supposed that milk from large dairies would contract virulent properties from the infectious milk of one tuberculous cow. A series of experiments, conducted by Gebhardt, under the direction of Bollinger, in the Pathological Institute of Monaco, show that tuberculous milk loses its virulence at a certain dilution. The mixing of milk practiced in large dairies, diminishes the danger, and in most cases renders the milk innocuous. Milk served by large dairies is always to be preferred to the continued use of milk from the same cow.

Studies in the transmission of tuberculosis from animals to men by means of tuberculous milk directed the attention of hygienists to the derivatives of milk, the most important of these being butter. Gasparini inoculated guinea pigs with butter containing the bacillus of Koch, and by microscopic observations verified tubercular lesions in almost all cases.

Dr. T. Mitchell Prudden, of New York, one of the most noted bacteriologists in this country, says: "A great deal of misery and wearing apprehension have been caused in the years which are past, by the widespread notion that consumption may be inherited. Modern researches show that this notion is not well founded. It is true that there is a subtle make-up of the body cells in certain persons, some entirely mysterious nutritive condition, which renders their bodies especially favorable for the growth of the tubercle bacillus, and that this indefinite and ill-understood peculiarity may be inherited. But that is all. If the tubercle bacillus can be kept away from them, even predisposed persons cannot get consumption, for this disease without the bacillus cannot exist, and the bacillus does not so far as we know, pass from the mother to the unborn child. * * When the tubercle bacilli get into the bodies of predisposed individuals, and begin to grow, they stimulate the tissues about them so that little new-formed masses of cells appear about them, and among the growing germs, these cell masses are called tubercles. Sometimes larger masses of new cells are developed, which replace considerable portions of the tissues and organs in which the bacilli have lodged. After a time, especially in the lungs, the newly formed tissue, containing sometimes enormous numbers of the living tubercle bacilli, gradually disintegrates or breaks down, and this broken-down germ laden material may then be discharged with the mucus from the bronchial tubes day after day in considerable quantities, for months or even for years, in the expectoration; new bacilli forming as fast as the old are discharged, and sometimes even much faster; * * *

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This then is the great primary fact, which is of extremest significance to us in our present study; namely, *that every person suffering from consumption of the lungs, may be expectorating every day, myriads of living and virulent tubercle bacilli, and that the life and virulence of these bacilli are not destroyed by prolonged drying.* * * *More proof than is in our hands is hardly needed, that in a very large proportion of cases, in inhabited regions, the infection or germ of tuberculosis is conveyed from sick to well persons by means of the material discharged from the lungs, which is allowed, from carelessness or ignorance, to dry and finally mingle with the floating dust.* While thus tuberculous persons may be a constant source of danger to their healthy fellows, it is by no means true that they always are or ever need to be. *The breath itself, the exhaled air of consumptives, no matter how seriously ill, is not dangerous, it carries no germs.* It is only the solid discharged material of the sputum which carries the danger. And this sputum moist and usually adherent as it is when fresh, is only dangerous, so far as contamination of the air is concerned, when it is permitted to dry. * * * The way, then, to most efficiently stop the prevalence of this *distinctly preventable* disease is evidently to see that the sputum of consumptives is properly disposed of. * * The reason why the use of cloths or handkerchiefs for the reception of the expectoration, in consumption, should be as much as possible avoided, is that on these the material very readily dries, and, becoming detached with or without the minute particles of fabric, readily floats off in an inpalpable condition into the air. For the same reason great care should be exercised by consumptives, to avoid the soiling by sputum of woolen garments, from which very fine fiber particles are always very readily detached, and would carry with them dried particles of germ-laden material, should such have been allowed to fall upon them. But if cloths must be used, as will often be the case, either to receive the expectoration or for wiping the mouth, they should be such as can be as speedily as possible burned with their contents. When handkerchiefs are used, they should be as early as possible, boiled for a full hour, in a receptacle by themselves, before they are washed in the ordinary way. Cheap paper cups are now made which should be placed in all apartments frequented by consumptives, and frequently changed and with their contents burned."

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"Consumption is at best, if it has any best, a most distressing and deplorable malady. But when we have learned, as we have within the last decade, that the chances of recovery are often very good indeed; that it is not hopeless, as was formerly believed; that it is not inherited; when we appreciate that with due care the stricken one need not in the least be a source of danger to others, even to his house-mates; when we fully realize that the appalling prevalence and mortality of the past has been due to ignorance of the nature of the disease and the mode of its transmission, we should be able to appreciate how much we owe of comfort and hope to the investigations in scientific medicine, which have given us all this, if they have not yet brought to us such means as will directly cure the disease in individuals, when once firmly established."

DANGER FROM MILK FROM TUBERCULOUS COWS.

How far a cow may be tuberculous before her milk becomes dangerous as an article of food has been the subject of much experiment and observation among scientific men the world over. The opinion has largely prevailed that there was no danger in the milk if the mammary glands were not affected. To settle this very important question Dr. H. C. Ernst, under the auspices of the Massachusetts Society for Promotion of Agriculture, assisted by Drs. Austin Peters, Henry Jackson and Langdon Frothingham, made an exhaustive series of experiments and tests, which are reported in the transactions of the Association of American Physicians, volume 4, 1889.

For experimentation ten cows were selected, in none of which were the udder affected with tuberculosis, thirteen calves, fifty-seven rabbits, seven pigs of one litter from a healthy sow, and several guinea pigs. The experiments were conducted under the most careful precautions that could be devised. The animals were all separated and kept under close watch, but in healthy surroundings.

In the experiments of feeding the milk the successful results were forty per cent, and from inoculation fifty per cent. The microscopical tests showed that the presence of the baccilli of tuberculosis in the milk from these cows was 28.57 per cent.

The experimenters conclude their report with the statement that the results show:

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1. Emphatically that the milk from cows affected with tuberculosis in any part of the body may contain the virus of the disease.
2. That the virus is present whether there is disease of the udder or not.
3. That there is no ground for the assertion that there must be a lesion of the udder before the milk can contain the infection of tuberculosis.
4. That on the contrary, the bacilli of tuberculosis are present and active in a very large proportion of cases in the milk of cows affected with tuberculosis, but with no discoverable lesion of the udder.

A remarkable incident in this connection is the absence of other contagious diseases among consumptive persons. Dr. Welch, of the Philadelphia Municipal Hospital, says of the five hundred cases of small pox he has seen, there was not one in which there was well marked consumption.

Dr. Taylor, of the Philadelphia Health Board, says that in his experience with contagious diseases of every kind, he does recollect a single case of other contagious disease in a person suffering from consumption.

Dr. M. Longstreath, Pathologist to Pennsylvania Hospital, says that during twenty years' connection with that institution he has never found consumption in an autopsy for typhoid fever.

Dr. Lawrence F. Flick, of Philadelphia, in Transactions of the Pennsylvania State Medical Society (1888), says: "Another mark of contagious diseases is that, while in active progress they will not tolerate the active presence of any other contagious disease. As regards consumption, I have been unable to find a single authenticated case in which any other disease was concomitant."

PREVENTION.

Consumption being a contagious disease, it is therefore a distinctly preventable disease. Pertinent to the best means for prevention is the report of the Committee of Pathologists of whom the eminent bacteriologist and sanitarian Dr. T. Mitchell Prudden is a member, to the health department of the city of New York, in which the committee says:

We now know that tuberculosis can only be caused by the entrance of the germ into the body; and that this transmitted liability simply renders

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the individual a more easy prey to the living germs, when once they have gained entrance. The frequent occurrence of several cases of pulmonary tuberculosis in a family is then to be explained, not on the supposition that the disease itself has been inherited, but that it has been produced after birth by transmission directly from some affected individual. Where the parents are affected from tuberculosis the children from the earliest moments of life are exposed to the disease under the most favorable condition for its transmission; for, not only is the dust of the house likely to contain the bacilli, but the relationship also between parents and children, especially between the mother and the child, are of that close and intimate nature especially favorable for the transmission by direct contact.

If, then, tuberculosis is not inherited, the question of prevention resolves itself principally into the avoidance of tubercular meat and milk, and the destruction of the discharges, especially the sputum of tubercular individuals.

As to the first means of communication, those measures of prevention alone answer the requirements which embrace the governmental inspection of dairy cows and of animals slaughtered for food, and the rigid exclusion and destruction of all those found to be tubercular.

For the removal of the second means of communication, *i.e.*, the sputum of tubercular individuals, the problem is simple when the patients are confined to their rooms or houses; then wooden or paste-board cups with covers should always be at hand for the reception of the sputum. These cups are supported in simple racks, and at least once daily or more freqently if necessary, should be removed from the racks and thrown with their contents into the fire.

The disposition of the expectoration of persons who are not confined to their rooms or houses is a far more difficult problem. The expectoration certainly should not be discharged on the street, and the only practicable means for its collection seems to be in handkerchiefs, which when soiled should at the earliest moment be soaked in a solution of five per cent of carbolic acid and then boiled and washed. Handkerchiefs thus soiled are exceedingly dangerous factors in distributing tubercle bacilli; for when the sputum becomes dry it is easily separated in flakes from the cloth, and then becomes pulverized and suspended as dust.

It becomes evident from what has been said, that the means which most certainly prevent the spread of this disease from one individual to another, are those of scrupulous cleanliness regarding the sputum. These means lie largely within the power of the affected individual. It is furthermore to be remembered that consumption is not always, as was formerly supposed, a fatal disease, but that it is in very many cases a distinctly curable affection.

An individual who is well on the road to recovery may, if he does not with the greatest care destroy his sputum, diminish greatly his chances of recovery by self-inoculation.

While the greatest danger of the spread of the disease from the sick to the well is in private houses and in hospitals, yet if this danger is thoroughly appreciated, it is for the most part quite under control, through the immediate destruction of the sputum and the enforcement of habits of cleanliness.

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But in places of public assembly, such as churches and theaters, particularly the latter, the conditions are different, and the safety would seem to depend largely upon a dilution and partial removal of the floating and possible dangerous dust by means of adequate ventilation.

Rooms in private houses and hospital wards that are occupied by phthisical patients should from time to time be thoroughly cleaned and disinfected, and that should always be done after they are vacated and before they are again occupied by other individuals.

Steamship companies should be obliged to furnish separate apartments for consumptive persons, so that no person in the exigencies of travel need be forced to share his room with one who might be a source of active danger to him.

We desire to especially emphasize the following facts:

1. That tuberculosis is a distinctly preventable disease.
2. That it is not directly inherited; and
3. That it is acquired by the direct transmission of the tubercle bacillus from the sick to the healthy, usually by means of the dried and pulverized sputum floating as dust in the air.

The measures then, which are suggested for the prevention of the spread of tuberculosis are:

1. The security of the public against tubercular meat and milk, attained by a system of rigid official inspection of cattle.
2. The dissemination among the people of the knowledge that every tubercular person may be a source of actual danger to his associates, if the discharges from the lungs are not immediately destroyed or rendered harmless; and
3. The careful disinfection of rooms and hospital wards that are occupied or have been occupied by phthisical patients.

Upon the report of this committee the Health Department issued the following regulations:

HEALTH DEPARTMENT, CITY OF NEW YORK,
301 MOTT STREET, July, 1889.

Rules to be Observed for the Prevention of the Spread of Consumption.

Pulmonary tuberculosis (consumption) is directly communicated from one person to another. The germ of the disease exists in the expectoration of persons afflicted with it.

The following extract from the Report of the Pathologists of the Health Department explains the means by which the disease may be transmitted:

Tuberculosis is commonly produced in the lungs (which are the organs most frequently affected) by breathing air in which living germs are suspended as dust. The material which is coughed up, sometimes in large quantities, by persons suffering from consumption, contains these germs often in enormous numbers.

This material when expectorated frequently lodges in places where it afterward dries, as on the streets, floors, carpets, handkerchiefs, etc. After drying in one way or another it is very apt to become pulverized and float in the air as dust.

Consumption.

By observing the following rules the danger of catching the disease will be reduced to a minimum:

I.

Do not permit persons having consumption to spit on the floor or on cloths unless the latter be immediately burned. The expectoration of persons suspected to have consumption should be caught in earthen or glass dishes containing the following solution:

Corrosive sublimate, 1 grain.
Water, 1 pint,

and finally thrown into the sewer or burned.

II.

Do not sleep in a room occupied by a person who has consumption. The living room of a consumptive patient should have as little furniture as practicable. Hangings should be especially avoided. The use of carpets and rugs ought always to be avoided.

III.

Do not fail to wash thoroughly the eating utensils of a person who has consumption as soon after eating as possible, using boiling water for the purpose.

IV.

Do not mingle the unwashed clothing of a consumptive person with similar clothing of other persons. The soiled clothing of a consumptive person should be removed at once, put in boiling water for forty-five minutes, or otherwise disinfected.

V.

Do not fail to catch the bowel discharges of a consumptive person with diarrhœa in a vessel containing corrosive sublimate one grain to water one pint.

VI.

Do not fail to consult the family physician regarding the social relations of persons suffering from suspected consumption.

VII.

Do not permit mothers suspected of having consumption to nurse their offspring.

VIII.

Household pets (animals or birds) are quite susceptible to tuberculosis, therefore:

Do not expose them to persons afflicted with consumption; also do not keep but destroy at once all household pets suspected of having consumption, otherwise they may give it to human beings.

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IX.

Do not fail to cleanse thoroughly the floors, walls and ceiling of the living and sleeping rooms of persons suffering from consumption, at least once in two weeks.

By order of the Board.

CHAS. GEO. WILSON, *President.*

EMMONS CLARK, *Secretary.*

The contagiousness of this disease may be dangerous to the public schools, and the presence of consumptives in the school room may endanger the lives and health of fellow pupils. As a protective measure persons known to be affected with pulmonary consumption should be excluded from schools, colleges and other institutions of learning until such recovery from the disease is had that there is no cough nor expectoration.

The great source of danger is the expectoration of the consumptive, from the lungs. It swarms with the disease germs, which are very tenacious of life. Drying does destroy their vitality. Painful as it may be, the consumptive should be impressed with the fact that he is a source of infection to his family and friends, as well as to the public; also, that the expectoration or sputum is dangerous, and must be properly disposed of. It should be received into a spit-cup or spittoon, in which is a little water, and must never be spit upon the floor or carpets, or received in handkerchiefs.

If it is necessary to use handkerchiefs occasionally with the sputum, they should be boiled before the sputum becomes dry.

In the house a small paper cup can be used, set inside an earthen or metal cup. The paper cup should be burned each day. The cup should be kept covered against access by flies. If spittoons are used they should be of such shape that the sputum will fall into the water without touching the sides of the vessel. It should be thoroughly cleansed once or twice each day with boiling water and potash soap. If there is house drainage the contents may be emptied into the water closet; if not, they should be burned. They should never be thrown upon the ground near a dwelling, nor manure heaps, where animals may get at them, nor where they may soil animal food.

No boxes or vessels filled with saw dust should be used.

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When away from home a spit-flask containing a small quantity of five per cent solution of carbolic acid may be used.

The floors, wood work, furniture of a room in which a consumptive patient stays should never be dusted, but wiped with a moist cloth.

A consumptive should absolutely refrain from nursing her babe, not because her breath is dangerous, but because the disease may be easily transmitted by kissing the babe on the mouth, as many mothers do. As it has been demonstrated that the use of milk from tuberculous cows produces tuberculosis in animals, it is apparent at once that a mother with consumption may transmit the disease to her offspring by nursing.

A consumptive person's clothing should be scrupulously kept, and washed apart from all other clothing, and be thoroughly boiled.

When a consumptive person dies, the clothing and bed clothing previously used should be boiled. The room and furniture should be washed with a corrosive sublimate solution. If the walls are papered the paper should be wet with a disinfecting solution, then entirely removed and the walls repapered. The room should then be thoroughly exposed to fresh air and sunshine for several days.

Consumptive patients should not be permitted to expectorate on the floor of railroad cars or other public conveyances.

The dissecting room of medical colleges, reveals many cases, of persons who have died from other causes, have had consumption and recovered. Like instances are recorded in the practice of many physicians.

The tendency to recovery is greatly enhanced by the agency of regular life, nutritious food, vigorous exercise without fatigue, and abundance of pure air.

Upon the benefit of pure air exercise, Dr. H. I. Bowditch, of Boston, one of the most eminent sanitarians in this country, in an interesting paper read before the American Climatological Association, gives some interesting personal observations. He says that his father at thirty-five years of age, had all the signs of consumption: cough, hemorrhage from the lungs, diarrhœa, fever, emaciation and great debility. In this condition he set out on a tour through New England, traveling in a chaise with a friend for a companion, and a driver.

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At the end of the first day's travel he was so much exhausted by hemorrhage that his friend was advised to take him home to die. He, however, persisted in his effort, and every day brought him added strength. He traveled on this tour seven hundred and forty-eight miles, and returned home greatly improved in every respect. He lived thirty years after this, dying at the age of sixty-five years of cancer of the stomach. It was his custom during these thirty years to walk two or three times daily from one and a half to two miles.

Further, Dr. Bowditch says his father married his cousin, who died after many years of infirmity, of consumption. There were eight children as a result of this union, six of whom reached adult life. According to all laws of heredity it would be expected that at least there would be a marked pre-disposition to lung disease. The facts show, however, that of ninety-three children and grandchildren *not one showed the least trace of consumption.*

The doctor believes this condition was the result of his father having required all his children to take all the exercise out doors possible, knowing the great benefit that had come to him from such a course.

He says: "If any of us, while attending school were observed to be drooping, or *made the least pretense* even of being not *exactly well*, he took us from school, and very often sent us to the country to have farm life and out of door play to our hearts' content. In consequence of this early instruction, all of his descendants have become thoroughly impressed with the advantages of daily walking, of Summer vacations in the country, and of camping out, etc., among the mountains. These habits have been transmitted, I think, to his grandchildren, in a stronger form if possible, than he himself had them.

In conclusion he said: "I submit these facts and thoughts for candid, mature and *practical consideration* and *use* in the treatment all are called to make of this terrible scourge in all parts of this Union. For my own part, I fully believe that *many patients now die from want of this open air treatment.*

"For years I have directed every consumptive patient to walk daily from three to six miles, *never* to stay at home unless a *violent storm* is raging. When they are in doubt about going out, owing

to bad weather, I direct them to solve the doubt, not by staying in the house, *but by going out*."

Under the rapid march of sanitary science, there is abundant warrant for the belief that the time is not far distant when consumption will be controlled and prevented as easily and surely as diphtheria or scarlet fever, and that the shadow of the "Great White Plague" will no longer cover the human race.

CROUP AND DIPHTHERIA.

No argument is needed to prove the importance of croup and diphtheria in their relation to the public health. The more than three thousand cases of diphtheria that occur in Iowa every year, with the six hundred deaths resulting therefrom, afford a more practical, and hence more convincing argument. Aside from consumption and pneumonia, diphtheria is the most fatal disease we have in the State. The object in grouping croup and diphtheria is to suggest some points of similarity, if not to prove their identity.

Within the last seven or eight years a wonderful amount of interest has been aroused in regard to the etiology of diphtheria. Bacteriologists have been busy in their various laboratories, with the result that it is now almost universally conceded that the organism producing this disease has been fully identified. If, indeed, the cause is now satisfactorily demonstrated, it will not be hard to prove what, if any, similarity exists between croup and diphtheria, and to arrive at the most efficient methods of prevention and treatment.

The question for the last two or three years has been as to whether the pathogenic germ is a streptococcus or a bacillus.

A very brief review of the observations of bacteriologists on this line will not only be interesting and instructive, but is essential. In 1883, Klebs announced the presence in some cases of diphtheria of a bacillus, and that he believed that the disease was produced by different micro-organisms, because he had observed that the bacteria common in Prague were very different from those seen by him in Zurich. In the same year, (1883), Löffler began the

study of the etiology of diphtheria. In the examination of the membranes of diphtheria patients he found in many cases two species of bacteria, the streptococcus and a bacillus. He was led to believe that the former was only incidentally present, and had but little to do in producing the disease, though its presence might lead to complications. The bacilli that he found were about the length of Koch's bacillus tuberculosis, and about twice as thick, often thickened at the ends. Guinea pigs inoculated with cultures of this bacillus died within two or three days. The bacilli were found at the point of lesion, but not in the blood, nor in the internal organs. Some cases of true diphtheria were observed in which this bacillus could not be found, and one healthy child was found to have the bacillus in its mouth. These facts led Löffler to believe that there were at least two kinds of diphtheria, that in which the streptococci were present, and produced marked necrosis and but little pseudo-membrane, and that in which the bacilli were present, and with them an abundant deposit of pseudo-membrane. From the fact that Klebs had just announced the discovery of the same bacillus, it became known as the Klebs-Löffler bacillus.

In 1884, Emmerich claimed to have discovered the real germ of diphtheria, a short, stout bacillus. After the inoculation of pigeons, mice, and rabbits with cultures from this bacillus, he claimed that a pseudo-membrane was produced in the trachea, and that those thus inoculated usually died; and further that these bacilli were found in the blood and internal organs. These alleged discoveries were not confirmed by others, and were therefore discredited.

Babes in 1886, reported that he had discovered, in cases of pharyngeal diphtheria, croupous laryngitis, and in diphtheria following measles and scarlet fever, the Klebs-Löffler bacillus, and also streptococci.

In 1887, Löffler made another report detailing his observations during the examination of the fresh membranes in ten cases of diphtheria, in which he found the Klebs-Löffler bacillus in all.

Fränkel in the same year, reported a case of diphtheria in an adult, from which he cultivated the streptococcus; and also another adult in whom there was laryngeal and pharyngeal diphtheria, with secondary endocarditis. In these membranes, as well as in the heart lesion, he found streptococci.

Croup and Diphtheria.

In 1888, v. Hoffman, in forty-five cases, found a bacillus in twenty-six cases very similar to Löffler's, but not virulent. Later, from eight new cases he found the true Löffler bacillus in scarlet fever and measles; sometimes virulent, and sometimes not. In eleven cases of healthy children examined, he found the Löffler bacillus present four times.

More recently Roux and Yersin found, in fifteen cases of diphtheria, the Löffler bacillus in all.

In April and May, 1889, Prof. T. Mitchell Prudden, M. D., of New York City, contributed to the American Journal of Sciences a very interesting and exhaustive article on the *Etiology of Diphtheria* from which is condensed the foregoing historical summary. It is well known that Dr. Prudden is one of the most noted and careful bacteriologists of this country, and is an acknowledged authority in Europe. In this paper he gives his observations in twenty-four cases as seen in New York City, twenty-two of which were in hospitals or in children's asylums. He did not find a Löffler bacillus in a single case. The announcement of this result was a source of great surprise, especially in view of the fact that all late European bacteriologists had found it. Löffler himself, fully recognizing the reliability of Prudden as a bacteriologist, and not being able to account for the results of his observations, said: "I do not believe that in North America a form of diphtheria prevails different from that with us. With us the bacilli are found regularly by every investigator; there they are constantly missed. Further investigations must and will clear up this contradiction." Prudden says the following as to what he did, and did not, find: "Now we have found in all but two of the twenty-four cases examined, a distinctly pathogenic species of bacteria, which does not, indeed, induce diphtheria in the animals experimented upon, but does induce allied forms of inflammation. Moreover, we have not found in any of the cases the bacilli of Klebs-Löffler, nor any other to which any significance can justly be attributed." He further said: "I would not be understood to say definitely, that diphtheria, or any other acute infectious disease, cannot be produced artificially in animals. I wish only to call attention to the fact that, so far as the evidence goes, genuine diphtheria, as we know it in man, has not, in my opinion up to the present time, been thus induced."

Croup and Diphtheria.

The bacteria to which Prudden refers as having been found in all but two of the twenty-four cases examined by him, were the streptococci, and because of the uniformity with which they were present, he named them the *streptococci diphtheria*. As an explanation of this remarkable finding, it must be taken into consideration that few of Prudden's cases were uncomplicated. Seven had been preceded by measles, three by scarlet fever, one by whooping cough, and four by erysipelas. One occurred in a child only six days old, and another seven days old. None were reported as being uncomplicated cases of diphtheria; but the fact of their having been found in places where other diseases were prevalent, would seem to have a modifying influence. These observations and conclusions of Prudden were made in 1889.

In 1890, Löffler published a critical review of his experiments and observations respecting the cause of diphtheria, as well as of others up to that date. In that he claimed as favoring his theory, in regard to the importance of the Klebs-Löffler bacilli, in cases of the disease in question, such names as Babes, d'Espine, v. Hoffman, Ortmann, Roux and Yersin, Kalisko and Paltauf, Zardiko, Sorensen, Eserich and Klein; and that he was himself, if possible, more confirmed than ever in his belief, that diphtheria was produced by this bacillus.

During this same year, (1890), Prof. Klein, of London, the most noted bacteriologist of England, made some very practical, as well as interesting, experiments in this line. He found in all his cases the Klebs-Löffler bacillus. He conducted a large number of experiments upon guinea pigs with cultures, or subcultures of this bacillus. In all the inoculations death was produced within a short time, unless the cultures were greatly weakened by age. In no case did he find any of the micro-organisms in the blood or viscera of the animals. His conclusions were: "(1) The animals died from absorption into their systems of a chemical poison; (2) that this chemical poison resulted from the life processes within them, of the bacilli; and (3) that the bacilli when introduced into the groin in a living state multiply there, and produce there the chemical poison in question."

Professor Klein had also an opportunity to examine several cats that had contracted diphtheria from the human subject. In all cases the lungs were the principal organs affected. So, also, in

inoculating cats with diphtheritic membranes from the human subject, the disease was reproduced, but the principal lesions were in the lungs. He says on this point: "I am disposed to consider that the cat is particularly susceptible to diphtheria, though differing from the human being in this, namely, that the local disease occurs generally in the lungs and not in the fauces. Further, I suspect that the contagium of the cat, when this animal infects the human subject, is derived from her diseased lung, and that the cat herself contracts diphtheria by receiving the contagium into her respiratory organs, as well as by way of her alimentary canal."

He also took two young, healthy fresh milk cows, and injected both on the same date with a subculture of the Löffler bacillus, under the skin of the left shoulder. As a result, there was a rise in the temperature by the second or third day. About the same time a tumor was found in each at the point of inoculation, which increased in size for some days. An eruption also appeared on the udder and teats, vesicular, and later pustular; the animals coughed and an examination of the milk showed the presence of the Löffler bacillus. The lymph taken from the vesicles on the udder, also contained the same micro-organisms. One cow died on the fifteenth day, and the other, after refusing food and becoming greatly emaciated and weakened, was killed on the twenty-fifth day. In both cows the lungs, pleura, pericardium, liver, and kidneys were found in a pathological condition. Cultivations from the tumors formed at the point of injection revealed innumerable colonies of the Löffler bacillus, but the presence of no other microbe. While these observations were being made an interesting and significant incident occurred at the Brown Institution, where Klein's cows had been kept. Professor Horseley's laboratory was there, and in a shed near by, he had two cats for laboratory purposes. These cats had been there for three or four weeks, and had previously been apparently in good health. Both suddenly sickened and died, after an illness of from three to four days. After their death Prof. Horseley put into the same shed, within a month, fourteen other cats, all of which sickened, and five of which died. They all had about the same symptoms; watery eyes with some muco-purulent discharge; sneezing and coughing; loss of appetite; pulmonary trouble; emaciation; weakness and death; or a slow recovery. The same pathological appearances were present as in

the cats before referred to, in which death followed inoculation by the Löffler bacillus. One had in the lungs and trachea a true diphtheritic membrane, which under the microscope revealed in the necrotic membrane the true diphtheria bacillus. The cows upon which Prof. Klein was experimenting with the diphtheria cultures, were kept in the stables of the Brown Institution, but quite remote from the shed in which Prof. Horseley's cats were confined. After the inoculation of the cows, and signs of constitutional infection began to develop, Prof. Klein gave strict orders to have the milk from them thrown away. These orders were not fully carried out, a portion of it being fed daily to the first two cats. It was but a few days after this feeding began that these cats sickened and died as above stated.

Inasmuch as this milk had been proven to contain diphtheria germs, and the cats had been in good health before drinking it, and had died soon after, with marked symptoms of diphtheria, the reasonable conclusion was that diphtheria had been communicated to them by the use of milk from the inoculated cows.

The latest important contribution to the etiology of diphtheria, is an article recently published in the *Bulletin* of the Johns Hopkins Hospital, by Professors Welch and Abbott. They report the results of an examination of seven cases of primary diphtheria, and one case of membranous croup. They also had an opportunity of examining two specimens of diphtheritic membrane from patients living at a distance, which had been hardened in alcohol. They found in several of the cases streptococci, but the only species of bacteria they found in all the cases, was the Löffler bacillus. They had received from Dr. Von Esmarch, of Berlin, a pure culture of the Löffler bacillus, which they used for comparison in their studies. They found that in all respects the bacillus present in all their cases, was identical in its morphology; its behavior in various culture-media; and its effects when inoculated into guinea pigs, and other animals experimented upon, with that obtained from Berlin. They found invariably that cultures from the œdematous fluid found at the point of inoculation in the cases experimented with, were alone capable of reproducing the disease; and that in every instance tubes inoculated from the lymph glands, blood, spleen, liver and kidneys remained sterile; and that inoculations into animals from these sources gave negative results. They found

further that the Löffler bacilli did not invade the mucous membrane at the point of diphtheritic deposit in those affected; that they did not even pass through the thickness of the diphtheritic membranes. Roux and Yersin, as well as Brieger and Fränkel, had demonstrated that the Löffler bacilli produced, at the point affected, an extraordinarily poisonous product, which being absorbed gave rise to the severe constitutional symptoms, and to the lesions of the internal organs. Welch and Abbot say: "Our studies, so far as they have been directed to this part of the subject, are confirmatory of the results reported by Roux and Yersin, and by Brieger and Fränkel." In speaking of the local lesions in the inoculations of kittens with the Löffler bacillus, they say of Prudden's streptococci: That in the pseudo-membranes produced, as well as in the lymph in the œdema, occasioned by the local lesions, not only were the bacilli found, but also the streptococci, the faithful attendants of the bacilli. Welch and Abbot give the following summary of the result of their very careful and important observations: "By these investigations it has been determined that the Klebs-Löffler bacillus is present in all cases of primary diphtheria, in the diphtheritic deposits; that it does not invade the blood, the organs, or even the mucous membranes affected; that in susceptible animals the disease can be reproduced in all its features, even to the production of paralysis; that the constitutional symptoms, the paralysis and the changes peculiar to diphtheria in the internal organs are caused by a toxic albuminous substance or substances, which have been separated in a condition approaching purity, and which are produced by the local action of the bacilli in inoculated animals, as well as in cultures; that by various methods a greater or less degree of immunity can be artificially conferred upon susceptible animals; and that under certain conditions, susceptible animals can be cured after inoculation with virulent cultures."

Believing that what has been said as to the cause of diphtheria may in many respects be equally applicable to membranous croup, it is now proposed briefly to consider some of the literature tending to establish the similarity, if not the identity of croup and diphtheria.

Prof. Virchow, the great Berlin pathologist, some years ago announced as a pathological fact, that while the membrane in croup was similar to that in diphtheria, yet it essentially differed in this:

That in croup the membrane was deposited *on* the mucous surface, and in diphtheria it is incorporated *with* the mucous membrane; in the former case easily detached, in the latter adherent, and only detached by force. This theory has been adopted by nearly all leading text-books upon diseases of children, and is held by perhaps a majority of physicians. Virchow has since modified his views to such an extent as to claim that beneath the membrane of true diphtheria tissue-necrosis occurs; that both are morphologically true membranes—croupous when lying upon the mucous surface, and diphtheritic when followed by, or co-existent with tissue-necrosis.

Prof. Steiner, of Prague, in his exhaustive article on croup, as found in volume iv, Ziemssen's Encyclopedia, page 234, says:

> In diphtheria the lesion is similar to that of croup, only with this difference, that in croup the exudation takes place *upon* the free surface of the mucous membrane, while in diphtheria it occurs at the same time *within* the tissue, and thus produces necrosis and loss of substance of the mucous membrane.
>
> The attempt to distinguish croup and diphtheria as two entirely distinct diseases has been unsuccessful, both from an anatomical and from a clinical standpoint; indeed, there are many good reasons for supposing that these two affections are only varieties and modifications of one and the same process, which, in consequence of special influences and collateral causes, as yet imperfectly understood, makes it appearance at one time as croup, at another as diphtheria; now in a sporadic form, now as a widespread epidemic, now as a primary and now again as a secondary affection.
>
> Every one who has observed many cases of croup and diphtheria must admit that these two affections often occur together, or successively, in the same person; that the throat affection not infrequently presents the typical diphtheria at the same time that true croup is found upon the mucosa of the larynx and lower air-passages; that in the larynx itself croup and diphtheria are observed to shade into each other; and that finally constitutional symptoms, fever, glandular enlargements and albuminuria are met with during the course of croup, as well as in diphtheria.

Prof. J. Lewis Smith, who is very pronounced in his statements that these diseases are entirely distinct, says in his text-book on "Diseases of Children," under the head of pseudo-membranous laryngitis (croup): "It is said also that it sometimes occurs as an epidemic, but the supposed epidemics were no doubt diphtheritic." How does Professor Smith know this? To declare that these epidemics were diphtheria, and not croup, as alleged, is to admit, at least, such a similarity as to make it difficult to distinguish them;

while to admit that croup ever became epidemic, would tend to establish it infectiousness.

In a late article contributed to the *American Journal of the Medical Sciences* on membranous or true croup, Professor Smith says: "Since membranous croup, in localities where diphtheria prevails, is in most cases a local manifestation of this disease (diphtheria), the same sustaining general treatment is required which is proper in *ordinary* cases of diphtheria."

Brainard, in the *American Lancet*, September, 1888, says in speaking of croup and diphtheria:

> The etiology of the two affections is the same, whether we accept the bacteria theory or the theory of ptomaïnes as the cause.

Jacobbi says:

> This membrane has been called croupous when it was lying on the mucous membrane without changing much, or at all, the subjacent epithelium and could be removed without difficulty. It has been called diphtheria when it was imbedded in the mucous membrane and was difficult to remove. This difference exists, but it does not justify a difference of names, except for clinical discrimination.

Pepper, in his "System of Medicine," says that pseudo-membranous laryngitis is *contagious*.

Brainard, in his article, names the following authorities as believing in the identity of the two affections: Pepper, Bard, Bretteneau, Jacobbi, MacKenzie, Deslanders, Fuchs, Richet and Barthez, Trosseau and Bomberger, and Shaffer.

Ranke, of Munich, in the discussion of a paper on the "Specific Origin of Diphtheria," affirmed in every instance, close examination revealed a case of diphtheria in the same relation to every case of membranous croup.

It has already been shown that one of the cases examined by Welch and Abbott was croup. They say in their report of this case: "Notwithstanding repeated observations, no false membrane could be detected at any time in pharynx, or on tonsils, or soft palate. Some muco-pus was scraped from the back of the pharynx and used for cultures. Patient recovered, improvement beginning in five days after onset of symptoms. Blood serum cultures showed a few large white colonies of a coarse coccus, and a very large number of the colonies of the Löffer bacillus, the latter representing almost a pure culture. A guinea pig died after inoculation, on the third

day, with characteristic lesions. * * * In case eight, the membranous deposit was limited to the larynx and trachea; the case, therefore, being one of primary laryngo-tracheal diphtheria, *or so-called membranous croup*."

In the *Medical News* (March, 1891), Dr. W. P. Munn, of Denver, late of Alleghany, Pennsylvania, in an article on "Diphtheria, Its Cause and Treatment," says: "To my mind the 'membranous croup' of the books is a process, the pathology, clinical appearance and treatment of which are absolutely identical with those of laryngial diphtheria. The name croup is a misnomer, and its study as a separate disease has been a mistake, due to the idea that the epithelial surface remains intact in croup, although, as Bilroth states, the remainder of the pathological processes may be exactly similar." He also claims Prudden as an advocate of the identity of the two diseases.

At a meeting of the Ontario Medical Society recently held in Toronto, Canada, Dr. G. R. McDonagh presented a paper on the "Identity of Croup and Diphtheria," taking strong ground in favor of such identity. In the discussion Dr. Cronyn, of Buffalo, warmly supported Dr. McDonagh's views, and said he had "no doubt that diphtheria is a constitutional disease, and that true croup is always true diphtheria, and, therefore, always a constitutional affection."

Prof. T. Mitchell Prudden, before referred to at some length, being asked for a later expression in regard to the etiology of diphtheria and for an expression of his views for publication in regard to the identity of croup and diphtheria, replied as follows:

LABORATORY OF THE ALUMNI ASSOCIATION,
COLLEGE OF PHYSICIANS AND SURGEONS,
NEW YORK, March 16, 1891.

Dr. J. F. Kennedy:

DEAR SIR: I have just sent to the publishers a short communication on the etiology of diphtheria, supplementary to the group of cases described some time ago with a set of cases wholly uncomplicated with scarlatina, measles, erysipelas, etc., in which I find the Löffler bacillus, together with the streptococcus. I have no doubt that we ought to separate the pseudo-membranous inflammations into at least two classes. The first, *primary diphtheria*, is caused by the bacillus of Löffler, and that ought to be regarded as the prime diagnostic element. The second class is, I think, usually, if not always, caused by streptococcus, and is very apt to occur in connection with scarlatina, measles, and erysipelas or phlegmon. The distinction between these classes is not along the old line between croup and diphtheria, but is

Croup and Diphtheria.

largely dependent upon the etiological factor. Both are, I think, infectious diseases, though the true primary diphtheria, caused by the Löffler bacillus, is perhaps the most readily communicated under ordinary circumstances. It is not at all improbable that the current bacterial methods may come into use by the practitioner for making the diagnosis between the two forms of pseudo-membranous inflammation. I certainly think that both should be isolated, and that, in fact, both in proplylaxis and treatment, the same care in isolation and disinfection should be used as has recommended itself in the management of true primary diphtheria.

I think this covers the questions which you asked, and I much regret that I am so very busy that I cannot put the matter in a smoother form. Drs. Welch and Abbott have published in the last number of the *Johns Hopkins Hospital Bulletin* the results of their recent studies, and a most admirable summary of late work. Yours very sincerely,

T. MITCHELL PRUDDEN.

The practical conclusions in view of all this strong testimony in favor of at least the similarity of croup and diphtheria are, that both are infectious diseases, and subject to the same repressive measures. That the disease is caused by a specific bacillus, and that therefore the only reasonable methods of prevention are isolation and disinfection. Prudden, and other observers, have demonstrated that the dried sputum is one of the most fruitful sources of contagion; and Klein, that it may be conveyed by cats and milk. The evidence is so strong, if not convincing, that croup is but another manifestation of diphtheria, that the Iowa State Board of Health, for sanitary purposes, if not scientifically, practically declares them identical by subjecting them both to isolation under the name of diphtheria.

The Indiana State Board of Health treats them as identical.

Massachusetts says in its circular for "Preventing the Spread of Diphtheria:"

Whether or not diphtheria is another form of the disease which is usually called membranous croup, it is certain that the two cannot always be distinguished at the bedside or in the autopsy room; and that what had been supposed to be the milder disease has been the means of communicating the most virulent diphtheria. All cases of diphtheria and croup should therefore be treated by the health officer with similar precautions.

Dr. C. N. Hewitt, the secretary of the Minnesota State Board of Health, and late president of the American Public Health Association, says in a note dated March 26, 1891:

We always treat croup as diphtheria, until proved not to be diphtheria—the only safe way for health officers.

Croup and Diphtheria.

All should bear in mind the fact that there is more danger from *exposure* to the disease than from any other cause. It has been the fashion, and is yet to too great an extent, to lay the blame upon contaminated water, or on unsanitary surroundings.

Dr. Thursfield, of England, in a work just issued upon the "Etiology of Diphtheria," after an official investigation of nearly two thousand cases occurring in seven different countries of England, says: "Structural dampness of habitation is the condition most favorable to the incidence, the severity, and the spread of the disease. That the germ can exist and remain potentially active outside of the human body I have no doubt, but that it has any connection with the gross forms of mould and fungi, other than coincidence, I do not think for an instant. I have not been able to establish any connection between diphtheria and contaminated water."

His testimony is of vital importance and should command great respect. If it teaches any lesson it is that dampness and unsanitary conditions favor the inception of the disease, but do not produce it. In every place, under every condition, it requires the presence of the disease germ to produce a single case.

If the various boards of health, and the physicians of the State, will treat every case of membranous croup as diphtheria, and isolate and disinfect both as prescribed by the rules of the State Board of Health, the time will soon come when this scourge—this unnecessary scourge of our fair State—will be as rarely seen and as little dreaded as small pox.

THE CONTAGION OF DIPHTHERIA.

At a meeting of the Association of American Physicians held at Washington, D. C., in September, 1889, Dr. P. G. Robinson, of St. Louis, read a paper which represents the present status of the medical profession and of sanitarians. The following epitome of the paper is taken from "*The Journal of the Medical Association:*"

"Diphtheria is an acute infectious disease, doubtless due to a living organism (microbe), the exact identity of which cannot yet be regarded as settled. Primarily a local affection, the system becomes secondarily and generally infected through absortion of a poison generated at the primary and localized seat of inoculation.

"The modes of infection are numerous, the contagium being

directly transferred by contact, in a dry state through the air for a limited distance, in foul clothing, in polluted food and drink, milk probably being a prolific source of infection.

"The most difficult problem to solve is that which relates to the conditions most favorable to the growth and development of the germ and propagation of the disease. While, strictly speaking, diphtheria can hardly be called a filth disease, since it prevails often to a very limited extent in those localities whose hygienic surroundings are apparently the worst, yet certain kinds of filthy accumulations, as the ordure of animals, notably the refuse from cow sheds and dairies, seem to furnish the most favorable conditions for the culture of this particular germ.

"Until this problem can be solved, and the life history and habitat of the diphtheritic germ is understood, no definite plan can be formulated for the arrest of the contagion, nor for the hopeful treatment of the disease."

HOW DIPHTHERIA IS SPREAD.

Investigation has shown that the spread of diphtheria in a community is due almost entirely to the neglect of duty of local boards, who in many instances seem to have no conception of the nature of the disease, nor of their duty. It seems to be the general impression among local boards that their duty is ended when premises are placarded with the danger signal, whereas they have but just commenced.

A prolific source of spread of the disease is neglect or refusal of the attending physician to report to the local board, so that however efficient may be the board, the disease has become extended before the board has any knowledge thereof.

The most effectual remedy for this is, as is done in several other States, to require physicians to report by statutory regulation. For ten years, as a suggestion or recommendation from the State Board, it has been practically ignored by local boards.

Dr. R. J. Hart, health officer for Charter Oak, Crawford county, reports the death of his two children from this disease. They contracted the disease while on the cars in transit from Los Angeles. His wife, who occupied the berth with the children, also had it. There is good reason to believe that contagious diseases are frequently communicated from tourist cars; that proper care is not exercised in renovating and changing bed clothing.

Dr. Sigworth, health officer at Anamosa, reports an instance of diphtheria occurring in two students attending school at Toledo. They at once came home, and their clothes were sent to a washer woman. Soon after there were seven cases of diphtheria in the house, with three deaths. Subsequently there were five other cases and two deaths in the neighborhood, when the local board established quarantine and took the necessary measures to stamp out the disease. The first case was a little child, and the woman who washed the clothes of the two students, says the child played about the wash-tub while she was washing.

The son of Mr. A, a farmer near Des Moines, was sick. A physician was called, who examined the case and said it "was as near diphtheria as could be and not be called by that name." There was a little girl in the family, the only other child. In a few days after the son was sick, the little girl was taken sick in the same way, "as near diphtheria as could be." Both cases were mild and both recovered. The physician did not notify the local health board, nor did he caution the family as to the dangers of exposing others, hence no quarantine nor disinfection was practiced. The little girl was not sick over a week, and immediately after she was able to be about, the father and mother and the little girl went to visit in another township. The parents, during the three or four days' stay, visited several families, but the little girl remained with Mr. B's family and played with the children. Three days after Mr. B's oldest child was taken with diphtheria, another child was seized a day or two later, and a third one soon after. The second one seized died, and the last one, at last account, "was not expected to live." The gentleman sending these facts is not a rival physician, but an intelligent farmer, a township trustee. He lays the responsibility of the sickness and death at the door of the physician in attendance, and says further, "I do not think Mr. A would have failed to use proper precautions, had such been required."

In writing to the physician, who had charge of the first case referred to, and calling attention to the sad consequences of this visit, he says that at the time of his visit the young man had no symptoms of diphtheria, there was no fetor of the breath, and no diphtheritic patches upon the throat, but he had some fever, chilliness and pain in the back. He says "this (these symptoms) led

me to suspect, as I told them, that he might have had a mild attack of diphtheria." * * * "I know nothing about the other case you mention in the same family," the little girl. He says further, "my experience, which has been considerable, convinces me that nine-tenths of even well-disposed, intelligent people utterly disregard precautionary measures, even when recommended by the board of health, as soon as the patient seems to be quite well. I do not say this to justify my course in the above case, which I regret more than I can express, and will profit by this lamentable experience."

A case is reported of a boy four years old, who had a mild attack of diphtheria, and became convalescent in five days. He was then allowed to go with other children. A little girl three years old, took a piece of gum the boy had been chewing, and transferred it direct from the boy's mouth to her own. The following day she was taken with malignant diphtheria and died.

The practice of chewing gum has become very wide-spread. It is not a very elegant habit; to many it is positively repulsive; and there are sources of danger, too, that should not be overlooked. Diphtheria broke out in a family in Des Moines. After the child had recovered, the clothing and all the exposed articles fully disinfected, the parents, with the convalescent child, visited some relatives in the country. The indispensable chewing gum, like Satan, went also—in the mouth of the little child. Prompted by generosity it allowed its country cousins—two children—to chew also the gum previously chewed by the visiting child. In three or four days without any other known source of infection than the chewing gum, the two children were simultaneously stricken down with diphtheria in a most serious form. It would be hard to imagine a more successful mode of propagating—distributing the disease. It would be a great deal safer not to chew the stuff at all, but if it must be done to satisfy the demands of a weak head, and a depraved appetite, don't "swap" gum—don't chew anybody else's gum, nor allow anybody else to chew yours.

A physician of Kansas writes that he was called to attend a little three-year-old girl suffering with diphtheria. Upon careful inquiry it was found that she had not been exposed to the disease, although there were some cases within a mile of her father's house. He incidentally learned that there was a sick cat in the house, which had been fondled by the little girl some days before. The cat died shortly after its playmate became sick, and a second cat also became sick and was killed. Suspicions were aroused that the disease was conveyed by the cat, and inquiry revealed the fact that one farmer had lost seventeen cats, and another fifteen, with some throat trouble. One of the farmers stated that he had examined the throats of some of the cats, and found them covered with a white membrane. The little girl died, and her little brother a few days later had a severe attack of the same disease. Cats are disposed to run from house to house at night, and one diseased cat may be the means of carrying disease to half the cats in the neighborhood, they in turn carrying it to children whom the parents are taking every means to protect from danger.

Two instances have been reported where the disease could be traced to no other source than to cats. The family was so situated that infection was impossible by exposure from other persons. A distant shipment the cat and the family cat were sick about the premises with symptoms of diphtheria, and finally died. Soon after, the last two more the disease. In another case, three dead cats were the floor. The premises were isolated. It was remembered with reference to the disappearance of the cats they were sick several were removed, and the disease subsided. The sanitary surroundings and water supply of the premises were unusually good, thus fixing the cats as undoubtedly the source of the disease.

The cat will be found a source of this disease to a much greater extent than has been hitherto supposed.

The record of investigations shows that not only cats, but chickens, are peculiarly susceptible to this disease.

These facts are given the public to afford another link in the history of diphtheria, and to improve the opportunity to insist upon physicians giving the people the benefit of any doubt there may be. *If it is a questionable, a doubtful case at all, it is a case for quarantine.* A few days would determine the exact nature of the case. If it was not an infectious disease, the quarantine could be removed. If it proved to be one endangering the public health, a great favor would be done to the community by the isolation.

What is earnestly insisted upon is to throw aside such words as "croupous diphtheria," "diphtheritic croup," "membranous croup,"

"follicular tonsilitis" and "ulcerative sore throat," and call diphtheria "diphtheria," and use the appropriate preventive measures. Then, and not till then, can the terrible ravages of this disease be stayed.

Don't look into the water and the soil; don't fear sewer-gas and privy vaults, so much as the person, and the exhalations of one who has, or has recently had the disease. There are countries where a case of diphtheria has never been seen, where the population is dense, and where air, and water, and soil are [illegible] with pollution. There never will be a case there unless the disease germs are transported and implanted there by some infected person or thing.

In a letter received from an American physician in charge of a hospital at Wuhu, China, a few days since, he says he has never seen in that district a single case of diphtheria, nor could he learn of a case ever having been there, and Wuhu is a large city, densely crowded, and with an utter disregard to all sanitary precautions. Let diphtheria once be transplanted and it would reap a generous harvest.

In another part of this report will be found the regulations of the State Board regarding the shipment of bodies dead from diphtheria, and the use of the term "heart failure" as cause of death. This is the fashionable and delusive, not to say dangerous, term used in many cases of death from diphtheria. As an illustration of the danger arising from such a misleading term, attention is called to the following from a communication from the Secretary of the State Board of Health of Ohio:

A child thirteen years of age died from diphtheria at Ravenswood, Ill., on December 6, 1889. On the 8th the corpse was taken to Zanesville, Ohio, accompanied by the parents and their four children. The coffin was opened and viewed by the family of the dead child on December 8th. On the 13th these four children and their mother were stricken with the disease, and four days later three of the children of the family in which they visited, and one other child, contracted the disease. Nine cases from one center of infection—four of them resulting fatally.

Dr. J. H. Rauch, the eminent Secretary of the Illinois State Board of Health, to whom the above communication was sent, in his report to the Board at its late session, says:

The history of this case is another illustration of the contagiousness of the disease of diphtheria, the necessity for strictly private funerals and the danger of transporting the bodies to distant places for interment of those who die from contagious and infectious diseases. In this connection I would suggest to the Board that instructions be issued to local health authorities not to accept certificates where the cause of death is said to be heart-failure." This term has recently become fashionable, but for sanitary purposes amounts to nothing, as nearly all die from that cause.

As a sequel to the above, and as illustrating more fully the dangers to the public from those dead of contagious diseases, the following is taken from the Chicago *Herald* relating to the same body. Here we find nearly thirty *fatal* cases of diphtheria, all traceable to the shipment of a corpse from Chicago:

DOZENS OF PEOPLE CARRIED OFF BY DIPHTHERIA TRACEABLE TO A CHICAGO CORPSE.

COLUMBUS, Ohio, March 7.—John C. McGregor, reading clerk of the Ohio house of representatives, died to-day of diphtheria, his wife and four children beside himself all having fallen victims to the same disease in the last three weeks. These cases of diphtheria were a few of many caused at Zanesville, by the shipment there of the corpse of a little girl, who died of the disease in Chicago, with a physician's certificate that death had resulted from some non-contagious disease. Nearly thirty fatal cases of the disease at Lancaster in the last two months are directly traceable to this source of contagion, and one family of nine persons wiped out of existence, grandfather, grandmother, father, mother and five children.

Instances are reported where ministers in this State went into homes where death had occurred through diphtheria, and carried the contagion into their own homes, and as a result were called upon to bury their own loved ones.

What the people need to learn is that diphtheria is terribly contagious and fatal, and that public funerals are a fruitful source of spreading the disease. Neither religion nor humanity, nor any sympathetic sentimentality, should permit, much less call for such wanton exposure to disease and death.

INFLUENZA—OR LA GRIPPE.

Since the last biennial report not only Iowa, but the entire world so far as heard from, has had visitations of a peculiar affection called commonly "influenza" or "la-grippe." It began in the early Winter of 1889, in St. Petersburg, Russia, and spread rapidly toward the southwest, until in a few weeks, not only Europe, but America, was overspread with it. The symptoms were so uniform, and the number attacked in each neighborhood so great, that the people everywhere soon formed a painful and dangerous acquaintance with it.

At first it was generally regarded as being carried by meteorological or atmospheric conditions undetermined and variable. So many were attacked so nearly simultaneously, that the idea of contagion, with an incubative period, was generally discarded. The earlier symptoms, though painful, and often very serious, generally lasted but one or two days, when apparent convalescence began. At this stage exposure or exertion was sure in a large number of cases to bring sequelæ that were very serious, and much more frequently fatal than the original disease.

While the proportion of deaths to the entire number attacked was small, yet owing to the very large number afflicted, the mortality in the State and in the country was fearful. It is doubtful if any disease in the State, unless it be consumption, reaped such a bountiful harvest of deaths in Iowa, as la grippe. A very large proportion of those who did not die, have never recovered their former health, and are to-day but physical wrecks. It attacked most frequently the infirm and the aged — especially those who were mingling with the masses of the people. Children were not especially susceptible to it, and very few of this class died with it.

After leaving the country, and apparently disappearing entirely for several months, it reappeared in the late Fall of 1890, and again spread all over the American continent. There were not so

many attacked, but it remained until late in the Spring of 1891, and was at places very malignant. It was reported that in one week, in March, in Chicago, there were one thousand and four deaths from this disease. It was unusually severe in Dubuque, and the mortality in Des Moines was quite considerable.

A great deal of patient, persevering investigation has been given to study of the cause and character of this strange affection. At first people were disposed to make light of it, and treat it as a kind of joke. It is, however, one of the most unfortunate calamities that has ever visited our country.

As a result of the investigations that have been made, and are still in progress, with a fair prospect of speedy solution of the mystery, as to its cause, it is now pretty generally admitted to be a highly contagious disease—spreading by personal contact, and by an infection. If this opinion stands the tests of further observation, and admits of demonstration, then are we better prepared to avoid it. The incubation is exceeding brief, and is not definitely determined. It has been noticed in this State that an unusually large number of physicians who were visiting these cases succumbed themselves to the disease—more physicians, proportionately, than those of any other occupation. There are now in Iowa more physicians broken down in health, and prematurely aged and disabled, as a result of "influenza" than from most other causes combined. It is confidently hoped that before another attack sweeps the country the people may be better acquainted with it, and better prepared to escape it. There is perhaps no other question relating to Preventive Medicine of more importance than the cause and best methods of preventing this wide-spread scourge.

SCARLET FEVER.

Scarlet fever, though not generally prevalent throughout the State, has appeared in a number of localities, and in some places assumed almost epidemic proportions. This condition is not only to be deeply deplored, but highly culpable. The people generally are well satisfied that it is a highly contagious disease, and when called "scarlet fever" the popular sentiment in all parts of the State is strongly in favor of isolation and disinfection. The attention of this office was called to a number of instances where through ignorance of the attending physician, or because of a desire to accommodate the family affected, the disease was denominated "scarlet rash" or, perhaps, "scarlatina," with the understanding that it was simply not contagious, and no isolation nor disinfection was needed. Exposures were frequent, and in two or three weeks other cases occurred more severe, some of which were fatal. So long as death does not occur, or kidney or some other serious complications do not supervene, no repressive measures are resorted to.

The disease has been well nigh stamped out of the State, and an early recognition of its character, and prompt isolation of each case would soon place it beyond our boundaries.

Physicians should know, (and intelligent and educated ones do), that scarlet fever, scarlet rash and scarlatina are but different terms for one and the same disease—equally contagious, and equally liable to serious complications, and to produce fatal, as well as mild cases.

Next to isolation, disinfection is the most important preventive means. Indeed, so important is the latter, because of the persistent vitality of the germs producing the disease, that isolation without the latter is of but little avail.

The most effective means of practicing disinfection in this disease is by inunction—rubbing the entire body with some disinfecting ointment twice or thrice daily. This inunction not only is

a great help to the patient, as a therapeutic agent, but disinfects the scales always thrown off in this disease, and thus renders them harmless. Corrosive sublimate and biniodide of mercury, though very efficient disinfectants, are too poisonous for use in such cases, and many others have proved not only ineffective, as disinfectants, but greatly annoying the patient. Perhaps the most efficient, harmless and grateful application is that used by many in England, and highly commended by Dr. J. Brindon Cargenven, M. R. C. S.

It is an entirely *volatile* disinfectant, consisting of thymal and some essential oils dissolved in the oil of *eucalyptus globulus*. Dr. Cargenven says:

> It is not poisonous, as carbolic acid and the mercury salts. It does not interfere with the action of the skin as fats and fixed oil. Its inunction produces a slight stimulating effect on the skin, and there is a sense of general warmth. The rash appears brighter, but fades away rapidly in ordinary cases within twenty-four hours. The temperature falls rapidly after the commencement of the treatment, and reaches normal, or below ninety-nine degrees from the third to the sixth day in uncomplicated cases. The pulse, under treatment by inunction, falls below one hundred on the third and fourth days, and reaches normal about the sixth or eighth days. Desquamation commences soon after the rash disappears, and occurs only on those portions of the skin occupied by the rash, and it ends from the tenth to the fifteenth day. The falling cuticle does not convey any infection. The patients can safely mix with others after the tenth day. No isolation, as now understood, is necessary, as other children can frequent the room of the patient without taking the disease. Albuminuria is absent, or it appears only in a slight degree, in all the patients treated by inunction, from not later than the second day. The disinfection of the bedding and the room is accomplished *pari passu* with the treatment of the patient, the volatile oils and their vapor penetrates all clothing and pervades every part of the room."

We commend a trial of this preparation by our local health officers and the physicians of our State, believing that it will be found satisfactory. This combination has not been much used in this country, so far as is known at this office, but the eucalyptus is popular, and is becoming quite generally used in infectious diseases, especially in diphtheria.

TYPHOID FEVER.

The cases of typhoid fever are growing fewer each year. It is generally recognized as a "filth" disease, and yet strictly there are few, if any, purely filth diseases. Typhoid fever is always and only produced by a micro-organism—the *typhoid bacillus*. This organism finds its most favorable conditions for existence and indefinite multiplication in filth, heat and moisture. Hence, where this disease germ, unless sterilized—that is, rendered incapable of multiplication, finds its way into water, or night soil, it increases with wonderful rapidity, and through polluted water or food, finds its way into the stomach and intestines, there to do its deadly work. The preventive measures recommended are *the preservation of the soil and water in as pure and healthy condition as possible, and the* THOROUGH DISINFECTION OF ALL THE DISCHARGES FROM TYPHOID FEVER PATIENTS. Typhoid fever could be effectually and completely annihilated in a few years in this way.

Practicing physicians, health officers and local boards are charged with the sacred duty of guarding the public from this terrible disease. The people at large, especially those having the disease in their families, are the most efficient and essential co-operators in this work. It is hoped that the cheerful and combined efforts of all will say to this disease—"No further!"

SMALL POX.

This disease may be said to have virtually disappeared from the State. Though one of the most contagious, as well as loathsome and dangerous diseases known, it attracts but little—it is feared too little—attention. The health forces of the State, and the rules and regulations, as well as practices of the State Board, ably seconded

by the local health boards, render it almost impossible for the disease to gain a foothold in the State. The only cases that ever occur are imported, or are occasioned by the importation of infected clothing. So soon as a case appears, and is recognized, prompt isolation is secured, and everybody in any way known to have been exposed is vaccinated. As a result the disease never gets beyond the family where the first patient is taken care of, and seldom beyond the party originally attacked.

This happy condition of immunity results solely from the protective power of vaccination, and from a prompt and cheerful compliance with the rules and regulations of the Board, as applied by the local boards.

Inasmuch as tuberculosis and actinomycosis are common diseases of cattle, and the human family as well, there is prejudice, perhaps justifiable, with many, against the use of vaccine lymph—whether human or bovine. It is probable that the dangers are very much magnified, and it is highly questionable whether the diseases named, or even syphilis, have been, or can be, communicated through vaccine lymph. Still, the prejudice exists. It may be some comfort to such to know that successful efforts are being made to procure lymph from the goat, an animal remarkably free from disease. Should further investigations confirm the favorable conclusions already reached, and the virus from this source be found sufficiently abundant, as well as unquestionably reliable, it will be a great boon to mankind.

The following article by Dr. Daniel F. Wright gives the results of some investigations and observations relative to the possible dangers of bovine and humanized virus, and suggests the possible, if not probable, superior value of that obtained from goats:

GOAT OR COW—CAPRINATION OR VACCINATION.

A question is arising within the profession which is likely to assume considerable importance, and I propose to state in this paper some of the points which have been advanced in relation to it.

The question is, to state it briefly, whether, in the method of prophylaxis against small-pox, known as vaccination, the goat may not be advantageously substituted for the cow; in this case of course *vaccination* would be a misnomer and we should have to call it *caprination*.

The considerations bearing upon this question have been for some time accumulating, and have all transpired during the professional life of the present writer.

The first of these was that tuberculosis is a contagious disease.

Small Pox.

Next it was shown that, like some other diseases, it was intercommunicable between man and the cow.

The third discovery, now quite recently made, was that it could not be communicated to the goat while the virus of variola was so communicable, and was, when it had passed through the system of that animal, capable of infecting the human constitution, producing the same effect of prophylaxis as that derived from vaccination.

Of the first principle I need say nothing, as it has now been established to the satisfaction of all intelligent physicians, especially since the discovery of the *bacillus tuberculosis* and its introduction into other organisms. I shall assume, therefore, that tubercle is communicable to human and other constitutions through the medium of that micro-organism.

On the second proposition I have myself collected some facts and published them in a paper formerly printed in the *Bulletin* in reference to the much needed inspection of meats. Since then the conveyance of the infection to children and others through the milk of a tuberculous mother, or that of tuberculous cows, has been elaborately investigated, and foremost in this search has been Dr. Harold C. Ernst, of Massachusetts, who was three years ago employed by the Society for Promoting Agriculture for the purpose. Abundant means for persecuting his researches were furnished him, both in the way of animals and a complete laboratory by the society.

In these studies he was ably assisted by Dr. A. K. Stone, who conducted the microscopic examinations.

A special subject for enquiry was the power of milk from tuberculous animals to convey the specific infection to those who drink it. This was completely established.

1. By the demonstration of the bacillus in the milk.

2. By furnishing the milk of tuberculous cows to healthy calves, to pigs and other animals with the result of establishing tubercular disease in the recipients.

3. By the hypodermic injection of milk from tuberculous animals in rabbits and guinea pigs with the same result.

An important statement is made by the examiner here that animals were excluded in which tuberculous disease existed in the udder, with a view to making the experiment crucial as to infection being carried by the milk itself, and, therefore, pre-existing in the blood of the animal. It was also stated that while in many cases the *tubercle bacillus* was detected in the milk of tuberculous cows, yet, in some cases, its existence there could not be ocularly demonstrated, and yet was proved to be there by the inoculation of healthy animals. This will not surprise anyone who knows the difficulty with which the presence of a small number of such minute organisms can be detected in a large quantity of the fluid examined.

The above facts are derived from Dr. Ernst's report upon the subject made before the Committee on Public Health of the Massachusetts' Legislature. They prove not only that the milk produced infection, but that it was produced from no local cause, but from the milk itself, and must, therefore, have pre-existed in the blood.

Small Pox.

If so, it seems clear that vaccine matter from tuberculous cows is a dangerous medium for vaccination, which is the first point I desire to establish.

My next point is that where goats instead of cows are made the medium for developing the variolous lymph, the same danger does not exist. To carry out this point we give the results of some experiments made in France by Messrs Bertin and Picq. They come to us through the excellent *Monthly Sanitary Record*, published by the Ohio State Board of Health.

It having been doubted by M. Germain Sec whether there was danger of tubercular infection from vaccination, M. Toussaint, of Toulouse, made some experiments which proved "the possibility of the transmission of tuberculosis by vaccine taken from a tuberculosis heifer," but stated that "goats, on the contrary, are absolutely refractory to tuberculosis."

This statement occasioned the experiments of Bertin and Picq, who formulated the following results:

"1. Humanized and bovine virus produce in the goats phenomena which coincide exactly in their march with those in man.

"2. Vaccination from goat to goat pursues an evolution similar to that from heifer to heifer.

"3. Goats are insusceptible to tuberculous inoculation. They incidentally inform us that goats are also exempt from inoculation by syphilis."

These carefully conducted researches by highly scientific men, urge considerations on the profession which we can in no way afford to neglect. Admitting that tuberculous infection through the vaccine lymph may be quite a rare occurrence, we know now that it *can* take place, and have no means of knowing how often it *has* resulted. Have we a right, therefore, to use the vaccine lymph without knowing the condition of the animal from which it has been derived? No doubt the owners of vaccine farms are careful in procuring healthy animals, but where the tubercle has not infected the udder or other local parts its detection is by no means easy. Pressure, therefore, ought, I think, to be brought to bear on the owners of such establishments to bring about the substitution of goats for cows, and this duty seems to me to be specially incumbent on those whose special duty it is to influence public opinion on sanitary matters, such as the public sanitary organizations of the several States. On this organization I respectfully urge this question.

MM. Bertin and Picq are continuing their experiments on the cow and the goat, to ascertain if tuberculosis can be transmitted either by virus or vaccine.

Leprosy.

LEPROSY.

Since the Third Biennial report in 1885, two cases of leprosy have been discovered in this State, a report of which has been withheld until their final determination was reached.

The first case was reported by Dr. J. I. Bailey, health officer at West Liberty, in March, 1888. Dr. Shrader, of the State Board, gives the following report of his visit to the affected person, accompanied by Dr. E. H. King:

"In Springdale township, Cedar county, Theoline Roseland, aged twenty-four, single, a native of Stavanger, Norway, a blonde, fairly well nourished, who had at that time been in the United States five months, one month traveling about, three months at Montour, east of Marshalltown, Iowa, and one month at West Liberty. According to her statement, about ten years ago a spot, somewhat reddish in character, made its appearance on the outside of small toe of right foot, which continued to spread slowly until it involved the leg to the knee, and has extended up the thigh to the junction of the upper and middle third; it is of the tubercular variety—the limb is very much swollen. There are some portions of the foot, leg and thigh that are not covered by the tubercular growths, and in those places not affected, the skin has nearly a normal appearance. Some small spiculæ of bone have been exfolioted from the bones of the foot. Finding she had a brother in Chicago, I directed her to be sent there, and a letter be sent to the proper authorities informing them of the facts. Since then I am informed that her brother has refused to receive her, and she is still in West Liberty, Iowa."

The latter part of March she removed to Marshall county, near Le Grand, and August 8th, Dr. J. I. Bailey, of West Branch, reported that she was doing ordinary house work, much improved in health, and the tubercles disappearing under the influence of good hygienic surroundings, out of door exercise, rest of mind, and soothing applications to the affected limb.

Leprosy.

In June, 1888, another case was reported, near LeGrand, Marshall county, by Dr. C. Reiterman, Health Officer, to-wit:

"Helena Halverson, *nee* Peterson, wife of Andrew Halverson, Octo-29, born at Korpe, near Stavanger, Norway. Parents living and well. Four brothers and two sisters living and well. One sister died in childhood, cause of death not known. Grand parents said to be healthy and long-lived. No history whatever of the disease in the family for several generations back, and no history of exposure to contagion. Came to Iowa from Norway in June, 1886; married in April, 1886; has never borne children. First complained of illness September 1, 1886. A Norwegian lady, however, says she elicited from the patient herself, by adroit questioning, a confession that her health was *not* good for *two or three years* before leaving Norway. She has complained bitterly of pains of an erratic character in chest, shoulders and arms, and has been very nervous or "hysterical" much of the time for a year past. Her face wore an anxious look, and she assured her friends that she would die. Bowels constipated, pulse and temperature usually about normal. Nature of case very obscure until about June, ——, when an ulcer about the size and shape of a silver quarter was noticed at an inferior angle of the scapula, clearly circumscribed, deep, with bright red margin, and dry whitish crust on its floor. A small red, tawny spot, a little lower on the right side, was discovered at that time. A week or two later the ulcer was larger, and covered by a dry, brown crust. Seen Monday, June 9th, with Dr. Clark, of Grinnell. Appearance at that time as follows: Ulcer at angle of left scapula two and one-half inches or more in vertical, and one and one-half inches in transverse diameter. Floor covered with brown slough, margin red, not sensitive or painful. Discharge, which had been quite scanty before, was now considerable. A couple of inches below right scapula was noticed a spot one inch in diameter, rough, scaly, whitish and anæsthetic. Over the left sterno-mastoid muscle, about two inches below the ear, is a small, red, shiny spot, about the size of a split pea, hard and smooth. Said to have a sore of some kind upon buttock, which we could not examine. Pulse, 110; temperature, 100° Fahrenheit. Sensitive to touch or motion. Emaciated, sits propped up in bed all the time. Disagreeable, 'musty' odor is plainly noticeable upon entering the room."

Leprosy.

August 1st Dr. Reiterman sent the following supplementary report of the case:

"The further history of the case of leprosy reported July 10th, is briefly told. Diarrhœa supervened a few days after, and persisted about ten days. Strength and appetite failed steadily, while pain and wakefulness increased. The local manifestations progressed quite rapidly, but were not very carefully observed of late. The odor became *extremely offensive*, and what might be characterized as 'suffocating.' Death closed the scene at 12:30 P. M., August 1st."

Upon the receipt of this report with a view of ascertaining to what extent the disease existed in Norway; what steps were taken to prevent those afflicted with leprosy from emigrating; and so far as possible to inaugurate measures that would in the future prevent their importation to Iowa, the following letter was written:

OFFICE OF THE IOWA STATE BOARD OF HEALTH,
DES MOINES, IOWA, July 14, 1888.

Gerhard Gade, United States Consul, Christiana, Norway: During the last two months two cases of leprosy have been discovered in this State, both subjects being recently women from Stavanger, Norway—one Theoline Roseland, aged twenty-four; the other married, Helena Halverson, *nee* Peterson. You may readily understand that our people are quite alarmed over this importation of this dread disease into our State, and the rapid recurrence of the cases tends strongly to the conviction that there is a method in the matter. The local authorities must know that these persons are from leprous families. They have no right in comity or justice, to allow them to come here to burden the people with expense, and spread the disease, and our State authorities will take the necessary steps to prohibit their importation into this State, and will send them out of the State if they come. In behalf of the State Board of Health, I desire you to make inquiry regarding this matter, ascertain what regulations are in force there regarding leper families, and take such steps as you can to protect us from this criminal and outrageous importation. Stavanger seems to be a specially infected district. The persistent effort to secret this disease in these two cases is positive evidence of knowledge of it previous to coming here. Please inform this office of the result of your investigations. Yours very truly.

J. F. KENNEDY,
Secretary.

The following is the reply:

CONSULATE OF THE UNITED STATES OF AMERICA, CHRISTIANA, NORWAY, Aug. 15, 1888.—*Mr. J. F. Kennedy, M. D., Secretary Iowa State Board of Health, Des Moines, Iowa, United States of America,*—DEAR SIR: I am in receipt of your favor of July 14, relating to the importation into your State

Leprosy.

of two cases of leprosy from Norway, and understand your indignation at such introduction of a most dangerous disease.

In my consular district, which only embraces the southern and eastern Norway, hardly any cases of leprosy are to be found, while about one thousand three hundred persons, who at the present moment are known to be affected with leprosy in this country, are scattered all over the western and northern districts. It is a fact, fully established by the annual statistics, published by the Government's Board of Health, that the number of lepers is constantly and rapidly decreasing. While in 1860 the lepers who lived outside the asylums numbered two thousand two hundred and twenty three, only six hundred thirty-three were to be found at the end of 1885. In the latter year fifteen new cases had been discovered, sixty-three had died, sixty-five had been removed to the asylum, fifteen had left their former districts (in some cases perhaps also the country), and seven were cured. At the end of 1885, five hundred and twenty-four, two hundred and fifty-five of whom were men, two hundred and sixty-nine women, remained at the five asylums established for the treatment of lepers; seventy had died during the course of the year. On the whole it is believed that leprosy will gradually disappear from the country, or at least be confined to some few districts on the coast, where the people are poor, and occupied with fishing in a hard climate.

Relating to the two cases of leprosy recently imported from the district of Stavanger into your State, I venture to say that the local authorities of the district were entirely ignorant of their going to America, and that at least no purpose of getting rid of the unhappy sufferers did exist here. Everybody is allowed, without any restriction, to emigrate from Norway, and the two women in question, who probably have relations in Iowa, had only to go to Stavanger and Bergen, and buy their tickets for passage without communicating beforehand with any of the local authorities. A very superficial medical examination of emigrants is ordered at the shipping ports, but the examiners would hardly have any time for discovering those affected by leprosy without being previously informed of their disease, and of their intention to conceal it.

It certainly would be of great interest to know the parish whence the two women hailed. It might then be ascertained through the pastor of the locality, who would know themselves, and their family whether leprosy existed in the family, and whether it was known that they had gone to America. It might then be ascertained from what source they got their passage money, and whether they had ever been assessed by the Poor Board, or otherwise. The district of Stavanger is not a specially infected district as you seem to believe. At the end of 1885 it had only fifty-six lepers living out of the asylums, while the district of Bergenhuns had at that time one hundred and fifty-six. I am bound to repeat that in my opinion, no authorities of that district would have thought of throwing off the leprous women to let America take future charge of them. The regulations now in force in Norway regarding the lepers, are contained in the laws of June 6, 1885, on separation of lepers, and treatment of them in public asylums or hospitals. The

Leprosy.

law prescribes that lepers shall not be lodged with private people at public expense, but in case of needing public assistance, they shall, by the Poor Boards, be admitted to the public asylums. If destitute lepers are not treated in such asylums, they shall either be kept in separate dwelling rooms, or be treated in such way as the Boards of Health may deem sufficiently safe. The law prescribes also that other lepers (beside the destitute ones) may also be ordered by the Board of Health to live separate from their family and friends, and if such order should be disobeyed they shall also be treated at the public asylums. Rooms, clothing, bedding and other effects which have been used by lepers must not be in use by, or be handed over to, other persons without being previously disinfected by order of the respective Boards of Health. The proper way to prevent lepers from emigrating to America in the future would, in my opinion, be to bring the subject before the American Government, which then probably would insist with the Government of Norway, that a strict and scrupulous medical examination be made of all emigrants from the western districts of Norway. It is not in my power, as consul at Christiana, where no leprosy exists, to take any steps against that emigration, of which you justly complain. I will add to my foregoing observations, that more than ten years ago leprosy was introduced into the northwestern States of the United States, through emigrants from Norway, and that Prof. Boeck, the celebrated dermatologist, had himself made careful inquiries in America about the Norwegian people there, who had brought the disease with them from the old country. Also, Dr. Armaner Hansen, a well-known specialist in the treatment of leprosy, went to America to visit these lepers of Norwegian origin. I have tried to give this important subject my best attention, and will be glad to learn that through diplomatic intervention, some effective means may be found to stop further introduction of the disease into the United States. If I can do anything to attain this end, I will consider myself very happy.

Very respectfully, GERHARD GADE,
U. S. Consul.

Accompanying the foregoing letter, was a copy of a printed circular of regulations in force at Christiana.

The foregoing correspondence was referred to Senator W. B. Allison, member of Congress from this State, to-wit:

STATE BOARD OF HEALTH,
OFFICE OF THE SECRETARY, Sept. 1, 1888.

HON. W. B. ALLISON, M. C.—*Dear Sir:* I desire to call your attention to the enclosed letter from Gerhard Gade, U. S. Consul at Christiana, Norway, replying to a communication from this office in regard to the exportation of lepers from Norway into this State.

In March last was reported to the State Board of Health, a case of leprosy in the person of a young woman aged twenty-four years recently arrived direct from Stavanger, Norway. She had been affected for ten years. The

Leprosy.

local health officers took cognizance of the case, and directed that she be sent to her brother at Chicago where she could be placed in a hospital. He refused to receive her, and she was taken to her father, near Le Grand, Marshall county, where she now is.

In June another case was reported from Le Grand, also recently from Stavanger, a married woman in an advanced stage of the disease, and which rapidly progressed to a fatal termination August 11th.

In both these cases there was studied effort to conceal the disease, the true nature of which was revealed only by persistent questioning by attending physicians.

Now, it must have been known to the health authorities of the place whence these women came, that they were lepers, or from leprous families.

As may be readily supposed the people of Iowa are greatly alarmed at this evident intentional importation of that horrible and contagious disease into this State. We therefore pray you, as their representative, to take such immediate measures as may be deemed necessary to prevent such outrages.

Consul Gade suggests previous medical examination, but that is not sufficient. The prohibition should include all persons known to be of leprous families, for the incubation period of leprosy varies in different individuals, from a few weeks or months, to ten years. It not unfrequently skips a generation, so that a medical examination could not detect an infected person in whom the incubation was slow.

Consul Gade will be further advised, so far as possible, to aid in tracing the initial point of these cases, and how and why they came to Iowa.

Whether the necessary relief can be had through the Secretary of State, or by an act of Congress, you are best informed. We earnestly ask that you give the subject early attention. Very respectfully,

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

UNITED STATES SENATE,
WASHINGTON, Sept. 6, 1888.

J. F. KENNEDY, M. D., *Secretary:*—I have yours of the 1st inst., with letter of Mr. Gerhard Gade, U. S. Consul, respecting the exportation of lepers from Norway into Iowa. I will take great pleasure in giving the matter my personal attention, and will consult with the Secretary of State in relation to it. Will write you again. Very truly yours

W. B. ALLISON.

DEPARTMENT OF STATE,
WASHINGTON, Sept. 12, 1888.

THE HON. W. B. ALLISON, *United States Senate:*

SIR:—I have the honor to acknowledge the receipt of your letter of the 6th instant, relating to the complaint made by the Iowa State Board of Health, that persons afflicted with leprosy had been deported from Norway into the State of Iowa.

Our minister at Stockholm has been directed to lay the matter before the Norwegian Government, with a view of preventing the recurrence of similar cases in the future.

Returning the enclosures to your letter as requested, I have the honor to be, Sir, your obedient servant,

T. F. BAYARD.

At the November meeting, 1888, the State Board adopted the following resolution, copies of which were sent to all Iowa delegates in Congress:

WHEREAS, There has been imported into this State, direct from Norway, within the past year, two cases of leprosy, in violation of every principle of comity between nations, and endangering the lives and health of the people of this State, therefore be it

Resolved: That this State Board recommends that the Congress of the United States enact a statute

First. That no person infected with leprosy shall be permitted to enter the United States.

Second. That every person immigrating to the United States from Norway or Sweden, or from any place where leprosy prevails, shall procure a certificate from a physician, properly attested by some health officer or like officer, certifying that he or she is not affected with leprosy; is not a descendent from a leprous family, and has no relatives in the co-lateral line who are lepers.

Third. That every immigrant coming to the United States who has sojourned or resided where leprosy prevails, shall during their residence in the United States, be inspected not less than twice each year, by some competent physician or person, appointed by the health authorities of the place wherein they reside.

Fourth. That the penalty for a violation of such statute shall be the immediate return of such person to the place from whence he came.

Resolved: That the Iowa Representatives in Congress be, and they are hereby earnestly requested, to vote for the enactment of such a statute, and that the Secretary of this Board is instructed to furnish said Congressmen a copy of these resolutions, duly signed by the President and attested by the Secretary.

Although no legislative action was taken by Congress, measures were perfected by the State Department to prevent the shipment of lepers to this country.

MEASLES.

Measles is one of the most common diseases with which the human family is afflicted. So common is it, attacking young and old alike, if exposed, and if not protected by a previous attack, that people have come to regard it as one of the unavoidable dispensations of Providence. The idea obtains almost everywhere

that there is no use to try to avoid it—that everybody must have the disease at some time, and it is better to have it in childhood than in adult life.

There is a terrible mistake here. It is a wholly unnecessary disease. It exists only because of a settled belief in the opinions stated above in regard to the inability to avoid it.

It is purely a contagious disease. If there was not a single case in the United States for six months, there never would be another one unless brought in from abroad. *It is possible, by isolation and disinfection, to stamp out the disease.* If, through the carelessness of others, it comes into any community, it can, by appropriate means, be restricted to the family where it first makes its appearance.

Measles is not regarded as a very serious affection, and yet, taking the whole State, the number who die or are disabled annually, is very great. Many who do not die, only partially recover. Permanent injury to the eyes or ears, or pulmonary diseases, often result therefrom. Those who have the disease in their family, and have them all recover without serious complications, congratulate themselves, not only on escaping so well, but because they had the disease and are done with it. The neighbor living near by, whose children contracted the disease from exposure to those who have recovered, may not fare so well. One or two may die, or may be disabled for life. They will forever regret that the unnecessary importation of the disease was ever made into the community. It is as preventable a disease as small-pox, and there is no more excuse for its existence and spread than there is for small-pox. When a case occurs in any locality it is because some one has done a great wrong. If transplanted to any community, and it is allowed to become epidemic, a greater wrong is committed. It would save the State thousands of dollars annually, to say nothing of the loss of precious lives, and the entailment of useless grief, if the people generally would appreciate the fact that the disease is an imposition, and would act accordingly.

Statistics furnished by the Michigan State Board of Health show that over seventy-one per cent of all deaths from measles in the State were of children under five years of age, while but a little over eight per cent were of persons from ten to twenty years. The

Measles.

same percentage of deaths doubtless occurs in Iowa. It is therefore important to restrict the disease, and especially so that it shall not reach those in the second and third year of life.

The Iowa State Board of Health recognizes measles as a contagious and infectious disease. It should, therefore, be subjected to the same regulations, as to isolation and disinfection, as scarlet fever and diphtheria.

Whenever a health officer of a local board has reason to believe that there is a case of measles within his jurisdiction he should,

1. Promptly investigate the subject.
2. Order prompt and thorough isolation of those sick or infected with measles.
3. See that no person suffers from lack of nurses, or supplies.
4. Give public notice of infected places.
5. Notify superintendents or teachers of public schools, of families in which measles prevail.
6. Supervise funerals of persons dead from measles, and see that no public funeral is had.
7. Supervise the disinfection of rooms, clothing and premises, and all articles likely to be infected, before allowing them to be used by other persons than those in isolation.

Every person recovering from measles, whether the form is mild or malignant, should be considered dangerous, and should not be permitted to mingle with others, nor attend school, church, or any public assembly, until with the approval of the attending physician and the local board of health, he can do so without endangering others. Nor should any person from premises, where there is or has been a case of measles, be permitted to attend public school, church, Sunday school, or public assembly, until after a proper disinfection of the premises, and the clothing of such person, if it has been exposed, has been had.

To avoid measles, keep away from it.

Do not let a child, especially between one and two years of age, go near a case of measles.

Do not permit a person, dog, cat, or other animal, or a thing to come direct from a case of measles to a child.

Do not permit a child to wear or handle any article of clothing that has been worn by another during sickness or convalescence from measles.

Trichina Spiralis.

Do not permit a child to ride in a hack or a closed carriage in which has been a person sick with measles, except the vehicle has been thoroughly fumigated with burning sulphur.

Unless your services are actually needed, keep away from measles.

Do not permit a child to kiss a person who has a cough, or sore throat; nor take the breath of such person; nor drink from the same cup, blow the same whistle, chew the same gum, or put his pen or pencil in his mouth.

Beware of any person who has a cough or sore throat.

School teachers should be specially prohibited from going near measles, and this rule should be enforced by school boards, and local boards of health.

Where there is complete isolation of the sick, and no communication whatever had with other persons, except the physician and nurse, other adult members of the family can safely go about their usual vocation, avoiding children and public gatherings. This exception will not apply to school teachers, who may be living where there is measles. Such should leave the school, or change their residence.

TRICHINA SPIRALIS.

Trichina spiralis, is the specific name given to a nematode, or thread-like worm, by Prof. R. Owen, the great English naturalist, and first discovered by Dr. J. Hitton, in a body he was dissecting in Guy's Hospital, London, in 1835. Its effect upon the human body was not known until 1860.

It is scarcely visible to the naked eye; body very small, round, attenuated from behind forward; skin smooth, head pointed, mouth small. So small is this parasite that one anatomist estimated the presence of one hundred thousand in a cubic inch of gastrocnemius muscle (from the calf of the leg) of a female patient; another found eighty-five thousand in an ounce of hog's muscle; another five million in a single pound of human flesh; another fifteen hundred in fifteen grains of flesh. It is estimated that a hog weighing three

hundred pounds will contain thirty million of this parasite, while the body of a full grown man would contain ninety-four million. The number varies in different bodies, and in different parts of the same body. The abdominal muscles contain more than the arms and legs. They are more numerous in the diaphragm, cervical and masticatory muscles, and above all, the smaller muscles of the trunk.

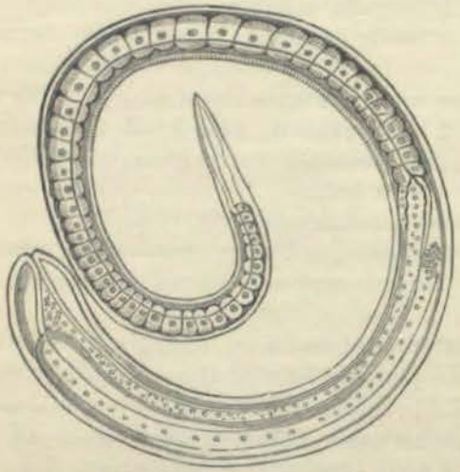

Figure 1. Trichina magnified 280 diameters.

The progress of the embryo is very rapid. Leuckart says the migration of trichinæ from the abdominal cavity to the remotest parts of the body, takes no more than twenty-four hours.

Although trichinæ infest many animals, the hog trichina is the only one which, in civilized countries, infests man.

As found in pork, it is in what is called the encysted form. When trichinous pork is taken into the stomach the encysted worm at once becomes vitalized, multiplies and begins to migrate. So soon as it reaches the end of its journey, whether long or short, or to whatever part of the body, it coils itself up, as shown in figure 5, and becomes encysted, surrounded by a capsule, or sheath. After becoming encysted, it becomes dormant, and if it has not already killed the patient, it may be carried through a long life without inconvenience.

SYMPTOMS.

Renz divides the disease trichinosis into four stages: First, the pedromal; second, intestinal irritation; third, muscular irritation; fourth, retrogression of symptoms and convalescence.

From a few hours to a few days after eating trichinous flesh the patient is seized with indigestion, complains of nauseau, stomach pains on left side, belching, diminished appetite, tongue coated, breath fœted, vomiting or eructations, feeling of general weakness,

prostration and utter exhaustion, a "so tired" feeling, flashes of heat, coldness, fulness of the frontal head, vertigo, sharp and flying pains in the muscles, particularly in the nape of the neck, and flexors of the extremities. After two or more days appears a choleraic discharge from the bowels. The vomited matter is first slimy, then billious. The stools at first brownish and streaked, take on the clay-like character of many typhus stools. Severe neuralgic pain is almost always present in the abdomen, also in the arms and legs, and sometimes in the intestines.

In the severest cases the patient may suddenly die at this stage of the disease with all the appearance of cholera, or from extreme exhaustion. Those who do not vomit become by degrees excessively debilitated. As the stools become less copious, and less frequent, they still retain their clay-like appearance. The pain in the abdomen becomes duller. Thus pass the first eight days of the disease. The diarrhœa may pass off and be succeeded by obstinate constipation, or may continue into the second stage.

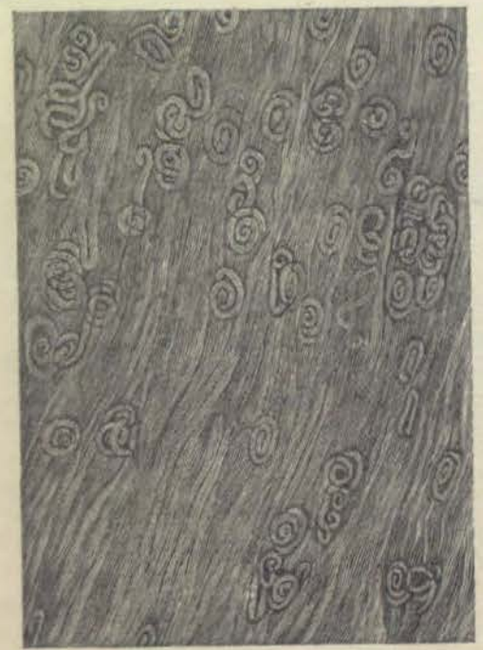

Figure 2. Taken from Deltoid muscle of a young woman who died.

The most important symptoms of the second stage are œdema (swelling) about the tenth day, and profuse perspiration, acid, and often of nauseating odor. The swelling usually commences with the eyelids and spreads to surrounding parts. This does not last long, and in some cases is entirely absent; sometimes it disappears to reappear again in four or six weeks. Pain in the orbital muscles especially in the morning, is present in all severe cases. The fever suddenly increases and may reach forty C, with the pulse at

Trichina Spiralis.

eighty to one hundred and twenty per minute; there is unquenchable thirst and overwhelming sense of heat; tongue furred, yellowish white, or covered with black, sooty, clammy coating, soon losing all mucous surface, becomes uniform dark brownish red, is smooth and covered with papillæ or blisters, and suddenly—generally in the night—there occurs extreme dyspnœa (labored breathing) often lasting several hours, and sometimes recurring for several weeks. The brain is undisturbed. Coma sometimes follows the dyspnœa. There is total indifference to surroundings, but great fear of death. Insomonia, or sleeplessness is present in adults, but does not often occur in children, who are apt to be sleepy. Delirium is occasionally permanent. Hearing is frequently impaired. If the patient has not been too much debilitated he may pass through this ordeal, but many succumb in a short time. The muscles of the neck, loins and limbs, particularly the flexors, show more or less stiffness and increasing tenderness, the latter constantly found on pressure, in the epigastrium, or stomach; swelling commencing at the body, proceeds toward the digital extremities. Motion is extremely painful, the elbows are bent, the knees drawn up; the patient finds ease only by lying flat on his back. Children usually lie on the side with knees drawn up, elbows flexed, and plunged in profound sleep. As a rule there is an extraordinary decrease in urine.

Fig. 3. From the same case as Fig. 1. Length of Trichina stretched out, 1.30 inch; diameter, 1.700 inch. Magnified, 38 diameters.

In the severest cases, which generally progress to a fatal termination, the pulse increases in rapidity, is small and weak; the fever takes on low debilitated form, or adynamic, and the patient

Trichina Spiralis.

becomes apathetic. The tongue, though more movable, is dry and trembling, respiration becomes more labored, and the patient lies flat on his back. In short, all the appearances of a fatal typhus fever are present. Pneumonia frequently occurs at the fourth week, the sputa being mostly blackish blood. Hiccoughs and picking the bed clothes usually precede a fatal termination. If there is progress toward recovery, there is, in the fifth week, a decrease of fever, reduction of pulse to ninety or less, the appetite improves, perspiration is less copious, urine increases, sometimes suddenly; the swelling disappears rapidly, and the only remaining symptoms are slight pains in a few muscle, emanciation, weariness and lassitude. A large number of the cases reaching the seventh week progress rapidly to convalscence.

Fig. 4. From the pork which caused the death of the case in Fig. 1., and also her mother.

Trichinosis of children is characterized by less danger, very copious collateral swelling, considerable dilitation or enlargement of the pupil of the eye, lessened muscular pain, ability to lie on the side, sleepiness and rapid convalescence.

SOURCE OF THE DISEASE.

In all cases known the hog has been the source of the disease in human beings, so it may be said of nearly, if not all cases, that they are caused by eating trichinosed pork, although the rabbit and the hare are considered not behind the hog in susceptibility to trichinosis. Hogs become infected mostly from rats, and rabbits and hares become mouse hunters in Winter. Muscle trichinæ are

more or less readily produced in all mammals, never in birds, and least of all in fishes.

PROPHYLAXIS.

Protection against trichinosis is secured only, first; by prevention of infection from the use of trichinosed meat; second, prevention of of trichinosed hogs; third, the eradication of trichinæ from hogs, and other natural bearers.

To be secure against trichinous infection, it is only necessary that the whole mass of meat shall be heated to a temperature of 150° Fah. Meat may be subjected to a high temperature and yet not be cooked through the entire mass. It should be cooked entirely through to the bone, so that there be no appearance of blood. Salt will kill trichinæ, but all salted meat is not innocuous. The salt must penetrate the entire mass. Kuhn found that hams were innocuous after thirty-one days' pickling.

Portion of human muscle enclosing a single capsuled Trichina. Highly magnified. By Leuckart.

Trichinæ possess an unusual power of resistance of heat and cold. Trichinosed meat kept frozen forty-five days, has been shown to be innocuous. The only safe rule is to eat no meat from the hog unless it has been thoroughly cooked. This rule applies to all preparations of sausage as found in the butcher's shops.

The use of trichinosed meat can only be prevented by a system of thorough inspection of all pork offered for sale or slaughtered for private use.

TRICHINOSIS IN IOWA.

In March, 1891, several cases of trichinosis occurred in Ida county, which were reported by Dr. G. C. Moorehead, to-wit:

IDA GROVE, March 20, 1891.

State Board of Health:

Eight miles south of Ida Grove is a settlement of German farmers, who, true to the customs of their forefathers, eat uncooked bologna sausage and treat their neighbors. This custom has resulted in a sad experience in the Werneburg family, and given rise to the much talked of cases of trichinosis.

The early history of these cases is lost, as they were first under the care of a "Country Doctor." Subsequently they were treated for an irregular form of typhoid fever, arising from water contamination. It was not until the 25th of February that the true nature of the cases was known, and three persons had died prior to that date.

January the 16th, Chris. Werneburg, a butcher by trade, slaughtered two large, fat and healthy looking hogs, and from the trimmings of the hams, shoulders and tenderloins, made a large amount of summer sausage.

The only method of curing this summer sausage is by seasoning, putting in casings and exposing to smoke for a few days. It is then eaten without further preparation by cooking.

January 25th the family, consisting of Chris., his wife and three grown sons, ate heartily of the new sausage. From then on it was eaten freely by the family. Six neighbor men, who chanced to be at the Werneburg home at different times, were treated to the new sausage, and ate a greater or less quantity of it. So far as can be learned, every one who ate of it subsequently showed symptoms of trichinosis. As all the cases presented similar clinical histories I will detail the history of but one case.

Theodore Funderman, aged twenty-five, a son-in-law of Chris. Werneburg, ate a small quantity of the sausage on February the 7th. Three days later he had slight diarrhœa, which continuing caused him to go to bed on the 14th. He then complained of great weakness and exhaustion. On the 17th he had slight cough and pain through the lungs. Considerable fever and rapid pulse, accompanied these symptoms. On the 19th œdema of lower eyelids was noticed, and some soreness of larger muscles. Three days later, this soreness of muscles was marked, especially the masseters were rigid, and movement of the jaw and swallowing were painful and difficult. An herpetic eruption now appeared over the abdomen. The next day, February 22nd, he became delirious. The delirium was of a mild grade, and lasted but a few hours. At intervals he was rational, but apathetic. This condition continued until death. On the 22nd he showed symptoms of catarrhal pneumonia, the expectorations having the "prune juice" characteristic color. Death occurred on the 24th, the 14th day of his sickness.

Exhaustion was rapid and extreme. The position of the body was on the back, with head elevated. All movements of the body and limbs were avoided so far as possible. This case differed in one point only from the others, the time from eating the sausage to first symptoms being three days. In the remaining ten cases, the duration of this incubating period was uniformly six days. From the first appearance of diarrhœa to time of muscular soreness was an average of twelve days, Œdema of ankles and feet, was present in all the cases, and began about the twelfth day of sickness.

There were in all eleven cases. Five have died, and one more doubtless will die. Five are convalescent. Of those dead, two died on the fifteenth day of sickness, one on the twentieth, one on the twenty-seventh, and one on the thirty-second. Pneumonia developed in all the fatal cases, from five to seven days before death. Of the five convalescents, only one showed symptoms of pneumonia.

No eruption appeared in the cases that recovered.

A peculiar offensive and cadaveric odor was constant in all the cases. None of these unfortunate people experienced much pain. They lay quiet, careless of their surroundings and condition.

In connection with other treatment, a fair trial was made of sulphur. It was given internally, and the entire body annointed with it. Two of the cases thus treated died.

The condition of the Werneburg family is peculiarly sad and unfortunate. The first death was the son-in-law, Theodore Funderman; next followed Mrs. Werneburg, then the father, and two days later, the youngest son. The only remaining members of the family are two sons, both of whom are cripples. The sad experience of this family should teach the lesson, that uncooked pork is a dangerous food, no matter how healthy looking the hog is when killed.

Dr. Rose, of the Department of Animal Industry of Washington, D. C., was here March the 16th, to see the cases, and have action taken to prevent the further infection of swine in this locality. Acting under instructions from him measures will be taken by the local health department to prevent the sale of hogs from this herd, which numbers about eighty, without first being subjected to careful microscopical examination.

G. C. MOOREHEAD, M. D.

RABIES.

During the biennial period there has been an unprecedented number of reports of alleged rabies from various sections of the State. The following case was reported from East Nodaway, in Adams county.

EAST NODAWAY, March 28, 1891.

Secretary State Board of Health:

Sometime in January last a dog supposed to be mad was running about in our township, and after biting a hog for one Lyman King, ran on in a northerly direction, attacked a dog belonging to one, F. T. Schraeder, whose dog was, at the end of the fight, covered with foam and blood, and was supposed to have been bitten by the other dog. The dog first spoken of, was finally killed on the same day, four or five miles northwest of Schraeder's place. Schraeder kept his dog tied up for nine days, claiming that that length of time would show if his dog would go mad.

Neighbors of said Schraeder would like to have the dog killed. He positively refuses to do so. Our board of trustees claim to have no authority to compel him to kill him. What can we do? Is there some law or some regulation of the board of health to compel Schraeder to kill the brute, or is there not?

The dog which was killed, belonged to one Graham, living in Douglas township, probably eight miles from Schraeder's place. Last Fall a strange dog went through Graham's yards, and bit two dogs and some stock. One of Graham's dogs died at home, the other was killed as stated above, and a steer of Graham's, supposed to have hydrophobia, was killed by him. So it seems to me there is some danger to have Schraeder's dog running at large.

In April the local board of Pleasant Grove township, Floyd county, reported the following:

PLEASANT GROVE, IOWA, April 9, 1891.

Secretary of the State Board of Health:

About the 20th of last November, a dog belonging to Chas. Ramsdell of this township went mad, and died after biting some of his stock. In about two weeks after the dog died, a yearling calf was taken with hydrophobia, and was killed Since that time he has had an occasional loss from the same disease, until last month when several died, two at a time, making nine in all; one new milch cow.

He burned the first carcass, but since that time has hauled them into the hog yard for the hogs to eat. There has been complaint entered to the board of trustees. What shall we do?

Early in April the Osage (Mitchell county) *Press* reported a case, to-wit.

James Connell, of Little Cedar, lost three valuable cows and two calves from hydrophobia caused from a dog bite last Fall. A few days ago he sold a number of head to Aaron Hatfield, and to the latter's great surprise, five out of the number came down with hydrophobia last week, and died. The animals appeared crazy-like, running ferociously through the field, striking against wagons, etc, until they dropped down in agony.

The following reports are taken from telegraphic dispatches to newspapers:

BRITT, Iowa, April 5.—A fearful epidemic of hydrophobia has taken the stock in Amsterdam township, Hancock county Two horses, two cows, and about a dozen pigs and calves, have died of hydrophobia during the past week. A Mrs. Ross was attacked by the same dog that bit this stock, but she succeeded in kicking him away until her husband drove the brute out of doors, and dispatched him on the doorstep with a well directed dose of shot. This was about three weeks ago When the stock was first attacked, Veterinary Surgeon Clark, of Humboldt, was called, who held a post mortem

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examination of one of the horses, and from anatomical analysis of the heart, spleen, liver and kidneys, said he had no hesitation in pronouncing it a genuine case of rabies, and a very bad one at that.

BRITT, April 13.—About March 1, a dog came to the farm of C. M. and C. O. Patrick, in Amsterdam township, Hancock county. They thought it was a neighbor's shepherd, and put him in the barn. In the morning their eleven horses were loose in the barn, and some had been bitten around the nose. Proving to be a strange dog they let S. Ross take him home, but Ross saw him snap at the baby and his wife (luckily without effect), and acting so crazy, that he shot him. It seems the dog was at a Mr. Marriage's where two cows went mad and died. At Patrick's three big, fine horses, one colt, two calves and some hogs have in the last two weeks gone crazy mad—kicking, biting and snapping—and had to be killed.

BOONE, June 1—A mad dog ran through one section of the town early in the morning, and bit several dogs and two cows, escaping then into the country. This afternoon the authorities held a special meeting and ordered the seven dogs killed, and all dogs in the city muzzled at once.

DUNLAP, (Harrison county), June 13—They are having lots of excitement eight miles east of Dunlap over dogs and cattle going mad. Within ten days past there have been thirteen cattle shot in one neighborhood, eight of them from one herd of George Runnels. The cattle appear to be dumpish, and then refuse to eat, become excited and wild, froth at the mouth, start at any moving object. One man was chased through the brush and trees for over a quarter of a mile before he could escape from one of the mad cattle. The steer saw the man in the brush and took after him; the man ran and dodged behind a small tree; the steer struck the tree with one horn with such force that it broke it off. The man managed to reach the next tree, and the ox left the other horn at the roots of that tree. They kept up this chase until they reached a six wire barbed fence; the man went over that, and the ox went through the fence, cutting it fearfully. This time the man succeeded in eluding his pursuer, and got away. The ox was shot nine times before being killed; five shots went entirely through the body. Mr. Runnels has eighteen head of cattle in this pasture, and whenever there is any sign of the disease apparent in an animal it is shot. There have been about twenty dogs in the vicinity killed, whose symptoms are identical with those of the cattle.

One child of James Fantz was given milk from a cow that was shortly afterward affected as the rest of the cattle, and was shot. The child shows desperate symptoms of hydrophobia, and is in a critical condition.

HAMPTON, (Franklin county), June 19—About five weeks ago, a mad dog went through West Fork township, and bit several other dogs, and as it now turns out, bit several cattle belonging to Mr. Messerschmidt, living in the Nolte neighborhood. All dogs that were known or suspected to have been bitten, were promptly killed, but Mr. Messerschmidt's cattle have commenced dying, and up to last Saturday, five had died with every symptom of hydrophobia. The case excites much apprehension in that vicinity, and well it may.

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The Webster City *Herald* of July 15th, says:

Veterinary Surgeon C. H. Hunt was called to Lehigh yesterday to treat a case of hydrophobia in a cow. He reports several cases in that neighborhood, three cows belonging to Henry Wydick, having died. This animal that he went to see was thoroughly mad, and would rush savagely toward any moving object. They finally shot her, and the doctor made a post-mortem examination in hopes of being able to benefit cases of this nature in the future. Farmers and others should be careful to kill any dogs showing signs of rabies, as domestic animals when once bitten, are almost sure to die in spite of any medical assistance.

The Keosauqua, Van Buren county, *Democrat* says:

There is more hydrophobia in this section than there has been known before for many years. There has not only been a good many dogs afflicted, but there has been considerable loss of cattle. T. P. Pond, of Village, Hugh Baker of this township, and a number of others, have been losers. The latest case is that of a cow of James Slutts, of Mt. Zion. When found she was pawing a great hole in the earth. By some means she got in the railroad stock pens, and a number of people went out from here to see her. It is said if any one would imitate the barking of a dog the animal would become absolutely furious, and would lunge against the fence, and bite and strike at everything in sight. She would also bite everything thrown into the pen, and kept biting the boards in the fence almost constantly.

August 1st, a report from Henry county says: "Rome has been thrown into a spasm of excitement by mad dogs. One animal attacked a little boy named Field, and dragged him a considerable distance, terribly lacerating him. The brute next attacked Mrs. Westfall, and bit her in several places. The lady left for Chicago at once to be treated. A subscription was taken up to send the boy also. Before the dog was killed, it bit a large number of horses, cows and sheep. The greatest excitement prevails, and it is feared the epidemic will be general."

C. H. Hunt, veterinary surgeon at Webster City, makes the following report of the case at Lehigh:

WEBSTER CITY, July 17, 1891.

Secretary of State Board of Health:

On July 14, 1891, I was called to investigate the suspected case of rabies at Lehigh. On arrival, I found a cow surrounded by a rail fence, that no ordinary person could ascend. She was very much excited. I first thought it was some brain affection, but after inquiry, I diagnosed rabies. In the pasture there was nothing to be found deleterious. There was a little water in a ditch which ran through the center of the pasture. The water usually

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given the cattle, was taken from a deep well, and appeared good. I ordered the cow to be killed; I then opened her, but having several sores on my hands, I did not make a very careful examination. The digestive and urinary organs were unchanged. It was stated by the owner that the bowels were slightly constipated, and there were frequent attempts to urinate. Two cows had previously died with the same symptoms in about seven days from their first appearance. They would masticate hay, but were unable to swallow.

The owner of the cow had a dog that for some time acted very strangely, and mysteriously disappeared.

It will be seen that in all the foregoing cases there was no effort made to save the dog to determine whether or not he was affected with rabies, a very important fact to be established; nor is there a single authenticated case of true rabies.

It may be safely stated that not one suspected dog in ten is really infected. True rabies is rarely seen. Very few physicians ever see a case. There are many diseases of dogs, having symptoms closely resembling rabies, such as epilepsy, angina or sore throat, gastritis and enteritis, distemper, foreign bodies in the mouth and throat, tetanus, worms in the frontal sinuses or in the small intestines, and ulceration of the inner ear. Hence the importance of knowing the fact. By killing the dog there is no way to quiet the excitement in a community, which usually exists on the appearance of a "mad dog." It should be borne in mind, also, that of persons bitten by dogs affected with true rabies, not over five per cent become infected.

There are two forms of rabies—the furious and the paralytic. In the former, which is the most frequent, the animal affected is delirious and disposed to bite. In the latter the animal is silent and paralyzed.

There are three stages of the disease. The time required for their development is different in different animals, being more rapid in some than others, the transition from one stage to the other being almost imperceptible. These stages may be distinguished:

1. The prodromic, or melancholy.
2. The irritative, maniacal or furious.
3. The paralytic.

The first symptoms are a change in the behavior of the animal. It is uneasy, sullen, restless. It becomes dull, seeks to hide around

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in corners, under the house or stable, under furniture, but no sooner has it lain down and fixed itself for rest, than it suddenly starts up, goes to another place, and lies down, only to move again. Its movements are rapid. There is no disposition to bite, indeed it is frequently unusually affectionate, manifesting a desire to be fondled, and especially to lick the face and hands of those fondling it. Frequently there will be noticed a change in the tone of voice, when attempting to bark. It is between a bark and a howl, the muzzle being raised. The voice is peculiar, and once heard cannot be mistaken. There is a tendency to lick cold objects, as iron or stone, and to gather up bits of straw, wood, etc., and carry away. If met by another dog, to lick its cold nose. As the disease progresses it scatters and tumbles about its bed, and is in incessant motion, going from place to place, digging the earth, snuffing in corners. There is no propensity to bite, is docile, obeys the command of its master for a moment quite rationally, but quickly relapses into its gloomy restlessness. Its restlessness increases. If in a kennel he piles up the bedding and buries its chest in it, and then tears it down in rage. If in a house, it tears carpets and cushions.

It has a morbid appetite, rejecting its ordinary food, touching only a few favorite bits, but will swallow all sorts of indigestible stuff, like hair, straw, dung, rope, earth, leather, etc. There is difficulty in swallowing, and disposition to vomit. Its movements begin to show signs of uncertainty. The duration of this stage is from half a day, to two or three days.

The symptoms of the second stage appear only spasmodically. There is entire refusal of all food, a propensity to bite; a marked change in the voice, and propensity to stray off. If confined, will struggle to get loose, bite the chain, tear the kennel. There is marked abberation of mind. It will gaze into space and at persons with a vacant stare, and if alone, will sit as if listening for some object, its eyes following it in space, when suddenly it will spring forward to bite. The voice of its master will rouse it from its delusion, and it will answer with signs of attachment and pleasure. This peculiarity of unusual affection of the animal, is one of the most dangerous symptoms, because the animal may thus be dangerously permitted its freedom. It is not the animal's teeth that are to be avoided, but the pervidious tongue, moist with virulent

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saliva, which if brought in contact with an abraided skin on the hands, is as fatal as a wound from a tooth. The saliva is virulent at least eight days before the symptoms of the disease are well marked.

It sometimes will make furious attempts to wipe off imaginary substances from its jaws with its paws, and if in doing so, it should tumble over, there can be no mistake in the disease. There is a peculiar change in the voice, which is rough, hoarse, short, sharp, and such as is heard in no other disease of this animal.

There is no dread of water at any stage of the disease; in fact the animal will drink water so long as able to swallow, and frequently unable to swallow, will thrust the entire head in water. The mouth is dry and parched. It is, therefore, erroneous to call the disease hydrophobia, which means dread of water. The flow of saliva comes at the closing stage.

An invariable symptom of true rabies is the impression made at the sight of another dog, which is so powerful as to excite instant fury. If at large, the animal will go as far as it can see another dog, passing persons and animals, to bite it. This is true of all rabid animals except man. The rabid dog is silent when biting, or teasing his victim, contrary to a healthy dog, who makes considerable noise. This stage lasts not longer than three or four days, and is the period of actual rabies.

Not all the symptoms given are present in any case, but enough will be discovered to enable any person to protect himself. It is during these two stages that the animal has lucid periods, which mislead the owner into insecurity, yet there is great danger at this time, and the animal should be securely chained, or confined, with no doors nor windows, for in paroxysms of fury it exerts wonderful powers, frequently breaking very stout chains, or strong inclosures.

The third or final stage, develops the most ferocious instincts. There is an unmistakable change in the face and eye, to that of fierceness and terror. If confined, the animal at the sight of a person, will spring at them with a peculiar bark. If at large, it will bite whatever comes within reach. If a stick or even red hot iron be thrust at it, it will seize it and gnaw it furiously, being insensible to pain.

If the dog is not restrained, it begins to run rapidly, as if by some irresistible force, attacking every living being it meets, darting

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hither and thither to bite a dog, making not a sound—merely a snap and onward, the degree of ferocity being somewhat influenced by the natural disposition of the animal, whether mild or fierce.

At a distance no peculiarity is seen to indicate its true condition. The gait is steady, tail erect, swinging from side to side—not drooping, as generally supposed. Later on, as the disease progresses, the step becomes unsteady, the head drops low, the bloody tongue hangs out, the tail hangs listlessly, the sight begins to fail, and he may be found lying in ditches, along roads. Though less dangerous, he can bite, and the saliva is more dangerous than ever. After wandering about for hours, sometimes days, the dog returns home, a most pitiful object, incurring extreme danger from the usual desire to feed and caress him, in ignorance of the nature of the disease.

Emaciated and exhausted, the last stage is reached. Sharp sounds and pouring water, a puff of air on the body, a stamp of the foot, will cause paroxysms and horrible shrieks, which are followed by lassitude and exhaustion, until paralysis ensues, first in the hind limbs, causing it to stagger about. The whole appearance of the animal changes rapidly. The eyes become dull and squint, the voice is husky. The paralysis increases until it cannot rise, which is the prelude of the stupor which follows, broken only by tetanic muscular action, until comes the certain death from paralytic asphyxia.

The maximum course of this disease is ten days; it may run in as many hours.

In mute, or paralytic rabies, the symptoms are the same as in the other form, except that from the outset the voice is lost; there is no barking, but instead a dismal howl. The lower jaw is paralyzed, hence there is no biting. The mouth is constantly open; eyes wide open, with no expression, and always fixed in one direction; there is no disposition to move, but rather to lie down; there is no inclination to bite, but the saliva is just as poisonous as in the furious form.

After death of the dog, the tongue and mucous membrane of the mouth and stomach are blue or nearly black. In the stomach is found a black fluid, like coffee grounds, and a collection of substances which no healthy dog swallows, as wool, hair, straw, pieces of wood, cinders, soil, fragments of cloth, carpet, etc.

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RABIES IN THE CAT.

The symptoms of rabies in the cat are the same as in the dog. The rabid cat is more to be feared than a dog, for the reason that it is most likely to attack a person upon the head and face, and wounds on these regions are the most dangerous.

RABIES IN MAN.

Rabies in man assumes the two forms as given for the dog, but the delirious or furious, and convulsive are most frequent. Says La Rage, of Paris:

The convulsive form divides itself into three periods:

1. Melancholia, following immediately after the period of incubation, when the patient becomes sad, taciturn, avoids all society, has somber forebodings, constant and intense headache, disturbed sleep, startling dreams; and these whether infant or adult, or whether aware of exposure or not. In some cases there is itching, or pain at the seat of the wound. There is frequently an irresistable desire to walk about or run; there is a general exhaltation of muscular and nervous excitability, instead of melancholia. This first stage usually continues four or five days. It is sometimes wanting altogether.

2. A general condition of over excitement, difficult and painful respiration; inspiration short, with frequent sighs; all the spinal nerves are affected; there is spasmodic contraction of the special muscles of the pharynx and larynx on attempts at drinking. There is increased activity of all the senses, as with the dog. Noise, sight or sound of water, the slightest current of air, a sound however feeble, a brilliant object, an odor, will provoke a convulsive spasm, with protrusion of the eyeballs and threatening asphyxia. These are the truly characteristic symptoms of rabies. There is no such dread of water as to warrant the use of the term "hydrophobia." The spasm of the muscles of deglutition at the sight of water is only a part of the general reflex excitability shown by the fact that so many other objects will cause like spasms. The patient would drink if he could. About the second or third day, there is frequent spitting; the mouth, at first dry, becomes moist and fills with mucus and froth. In many cases there are hallucinations of sight and hearing. The voice becomes rough, hollow, convulsive,

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spasmodic, broken, sometimes resembling the bark or howl of a dog. During the convulsions the patient often wounds or bruises himself. He still inclines to run, and get away from home. These attacks alternate with melancholy and despair. The temperature runs high, and increases the first hour after death, sometimes reaching 43° C. (109° Fah.).

3. Paralysis reaches all the organs; the mind is clouded; intelligence obscured; the patient is exhausted; the centers of respiration and circulation become paralyzed, and death ends the scene.

RABIES IN CATTLE.

Boulay gives the following symptoms as disclosed in twenty-seven head of cattle, who had rabies and were all bitten by one dog.

First day. Slight colicy pains, or something very like, as the animal no sooner lies down than he gets up again. The senses are excited, there is very sudden rise in temperature, itching pains at the seat of the bite.

Second day. Less agitation, slight tenesmus; lower temperature of the body and at seat of the bite.

Third day. Commencing paraplegia (paralysis of the lower half of the body); strong tenesmus (straining at stool), the discharge from the bowels covered with mucus of a yellowish brown tint; spinal column not sensitive to pressure, and temperature falling. These symptoms are accompanied by bellowing.

Fourth day. Complete paraplegia; violent straining to stool; excrement covered with frothy mucus; foaming at the mouth; bellowing more frequent.

Fifth day. Same symptoms, with considerable fall in temperature; bellowing more rare; sense of taste not impaired. Death by paralysis.

It is not proved that cattle bite each other when rabid.

In three-fourths of these cattle, the incubation period was three to six weeks; in the remainder six weeks to three months.

Fleming, the celebrated English veterinarian, says the symptoms in the cow are: loss of, or depraved appetite, prostration, great restlessness, increased excitability, muscular trembling, nearly constant flow of saliva from the mouth, exaltation of sexual desires, difficulty in swallowing, manifestation of disagreeable sensations in the seat of the wound, and hallucination. These are the first signs. Paroxysms soon follow, and during these, the eyes are staring, brilliant, haggard-looking, and dejected, the pupils are dilated, the mouth hot and foamy, and the voice is changed to a dull, hoarse

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sound. The animals are greatly excited, bellow frequently, agitate the jaws, paw with the fore feet, throw up behind the earth or their litter; they fall down, roll about, if fastened try to escape; there is trembling and twitching of the muscles; if a cow, the milk is suspended; frequently there is a disposition to attack other animals and people. They strike with the horns (or head if hornless) at obstacles in reach, often with such fury as to fracture the horns. They rarely attempt to bite; they sometimes jump on other cattle; the appetite is generally lost, and rumination ceases, but when the appetite is present it is depraved. The fæces, at first expelled at long intervals, in small quantity, often with such effort the rectum is protracted, later become liquid, and pass involuntarily. Emaciation becomes extreme; then comes paralysis of the hinder extremities; the cattle lie down, can not rise, and die in profound coma.

The disease in the bovine species seldom exceeds four to seven days.

RABIES IN THE HORSE.

There is first restlessness; biting at the seat of injury; frequent change of position; sudden starting as if from fright; unusual excitability; sensitiveness of the eye to light; fixed, staring gaze; dilation of the pupil of the eye; movement of the ears as if strange sounds were heard; there is hallucination; increase of sexual desire, especially in the stallion, who neighs with a harsh tone, while the mare will stand with hind legs wide apart. As the disease progresses, quivering of the skin is observed, soon followed by convulsions; loss of appetite, and difficulty in swallowing is frequently noticed. During the paroxysms, the animal kicks viciously, and bites so furiously at any object in its way that sometimes the teeth and even the jaws are broken. It will even bite its own body. The presence of a dog will induce paroxysms. After the paroxysm, the faculties are more or less regained, the respiration becomes accelerated, and the voice hoarse and unpleasant. Each succeeding paroxysm becomes more intense, and more frequent. Exhaustion follows rapidly, paralysis of the hinder extremities ensues, when the animal lies down, and after the second to the sixth day from the first symptom, life ceases in a convulsive paroxysm.

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THE INCUBATION PERIOD.

The incubation period of rabies in dogs is less than two months in eighty per cent of the cases. It rarely passes six months, though cases are recorded of a longer period.

In the cow, or ox, the period is given by Röll at nine days to several months. Haubner says of two hundred and thirty-four cases, ten per cent occurred after three months, and eight per cent, four to nine months.

In the horse the period is, according to Röll, fifteen days to two months. Lafoose records cases of ninety-two days. The general average is probably the same as in the dog.

The incubation period in man, according to Brouardel, of France, who investigated two hundred and sixty-three cases, is oftenest within two months after inoculation; rarely after three months, and with exceeding rarity after six months.

PREVENTIVE MEASURES.

It will be seen by the decision of the Attorney General, in another place in this report, that local boards of health have ample power to require dogs to be muzzled, or restricted from running at large, and for violation of such regulations the dogs may be killed.

When a dog is found running at large, acting strangely, and suspected of being mad, he should be caught and secured safely, where he can be fed, and kindly treated for a week or ten days, when, if he is rabid, it will be manifested beyond any question. Bear in mind, the probabilities are as nine to one that he is not rabid. By this method, if any person, or other animal, has been bitten, the fact will be known as to whether or not he was rabid. Never kill a dog suspected of rabies. If a suspected dog has been killed, cut off his head, and (if in warm weather, packed in ice,) send it by express to Prof. M. Stalker, State Veterinary Surgeon, State Agricultural College at Ames, with express charges prepaid, notifying him so far as possible of the circumstances and facts of the case, by mail or with the package.

It is well known that rabies is transmitted by the bites of dogs. There is no assurance when a dog is not affected. The only security from danger, therefore, is to reduce the possibilities of a dog to

Rabies.

bite. This is found in the muzzle, which, if properly made and fitted, causes them no trouble nor inconvenience.

The value of the muzzle in suppressing rabies has been demonstrated in many instances. In Berlin all dogs wear muzzles, and a case of rabies has not been reported there for ten years. In Sweden, where the muzzle is used, rabies is not known. In the Grand Duchy of Baden, since 1889, when the muzzle was rigorously applied, there has been but one case, and that of a dog from Metz, where the muzzle rule is not enforced. In London, in 1885, rabies prevailed to an alarming extent, and there were twenty-seven deaths. In 1886 the muzzle rule was rigidly enforced, and there was not a case of rabies for the year.

It should be borne in mind that while the muzzle will protect indirectly against rabies, no muzzle ordinarily put on dogs, will be retained a single moment against the maniacal ferocity of rabies, when even the teeth and jaws are broken in biting.

WHEN BITTEN—WHAT TO DO.

The recommendations of Pasteur, who is now acknowledged authority on rabies, are, that when a person is bitten by a suspected rabid animal, suck the wound instantly and thoroughly; if on an extremity, bind a handkerchief or band quickly as possible, tightly around the limb between the wound and the heart, so as to encourage free bleeding. Cleanse the wound thoroughly with hot water, or a saturated solution in hot water of boracic acid, which will also aid bleeding. Also, dress frequently with the same, or with a saturated solution of boracic acid in glycerine, or with a solution of carbolic acid, five parts to one hundred of water, or by corrosive sublimate solution, one part to five hundred of water. The use of strong caustics, and red-hot irons, is of no benefit, but an injury.

When the wound is thoroughly cleansed, it should be allowed to heal.

Actinomycosis.

ACTINOMYCOSIS.

This is comparatively a new parasitic disease, or it may be said, a new name for several old and well known diseases, hitherto considered to be of scrofulous origin, but which within a few years, have been demonstrated to be etiologically identical, having their origin in the same source—a fungus.

It affects man, cattle, horses and hogs, and is infectious. It may be transmitted from animal to animal, and from animal to man.

In Germany, when in cattle it affected the bones; the farmers and dairymen called it "windorn," "ladendruck," "dickerbacken," "knockenwurm," etc., while veterinarians called it "osteosarcoma, "spina ventosa," "bone tuberculosis," etc. When the soft tissues of the head were affected, the farmers and dairymen called it "holzzung," "hohlgeschwalste," "wurm" "schlundbeulen" (throat-boils), etc., while veterinarians called it "tuberculosis," "chronic interstitial glottis," "sarcomatotis, etc. In Italy it was called tuberculosis of the tongue. In England it was called scrofula, tuberculosis, tubercular stomatitis, miliary tubercle, schirrus tongue, glossitis, osteosarcoma, osteoporosis, and various other names.

In this country it is commonly known as "lump jaw."

It affects animals mostly between three and six years of age. It occurs at all times of the year, but more commonly in Winter.

In animals, Rosenback, Ponifeck, Israel and Fleming remark on the tendency of the disease to orginate in the teeth, or their sockets, forming tumors or abscesses, displacing the teeth, invading and destroying the healthy tissues, bones, muscles, mucous membrane, and skin. Also appearing on the tongue, in nodules from the size of a hemp seed to that of cherry or walnut, at first white or greyish

white, moist-looking at first, and soon becoming ulcerous. Subsequently, the tongue becomes slowly hard and swollen, and eventually hangs from the mouth. These nodules may be single, or in clusters.

When in the jaw, the lower is most frequently seized, at a spot corresponding to the roots of the third or fourth grinder, first appearing a small swelling, which grows in some cases rapidly, until in a few months the larger portion of the jaw is invaded.

The disease also appears in the fauces, larynx, nasal chambers, œsophagus, stomach and intestinal canal, lungs, udder, and skin, and always in the nodular, or turmorous form.

In man, the disease commences in the soft parts, as fungoid, suppurating granulations, which ulcerate, and finally proceed to the bones, inducing in the latter, caries or necrosis, with everlasting chronic suppuration, says Bodamer, Physician in Chief to Philadelphia German Hospital, and sometimes leading to hyperostosis of the affected bones. Most commonly, the disease seems to commence as a pleurisy, which takes a chronic course, terminating in ulceration of the adjoining bones, *viz.:* the vertebral column and ribs.

The most important point for consideration is, that the disease is transmissible from animals to man, and this has been demonstrated beyond question. Maydl reports a case in 1889, in which a veterinarian engaged in meat inspection, was required to examine a large number of cattle passes. In doing this, he moistened the volar (palm) of the right thumb with his tongue. Some time after, he felt a soreness in the tongue. In a few days there formed a small lump about the size of a pea, which in two months, increased to the size of a bean, and when opened contained pus and actimonycosis granules.

Another case is mentioned where a coachman affected with actinomycosis of the jaw, communicated the disease to his wife.

Dr. Bryce, secretary of the Ontario Provincial Board of Health, reports a case investigated in 1890, in which the disease was communicated to a child, from cow's milk from which it was raised, the cow being a calf of a cow that had the disease of the jaw when pregnant with and raising this calf. The growth upon the child consisted of a wen-like structure about two inches in diameter, situated upon the anterior portion of the upper jaw. The interior of

the wen was of spongy nature, filled with small cavities, which were filled with granular pus. The microscope dislosed the presence of the parasite, or typical ray fungus in the pus granules.

Recent investigation and observation has disclosed many instances of this disease in man. Prof. Crookshank, of London, says he has transplanted the disease from man to a calf.

The fungus is allied to the common green mould which grows on jam, paste, damp leather, etc. It is found in the husks or chaff of grain; in smut of corn, hence it has been observed that the disease is most frequent after cattle have been fed on straw, barley and chaff, straw being, as well known, so often mouldy. It is also believed to exist in wild rye, a pest which is rapidly spreading over the prairies of this State. In fact, it is the general opinion of the best observers, that it has its origin in the cereals.

It differs from all the ordinary green moulds, in the radiating of the mycelia or tendrils, and has been given the name actinomyces.

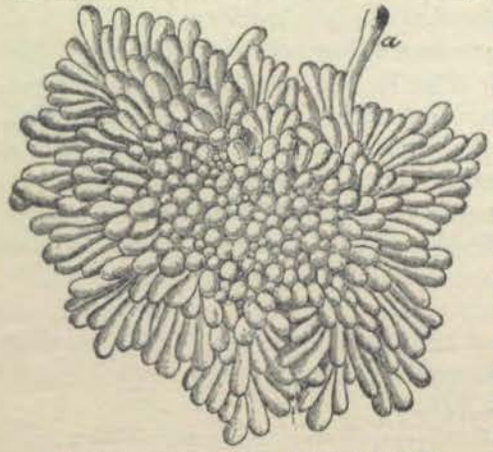

Fig. 1. Unsymmetrical *Actinomyces* Tuft.

It occurs as small globular masses, about the size of a pin-head, usually of pale yellow color, sometimes white, brown, green or speckled. Each mass consists of a central core of closely woven threads, from which radiate a multitude of filaments which swell out at their ends into club-shaped bodies; these form the outer part of the mass as shown in Figures 1 and 5. In man, the clubbed bodies are commonly absent, and the growth consists of radiating filaments alone.

When closely examined, many of the club-shaped cells, toward the periphery, will be found standing out prominently from the others.

Here and there are fine, pale, faintly shining, single mycelium threads springing from the depths of the tuft, and appearing beyond the margin (Fig. 2, *a*). Another tuft, or portion of one,

Actinomycosis.

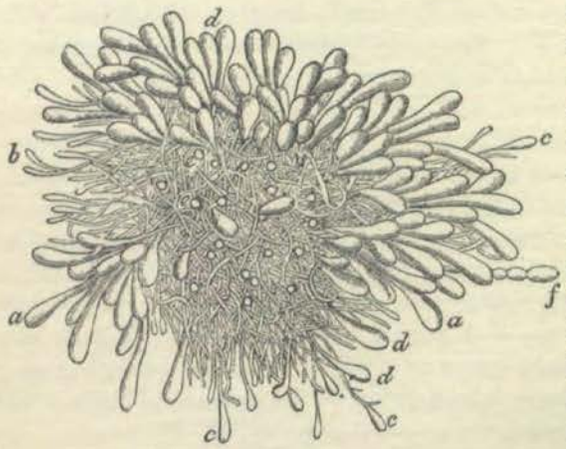

Fig. 2. An *Actinomyces* Tuft.

mainly consists of such mycelium or hyphen-threads(Fig. 2, *b*). Very exceptionally, there are seen at the peripheral end of these fine threads a delicate, pear-shaped expansion (Fig. 2, *c*); and among them are larger pear-shaped clubs or cells, often crowded together (Fig. 2, *d*); while not unfrequently are noticed isolated, and general small tufts, which appear to be composed only of the very finest mycelia, which Harz believed aborted forms, but which Johne considers young growths. Within the zone of the tuft (Fig. 1), and especially toward the center, are not only the upper surfaces, or ends of the larger club-shaped cells visible, but also small shining corpuscles, which resemble micrococci. (Fig. 2, *e*). In the center of the tuft, in addition, are extremely fine, but not numerous, myceliæ; and beyond these, passing direct toward the periphery, are many mycelia, with their extremity expanding into a long pear-shaped body (Fig. 2, *c*), which has received the name of Conidium, and of which there is one for each thread, as shown in Fig. 3.

Fig. 3. Mycelium and Conidia of the *Actinomyces*.

Fig. 4 illustrates an actinomyces cluster, surrounded by a large number of large cells, taken from the lung of a cow. The actinomyces is said to be the only fungus belonging to that class of moulds that have been found in the interior of animal tissues. The manner in which the fungus invades the tissues, has not been definitely determined, but the weight of authority is that it enters, in the form of spores, through a wound, abrasion, fissure, or even by the delicate mucous follicles of the membrane lining the lips, mouth, pharynx and nostrils—in fact any part of the digestive or respiratory canal.

Hog Cholera.

TREATMENT.

The only treatment of actinomycosis is with cutting instruments, or caustics, the object being the extirpation, or destruction of the spores of the fungus.

THE SANITARY IMPORTANCE.

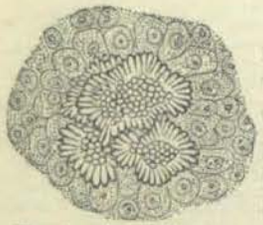

Fig. 4. An *Actinomyces* Cluster surrounded by a number of large cells. From a cow's lung.

It having been demonstrated that actinomycosis can be transmitted from one animal to another, and from animals to man, and that the spores of the fungus, alike destructive to man and beast, may invade the body by a trifling scratch or wound, resulting in death, the sanitary importance of this disease is evident. Those who go about diseased cattle should exercise extreme caution. Whether or not the meat of animals affected with actinomycosis is fit for food is a mooted question, but upon general hygienic principles it may be safely asserted that the flesh of all diseased animals is unfit for human food, whether the disease be contagious or not. In several countries in Europe the use of flesh of animals affected with actinomycosis is absolutely prohibited. Says Dr. Solomon, of the National Bureau of Animal Industry: "It is difficult to draw a definite line between cases so severe as to make condemnation necessary, and those so mild as not to injure the meat."

HOG CHOLERA.

The extensive outbreaks of hog cholera in Iowa, have suggested the publication of this article compiled from the fourth and fifth annual reports of the National Bureau of Animal Industry of experiments made on the farm of the bureau, and elsewhere.

These reports have demonstrated that the hog cholera and swine plague are caused by two distinct germs, or bacilli, and that they are two different diseases. The latter is so unfrequent, and the tendency is so great to confound the two diseases, it is intended herein to give information relative to cholera only.

Hog Cholera.

The two diseases may exist independently. There may be cholera in a herd of swine without the plague, and *vice versa*. The distinctive feature of the plague is that it affects the lungs, and of cholera, that it affects the intestines, though the intestines are more or less affected when the plague prevails, but lung lesions are rarely seen.

In either case, treatment is not recommended, for the reason that no specific, nor remedy is known in veterinary or human medicine that will cure ulcerative diseases of the large bowels, except time, careful dieting, rest, and paliation for pain, all of which is impossible to carry out with swine. Of the numberless advertised and alleged specifics and cures, the best were tried and found of no value. The only course recommended is that of prevention.

INDICATIONS OF THE DISEASE.

The presence of the disease is indicated by a cold shivering lasting from a few moments to a few hours; frequent sneezing, followed by loss of appetite, rough appearance of the hair, drooping of the ears, stupidness, attempt to vomit, tendency to root the bedding, to lie down in dark and quiet places, dullness of the eye, often dim, sometimes swelling of the head, eruption on the ears and other parts of the body, dizziness, laborous breathing, vitiated appetite for dung, dirt, and salty substances, accumulation of mucus in inner corner of the eyes, discharges from the nose, fetid and offensive odor of discharges from the bowels, offensive exhalations, diarrhœal discharges are semi-fluid, of greyish-green color, and often mixed with blood. In many cases, on the skin on the belly, between the hind legs, behind the ears, and even on the nose, are numerous red spots, which toward the fatal termination, turn purple. As the disease progresses, the animal becomes sluggish, the head droops with the nose near the ground, but usually will be found lying down with the nose hid in the bedding. If there has been no costiveness, about two days before death there will be offensive, fetid discharges, the voice becomes faint and hoarse, the animal is stupid, emaciation increases rapidly, the skin becomes dry, hard, and very unclean, there is a cold, clammy, sweat, and death soon follows with convulsions, or gradually by exhaustion, without struggle.

In chronic cases, or those of longer duration, the animal becomes weak, lies down most of the time, eats but little, and has diarrhœa.

Hog Cholera.

These cases may linger for few weeks, scattering the poison of the disease in the discharges, wherever they go.

APPEARANCE AFTER DEATH.

In acute cases of cholera after death, the spleen (milt) will be found enlarged and very black. Spots of blood from a pin head to one-quarter inch or more, will be found in the fat under the skin, on the intestines, lungs, heart and kidneys. On opening the large intestines they will be found covered with these dark spots of blood. Frequently the spots are covered with clotted blood.

Kill an animal in the chronic stage, open the large intestines, and there will be found circular yellowish, or dark spots, or ulcers. These ulcers may be frequently seen from the outside as soon as the bowels are opened.

In the plague, the lungs are the principal seat of disease. The bowels may become involved, but there are not present the peculiar ulcers as in cholera. The rectum is usually invaded, which is seldom the case in cholera. The plague is transmitted to other animals only by contact.

CAUSE OF THE DISEASE.

Hog cholera is analagous to typhoid fever, dysentery and Asiatic cholera in man. It is the unanimous opinion that these diseases are transmitted through drinking water. It is spread by a specific germ, or bacillus, in many ways, to-wit:

Pigs purchased from infected herds, or by coming in contact with pigs from infected herds, or by running over ground occupied by diseased swine within one year previous. There are frequently cases where animals of an infected herd will live several months after the disease has apparently entirely subsided, without a sign of it, when they will suddenly die.

Infected streams may communicate the disease to herds below the source of infection. Experiments have shown that hog cholera germs (bacilli) will live and retain their virus four months in water. This would be ample time to infect every herd having access to streams below the source of infection.

The virus may be carried in feed, implements, and on the feet and clothing of persons from infected herds and premises.

Hog Cholera.

The cholera germs retain their vitality from two to four and six months in the soil. They are not destroyed by drying. Hence, a person walking over infected ground may carry away the dried germs on his shoes and clothing to a neighboring herd. Animals feeding upon the carcass of dead cholera hogs will convey the disease germ wherever they go. The spread of the disease has been traced to sheep, dogs, rats and mice, the latter especially.

Pigs become infected by feeding on the discharges and urine of sick hogs, and the carcasses of dead hogs.

HOW TO PREVENT THE DISEASE.

1. So soon as a herd becomes infected, the healthy animals should be immediately removed from the sick so far away there will be no danger from infection by contact, drainage of the soil, water, or gusts of wind. They should be given ample space, so that if there are diseased animals among them, it will not spread so rapidly as when they are crowded. The bodies of those removed may be disinfected by pouring over them a two per cent solution of carbolic acid, or two and one-half ounces of acid to one gallon of water, and also driving them through the solution to disinfect their feet.

2. Destroy all diseased animals. As there is no reliable means of treatment or cure, destruction is the simplest and most economical in the end. A single diseased animal will soon infect a herd.

3. Each dead body should be buried so deep no animal can get at it. It should be covered with a layer of slaked lime several inches thick. If burned, care should be taken that parts not burned are buried as above. The sale, and carrying of such dead bodies to rendering establishments, is prohibited by law, and is a most prolific means for spreading the disease.

4. There should be frequent and thorough disinfection of the premises, and cleanliness maintained. Slaked lime is a good disinfectant for hog cholera, using one pound of lime to a gallon of water. It may be used as a white-wash on fences and pens, and spread over the soil as a thin layer, and thrown into pools, hog-washes, or wherever water stagnates. A more efficient disinfectant is crude carbolic acid, costing about one dollar per gallon, and an equal quantity of sulphuric acid. The two acids should be carefully mixed in a glass jar or bottle, and poured slowly into water in

Hog Cholera.

a wooden pail, in the proportion of two ounces of the acid mixture to one gallon of water. This should be used with a broom or brush upon wood work, fences, pens, floors, tools, etc., and also dashed over the soil. For shoes and boots, brush them with a mixture of one-fourth ounces of carbolic acid and one-half gallon water. Pails, after use, should be rinsed with water to prevent the acid from destroying the iron hoops.

5. All manure from sick hogs should be disinfected before removal.

6. After a disinfection of premises, no hogs should be allowed thereon for at least four months. Where a few animals are left, that have been exposed, no fresh animal should be added to them for six months. If it is necessary to put fresh animals where the disease has been, as in stock yards, etc., then all prior infected animals should be killed, and the premises previously disinfected as stated.

7. Sick hogs should not be permitted to stray into out-of-the-way places, under buildings, and into fence corners, or under straw stacks, thus scattering the disease, and render disinfection impossible. They should be penned, or closed in a yard, where proper attention can be given them, and other hogs kept from them.

8. Where no disinfection is had, hogs should not be admitted on premises where the disease has prevailed within one year. It is believed that the cholera germs will lose their vitality entirely in one year.

9. All domestic animals, especially sheep, that have been in contact with diseased hogs, should be enclosed away from other animals, and closely watched.

10. No person from a farm or premises where hog cholera does exist, or has existed, should be permitted to come on premises where the disease does not exist, unless previous disinfection is had of his boots and clothing.

11. All birds, wild or tame, should be excluded from infected premises.

After all this trouble, there still remains the danger of a fresh introduction of the disease. It is difficult for one farmer to protect himself, when constantly menaced by his neighbors. Still, it is much easier to keep it away than to eradicate it. It is best, therefore, in those regions where the disease is always more or less present,

to keep the hogs in more limited space, and enclosures of such form and size, that disinfection may be had with less labor and more definite results.

It is confidently believed if these rules be faithfully observed wherever the disease exists, hog cholera can be permanently eradicated from the State.

Though winter freezing will not destroy the germs, there is good reason to believe they will not survive more than a year in any soil. But it is carried and distributed, throughout the year, from places where cases have occurred, and thus the virus is kept alive. Hence the necessity for extensive concerted action among farmers.

Hog cholera germs have never been found in soil or water independent of the disease. Neither have they ever been found except in the body or discharges of diseased hogs, and from these the infection spreads.

STATUTORY PREVENTIVE PROVISIONS.

The Legislature of Iowa has provided partial measures to prevent the spreading of hog cholera.

Chapter 79, Laws of 1889, as amended by Chapter 67, Laws of 1888, says:

SECTION 1. All traffic in swine which have died with the swine plague, or hog cholera, or from other contagious or infectious diseases within the State, is hereby prohibited, and it shall be unlawful for any person to haul in any vehicle or public conveyance, any dead hogs which have died, or are known to be affected with such disease, upon any public road or highway, or upon any enclosure other than that upon which said hogs have died.

SEC. 2. Any person having in his possession swine which have died of the swine plague, hog cholera or other infectious disease, shall within a reasonable time cause the same to be burned or buried to a depth of at least thirty inches, so as to prevent the spread of the disease.

SEC. 3. Any person violating or failing to comply with any provision of this act shall be deemed guilty of a misdemeanor and upon conviction thereof shall be punished by a fine of not less than five dollars, nor more than one hundred dollars, at the discretion of the court. It shall be unlawful for any person negligently or willfully to allow his hogs, or those under his control, infected with hog cholera or other plague or contagious disease, to escape his control or run at large.

The rules and regulations of the State Veterinary Surgeon and State Board of Health, approved by the governor and executive council, for the restriction and prevention of contagious diseases

among domestic animals, provides that the carcasses of all animals that have died from anthrax shall, without removal of the hide, or any part of said carcass, be burned or buried not less than four feet deep, and thoroughly covered with kerosene before covering with earth. This tends to destroy the virus, and prevents carniverous animals disturbing the carcass and spreading the disease. Though anthrax is a disease of cattle, and caused by a specific germ, the same rule applies with equal force with the carcasses of hogs, which have died from cholera.

The Code, section 4041, says:

If any person throw, or cause to be thrown, any dead animal into any river, well, spring, cistern, reservoir, stream or pond, he shall be punished by imprisonment in the county jail not less than ten nor more than thirty days, or by fine not less than five nor more than one hundred dollars.

The act of the legislature providing for a State Veterinary Surgeon, and defining his duties relating to diseases of domestic animals, is given here for the benefit of farmers:

SECTION 1. Provides for the appointment by the governor.

SEC. 2. He shall have general supervision of all contagious and infectious diseases among domestic animals within, or that may be in transit through, the State, and he is empowered to establish quarantine against animals thus diseased, or that have been exposed to others thus diseased, whether within or without the State, and may, with the concurrence of the State Board of Health, make rules and regulations such as he may deem necessary for the prevention, against the spread, and for the suppression of said disease or diseases, which rules and regulations, after the concurrence of the governor and executive council, shall be published and enforced, and in doing said things, or any of them, he shall have power to call on any one or more peace officers whose duty it shall be to give him all assistance in their power.

SEC. 3. Any person who willfully hinders, obstructs or resists said veterinary surgeon or his assistants, or any peace officer acting under him or them, when engaged in the duties or exercising the powers herein conferred, shall be guilty of a misdemeanor and punished accordingly.

SEC. 4. Provides for an annual report of the State Veterinary Surgeon.

SEC. 5. Whenever the majority of any board of supervisors, city council, trustees of an incorporated town, or township trustees, whether in session or not, shall in writing notify the governor of the prevalence of, or probable danger from any of said diseases, he shall notify the State Veterinary Surgeon, who shall at once repair to the place designated in said notice and take such action as the exigencies may demand, and the governor

may, in case of emergency, appoint a substitute or assistants with equal powers and compensation.

SEC. 6. Whenever, in the opinion of the State Veterinary Surgeon, the public safety demands the destruction of any stock under the provisions of this act, he shall, unless the owner, or owners, consent to such destruction, notify the governor, who may appoint two competent veterinary surgeons as advisors, and no stock shall be destroyed, except upon the written order of the State Veterinary Surgeon, countersigned by them, and approved by the governor, and the owners of all stock destroyed under the provisions of this act, except as hereinafter provided, shall be entitled to receive a reasonable compensation therefor, but not more than its actual value in its condition when condemned, which shall be ascertained and fixed by the State Veterinary Surgeon, and the nearest justice of the peace, who, if unable to agree, shall jointly select another justice of the peace as umpire, and their judgment shall be final, when the value of the stock does not exceed one hundred dollars, but in all other cases either party shall have the right to appeal to the circuit court, but such appeal shall not delay the destruction of the diseased animals. The State Veterinary Surgeon shall, as soon thereafter as may be, file his written report thereof, with the governor, who shall, if found correct, endorse his finding thereon, whereupon the auditor of the State shall issue his warrant therefor upon the treasurer of State, who shall pay the same out of any moneys at his disposal, under the provisions of this act; *provided*, that no compensation shall be allowed for any stock destroyed while in transit through or across the State, and that the word stock, as herein used, shall be held to include only neat cattle and horses.

Sections 7 and 8 provide an appropriation for expenses of the State Veterinary Surgeon.

SEC. 9. Any person, except the veterinary surgeons, called upon under the provisions of this act, shall be allowed, and receive two dollars per day while actually employed.

Approved April 14, 1884.

POLLUTION OF RIVERS AND LAKES.

Early in the year 1889, serious complaints were made by citizens living along the banks of Iowa River of the pollution of that stream by refuse from a glucose factory at Marshalltown.

A visit was made to Tama, in the middle of May to examine the condition of the Iowa river there. At various points the opportunity was had of securing the testimony of quite a number of

reliable persons, whose occupation and residence, close to the river, made them very competent witnesses. It was learned that at different points along the Iowa river, at Quarry, Montour, Tama and Chelsea in the Fall and Winter of 1887, the water of the river began to smell terribly—that when the ice was cut the odor arising from the water was stifling, that cattle drank it only when compelled by the greatest thirst; that in the Spring of 1888, when the ice went out, the river and ponds supplied with it, were full of dead fish; that from the reservoir at Tama, supplied by the Iowa river, wagon loads of dead fish were taken and buried; and that at all the points named, the same conditions existed—the dead fish and the horrible odor. The following Spring the same conditions existed, though not to so marked an extent as in 1887 and in 1888, and as this condition of water and fatality, did not exist above Marshalltown, the people affected below that city, naturally inferred that the trouble was caused by some refuse entering the river at Marshalltown.

The people at Tama City, so far as seen, were universally and and justly indignant at this altered condition of this river, which had been their pride, and at the wholesale death of their fish. The morning was very unfavorable, as it was raining very hard—it being only a day or two before the rise in the river—the rise being above five feet.

First visited the reservoir, which is supplied, by a canal two and one-half miles long, from the Iowa river, and which is utilized for a mill power, and the source whence they procured their ice supply. Found the water emitting a very sickening odor, indescribable, but possessing markedly the odor of dead fish, sulphuretted hydrogen, and of the products of fermentation. This was most plainly perceptible where the water washes through the sluice-way, immediately before it strikes the wheel of the mill, as it leaves the reservoir. There was seen several dead fish in various stages of decomposition. Mr. Hall who has charge of the reservoir, the water supply of the mill, said that some time previously the dead fish passed into this sluiceway and under the wheel in such numbers as to obstruct the wheel and prevent its revolving. Next was examined the water at a point called "guard locks," a half mile or so below where it enters into the canal from the river. Here were found a large number of dead and dying fish. The sick fish were swimming about (principally bull-heads) with their noses out of

water. Here, also, mussels that had died, became detached from their shells, and were floating on the water. Here, also, was the same sickening odor. The water here, as well as lower down in the reservoir, was laden with a slimy product that was attached to stones, twigs, dead fish—gelatinous in appearance and feel.

The greatest stench, and the largest number, and greatest variety of dead fish were found at the dam, at the point where the water enters this canal before referred to. Here, both above and below the dam, circling in the eddies, and lodged against the brush, were fish of various sizes, and in all stages of decomposition, and a nauseating smell. There were large numbers of dead crawfish upon the sand banks, and sick fish swimming about in the eddies. Even in the swiftest places, as the water ran over the dam, there were long festoons of a semi-transparent gelatinous character, attached to rocks, logs, and twigs. It was thought to be gluten from the starch works, or rather, glucose works at Marshalltown. Samples of water for chemical and microscopic examination, at five different points in the reservoir, canal, and river above and below the dam, were obtained.

As showing the irritating quality of the water, three or four days previous a party of young folks were below the dam referred to. Three of them who drank of the water became very sick with vomiting and diarrhœa. The Indians living on their reservation, and farming the land lying along the river and between the river and the canal, claim to have lost an unusual number of their ponies, and attribute it to drinking the water of the river. Farmers along the river also said that their cows, when driven by thirst to drink the water, showed a marked tendency to "drop" their calves.

On return to Des Moines the facts were laid before Governor Larrabee who kindly requested Hon. E. D. Carlton, State Fish Commissioner, to go to Marshalltown to further investigate the matter. A meeting was arranged for one week from the time of the Tama visit. In the meantime heavy rains had fallen and the Iowa river had risen, as previously stated, five feet. This doubtless very favorably modified the condition of the water.

A little stream called Linn creek runs towards the east on the south side of the railroads. This creek is a tortuous, sluggish stream with but little water, and during the last two or three years owing to the

light rain fall almost dried up. It is made the receptacle for two sewers carrying about three-fourths of the sewerage of the city, the refuse from the glucose works, the canning factory, and the packing houses, and after winding about two or three miles, empties into the Iowa river.

Wednesday, May 22d, at Marshalltown, with Mr. Carlton, Mr. Ames, mayor; Dr. Kibby, chairman of the health committee of the local board of health for that city, and Mr. Carney attorney for the glucose works, a visit was made to this creek at the points where the upper sewer, the glucose refuse, the discharges from the feed stables and the lower sewer enter this creek, and supplies of the water for examination were obtained.

We then went to the river at a bridge, one-half mile above the mouth of Linn creek, and rowed down the river. The water was clear and free from bad odor, and some parties were fishing under the bridge. So soon as we came opposite the entrance of Linn creek we detected it by the foul odor—a strong sour-mash smell. We went into the mouth of the creek. The banks were lined with a thick deposit of corn bran and gluten which was in active fermentation, and giving off, not only there, but at all points along the river as far as we went, gases, and a very disagreeable odor. We saw no dead fish. We saw at several points where some parties had been fishing, some indications of fish, but did not, however, actually see a fish or a frog, large or small, along the river. We did see some turtles on some logs. All along, so far as we went, we found the same gelatinous masses attached to twigs, logs, the banks in mid stream and on shore, as we had found in the river at Tama city; and it seemed to increase in quantity as we went down the river. There was no appearance of it in the river above the point where Linn creek empties in its contents. We obtained some water at the mouth of this creek, and also at the lowest point we went down the river, which was about five miles below Marshalltown, at what is known as the Main street bridge over the Iowa river. Here we also obtained a bottle of this gelatinous substance for examination. The bottle containing the tenacious, ropy substance so abundant at Tama and at other points below Linn creek, was brought to this office.

Owing to the illness of Prof. Davis, chemist of the Board, no chemical analysis of the samples was made. A sample was sent to

Prof. McBride of the botany department at the Iowa State University, who says: "The Beggiatoa present appears to be the *Beggiatoa alba*. This species is found in filthy water—water which comes in the over-flow from factories, and in warm sulphurous springs." * * * * "As to the fish, I am of the opinion that the supply of oxygen in the water, under the circumstances, is inadequate to support animal life. Beggiatoa being *chlorophyless*, is a consumer of oxygen, and an exhaler of carbonic acid, therefore, a rival of the fish for the small amount of oxygen contained in the water, and as the result shows, seems a successful rival."

Specimens were also sent to Prof. Pammel, bacteriologist at the Agricultural College, Ames, and were examined by him microscopically. He says: "The greyish or blackish gelatinous masses contain great numbers of one of the largest of the bacteria, Beggiatoa *alba*, which as is well-known, occurs in sulphur springs; in the waters that flow from manufacturing establishments, such as tanneries and sugar works, and at times causing the destruction of life by the evolution of poisonous gases." * * * This gas (sulphuretted hydrogen) may have an injurious effect on the animals inhabiting it when in sufficient quantity. In Europe a bay is known which has received the appellation of "Dead Ground," because it is avoided by fish, but not by all animals. It is formed by a species of Beggiatoa.

This same bacteria, Beggiatoa *alba* in good abundance was found in the Des Moines river, below the entrance of the sewers, from the starch factories, at Des Moines. There is none in the Des Moines river *above* this point. So the conclusion is, that the starch refuse is responsible. It is, perhaps, known to few, that in the manufacture of glucose, the corn is first converted into starch by the same processes that are used in the regular starch-making establishments.

Within the last few years, the large wooden tanks, holding hundreds of bushels of corn, in which the corn is soaked, are disinfected by fumes of sulphur, instead of by white-washing with lime as formerly. The sulphur is burned outside the building in a special furnace, and the fumes are conducted by pipes within these tanks, and are allowed to remain in contact with all parts of the tank until they are thoroughly disinfected. Then they are washed out. This water used in washing out these tanks—heavily charged with

sulphur—goes into the general waste, and is thrown into the sewer, and thence carried into the streams. This is probably the source of the beggiatoa, and the fish are killed by these bacteria, as stated by Prof. McBride, by consuming too much of the limited amount of oxygen in the water; by the production of poisonous gases as stated by Prof. Pammel; and also mechanically, by this tenacious product becoming entangled in the "gills"—the respiratory organs—of the fish.

A letter from the Hon. S. P. Bartlett, Secretary of the Illinois Fish Commission, to Hon. E. D. Carlton, our State Commissioner, dated June 1st, says: "We have lately had a great mortality among the fish on Fox river, below St. Charles, at which place there is a large glucose works."

Dr. J. H. Ranch, Secretary of the Illinois State Board of Health, in a letter to this office, dated May 29th, says: "There are no fish for a short distance below Peoria, in the Illinois river."

Prof. G. E. Patrick, chemist, of the Iowa Agricultural Experiment Station, Ames, in a letter to Prof. Pammel, after examining chemically the Des Moines river water obtained below the Des starch works, after speaking of the very large amount of organic matter in the water, and the quantity of sulphuretted hydrogen which he found to be ".0082 grains per liter of the water," says: "This amount seems but slight, yet viewed from the standpoint of the air breathing inhabitants of the water, it is very large. * * In the absence of direct experimental evidence, it seems altogether probable that the amount of hydrogen sulphide (sulphuretted hydrogen) found in this water, would be fatal to fishes even if the putrescent organic matter were not."

Hon. E. D. Carlton, after visiting the Iowa river at Marshalltown, went to Tama City and made a personal examination of the river there. He says: "We found only a few specimens of fish, and all were in such an advanced stage of putrefaction that it was useless to search for evidence of the cause of death. We were unable to find any patches of the gelatinous substance, such as we obtained at the Main street bridge in Marshalltown, but I was informed that it was to be found all along the river prior to the freshet. That the death of so many fish was caused by the impurities in the water is, I think, an unquestionable fact."

Pollution of Rivers and Lakes.

The matter was presented to the attorney general, and his opinion requested as to the powers of local boards in the premises. His opinion will be found in another place in this report.

Upon the receipt of this decision the following communication was sent to the Mayor of the city of Marshalltown:

OFFICE OF THE STATE BOARD OF HEALTH,
DES MOINES, IOWA, Aug. 12, 1889.

Hon. Mayor Ames, Marshalltown:

DEAR SIR.—As secretary, and in behalf of the State Board of Health, I have the honor herewith to officially call your attention to the condition of the water of the Iowa river, as seen and demonstrated by myself; and as attested by between one and two hundred affidavits, on file in this office; and by numerous letters not sworn to. As a result of these personal observations, and the other evidence referred to, there is no question but that for fifty or sixty miles below Marshalltown, the water of the Iowa River is polluted to such an extent as to render it destructive to fish and other animal life within it; and injurious, and often fatal to animals drinking it. The water when frozen, is unfit for use as ice; and all along the river for miles, the stench arising from the water is a source of great annoyance, if not of positive danger. I am sure this condition cannot exist very long without the public health being greatly endangered thereby.

The important questions remaining are: "What produces this terrible condition?" and "How can it be remedied?"

After very careful and diligent investigations made at Tama City, and later at Marshalltown, the latter investigation including topography of your city along Linn Creek; the out-puts of your sewers into this stream; the glucose works, and the methods of disposal of their waste products, as well as the cattle sheds connected therewith; the condition of Linn Creek at various other points, and especially where it empties into the Iowa river; the Iowa river itself for a half mile above where it receives Linn Creek, and for three or four miles below the mouth of this creek; and the subsequent chemical and microscopic examination of the water, and especially of the tenacious, glutinous masses so abundantly adherent everywhere: I say after all these investigations, I can arrive at no other conclusion than that the defilement comes from Linn Creek, and that so far as the death of the fish is concerned, and the production of the bacteria—the Beggiatoa *alba*—the glucose works are in the main, if not wholly responsible. The offensive odor is, or has been largely in consequence of the dead and decomposing fish, mussels, etc., and by the gases arising from the fermentation of the glucose waste, or more correctly, starch waste, together with the discharges from the cattle sheds.

It may not be amiss to state here, that subsequent to my personal inspection at your city, Mr. Carney and Mr. Smith, the superintendent of your glucose works, came to this city, and together we visited the Des Moines river at the point where it receives the waste of our starch works, and for a short

Pollution of Rivers and Lakes.

distance below. We found here the same glutinous substance adherent everywhere in the stream, and fish were being caught—"suckers" and "bullheads." An examination of this tenacious mass showed it to be identical with that found in the Iowa river. Later investigation proved that this does not extend to any great distance down the river, nor does it extend across the river. This is doubtless owing to the fact that the amount of waste contributed by the Des Moines works, conjointly, is not nearly equal that of Marshalltown; and the Des Moines and Raccoon rivers at this point furnish a much larger supply of water, and a much swifter current; and the further fact, that in ten minutes or fifteen at most, after leaving the Des Moines works, the product is at the river.

Above the point where this starch product enters the Des Moines river, even with all the sewage of the city of Des Moines and its suburbs, as well as the refuse from the packing establishments, the water does not contain this glutinous substance, and has no foul odor.

In view, therefore, of above facts, and the further fact of the very large amount of refuse thrown into Linn Creek, the very small amount of water it contains; its sluggishness and tortuousness; the long distance before it empties into the river; and the large amount of corn shells (bran), gluten and stable manure, that drops to the bottom of the stream during its course and ferments—thus giving rise to offensive and noxious odors;—in view of these further facts, I am firmly convinced that your glucose works are wholly responsible, and that under present conditions, an increase of their capacity, and the number of cattle fed, would only incresae the trouble.

The means for the removal and prevention in the future of the contamination of this stream, can only be suggested in outline by me, leaving the details with you, and with the Glucose Company, who are directly interested, and apparently diligently seeking the best methods of carrying on their business with as little annoyance as possible. I would suggest:

1. That Linn Creek be not made the receptacle of any of your sewage, or the refuse from any of your manufactures. If it carries off the surface washings in time of heavy rains or melting snow, it is all that should be required of it. As an open sewer and conduit, as it is now used, it is a miserable and dangerous failure, and always will be. Statistics in this office show that while in 1884 and 1885 there were only two deaths from diphtheria in your county for each year, in 1886 there were nineteen (19), and in 1887 thirty-seven (37)! Nearly all these deaths occurred in our city notwithstanding the most excellent quarantine regulations you have, wholly unnecessary, with the cause of infection removed, and which has entailed upon your community a property loss in this thirty-seven human lives that may justifiably estimated to be:

37 lives at $1,275 each	$29,225.
Burial expenses at $50.00 each	1,850.
Medical attendance, nursing, medicine disinfection, etc., at $100	3,750.
	$34,825.

You have an example of municipal economy conspicuous only for its folly.

2. A closed sewer running north and east, not too large to flush readily, and insure a rapid flow through it, should be built from the mouth of your western sewer on the south side of your city, to the Iowa river, by the shortest and most direct practical route. This should receive all your sewage (but no storm or surface water), and the liquid refuse from all your factories which are fortunately so situated as to make it very practical.

3. The water used in washing the large tanks where the corn is soaked, in the glucose works, and containing large proportion of sulphur, should be run off by a different system into one (or more) large settling basins whose bottom is a gravel or sand bed. This should have no outlet further than the percolation through the sand.

The water used in soaking the corn, and all other water from these works, might enter the city sewer proposed above.

4. The glucose works should be required to double, at least, if possible, their facilities for evaporating, and thereby preserving the valuable food products that now too largely find their way into the waste, and thus add greatly to the contamination of the water. The means for doing this will suggest themselves readily to the operators, and the saving thereby ought to pay the cost of additional machinery.

To do this, (reduce so far as possible by separation and evaporation) all the food products—the organic matter—in the refuse, would greatly lessen the necessity for feeding so many cattle, and would thereby remove the filthiest, if not the least profitable of all their departments. Cattle kept and fed, as they are at such places, amid filth, and deprived of grass and solid grain, cannot be healthy, and cannot afford wholesome meat. How much better it would be if such cattle could be pastured, have fresh running water when they are thirsty, and eat the dried product rather than the steaming swill.

5. The manure and refuse hay from these feed stables, should not be allowed to enter the sewer but should be piled up, have the liquid drained off, and be hauled to a point where it could be taken away for fertilizing purposes. What would be better still, would be to abolish the cattle sheds and cattle feeding altogether. The expense of a sewer, such as is suggested, should not be very great, and should be borne in part by the different industries benefitted by it. I cannot let this opportunity pass without entering an emphatic disapproval of our whole method of disposing of the sewage and refuse from our cities by turning it into our streams. Cremation, evaporation, irrigation and chemical transformation suggest possibilities that in the near future may greatly aid in the solution of this question. The plans suggested above are, all things considered, I believe the most practical for your city, and perhaps will contribute least to the befoulment of your river.

I send you herewith a late opinion of the Attorney-General upon this case showing conclusively that with your board of health rests exclusively the duty of requiring all industrial enterprises within your city to be conducted in such a way as not to become a public nuisance and a menance to the public health; and to provide such disposition of your sewage as shall give least offense, and contribute most to the sanitary welfare of your people.

I am, Mayor, Very Respectfully,

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

Subsequently, an action was commenced in the district court of Tama county against the Glucose Company, and judgment was rendered against it. The company appealed to the supreme court and that court affirmed the judgment of the court below, and thus determined the right of any person to pollute the rivers and public waters of this State.

Iowa is comparatively a new State. No great cities are embosomed upon the shores of her inland waterways, nor upon her beautiful lake-sides. Still, she is old enough to have these rivers and lakes become the receptacles of more than a score of sewered cities. Hence, it is high time to seriously consider a problem whose early and rational solution will save millions of dollars to the people of the State and contribute vastly to the health and happiness of our people. It is useless to assert that percolation, oxidation, sedimentation or extreme dilution will remove or render harmless disease germs which have gained access to our water supply. The River's Pollution Commission of Great Britain, after months and months of the most careful and painstaking investigation says:

Of all the processes which have been proposed for the purification of water, or of water polluted by excrementitious matter, there is not one which is sufficiently effective to warrant the use, for dietetic purposes, of water which has been so contaminated. In our own opinion, therefore, rivers which have received sewage, even if that sewage has been purified before its discharge, are not safe sources of potable water.

Dr. Charles Smart, Surgeon U. S. Army, and chairman of a committe appointed by the American Public Health Association on the "Pollution of Water Supplies," at its annual meeting held in Milwaukee, Wisconsin, reported as follows:

* * * A water to which sewage has access, should, from that fact alone, be excluded from all further consideration as a possible water-supply for drinking purposes.

The introduction of a water supply into a growing city is ordinarily only a question of money. Engineering difficulties fade into insignificance when surveyed from a satisfactory financial standpoint. It is often said to be

beyond the power of money to purchase health, but the sanitary student can readily demonstrate that in many cases this is not so. Money expended in the distribution of a wholesome water-supply will purchase health for the thousands who otherwise fall victims to the fever which is endemic in our cities and towns. Typhoid fever is a disease to which every one is exposed. The susceptibility to it is inherent in our constitutions, and, so far as we know, immunity can be purchased only by submitting to attack. Ordinarily the human constitution succumbs to its influence before maturity is reached, but if, up to that period, we fortunately escape, we have no assurance of future immunity. Uncertainty overhangs us like a cloud. Danger is as present with us in the daily routine of our peaceful lives as on the battle-field, only that the embodiment of evil is an invisible and intangible germ instead of a fast flying bullet. Danger flows beside us in our streams, in our mains, from the taps in our houses. The germ of the disease may not be in this pitcherful or in that, in this tumblerful or in that, but it will find us some day if we continue to use the water which contains it. In a town of 50,000 inhabitants one victim is taken daily, and as the average duration of this disease is about a month, there are always in that city thirty persons whose lives are unnecessarily trembling in the balance.

What is the local suffering from yellow fever in Jacksonville, Pensacola or New Orleans, once in so many years, compared with the totality of the destruction caused by the steady progress of this general and ever-present scourge? Thirty thousand people die of typhoid fever annually in the United States of America, and Vienna lowered her losses by this fever from 340 to 11 annually in every 100,000 of her population by introducing a spring-water supply instead of the sewage-tainted waters of the Danube. Calculate the loss by sickness associated with those 30,000 deaths—the loss of work, the unprofitable work of nursing and the actual outlay necessitated by each visitation of the disease—and you will find that saving money by drinking sewage in the water supply is a penny-wise policy that in the long run will fail to pay even for the funerals and the mourning goods.

Massachusetts, Michigan and Illinois have each made liberal appropriations for the examination, by analysis and microscope, of their water supplies, and the results of these investigations are highly interesting and instructive. Iowa need not wait such investigation. Dr. Smart says that the water of any of our lakes, rivers or wells that become the receptacle of sewage is not safe for potable purposes, unless previously boiled. Hence, it is clearly the duty of our people to avoid in the future, the pollution of our water supplies, and to procure our water from uncontaminated sources.

Quite appropos to the foregoing, is a communication from Dr. J. F. Sanborn, of Tabor, to the State Board of Health, in which, after giving a very interesting description of the chemical changes

occurring in the manufacture of starch from corn, and of glucose from starch, and the cause of its pollution of the water receiving the refuse from these works, and of its destruction of animal life in water so polluted, he considers the use of glucose and its dangers, and his conclusions are commended to the reader. He says:

If this refuse is so deadly to the fish in the river, how is it with the glucose? It is a well known physiological fact that matter to form any of the tissues of the animal body must be organic in its character; that is, the substance must be as it was produced by the forces of nature in its growth, and on a higher plane than can be produced by chemical force; and if so, then so soon as the molecules of organic matter become reduced to the realm of chemicism it has lost all life giving properties. This is the condition of glucose as made from starch. Sugar, as found in sweet apples and other fruit and vegetable product, has nourishing properties, for it is produced in the normal direction of the development of matter as it passes from crude matter toward the highest plane of organic matter as a vegetable product, and for a specific purpose, and is especially adapted for the formation of adipose tissues of animal life, and as such is duly digested and absorbed into the circulation. It passes the liver for further modification, the better to fit it for assimilation without congestion to that organ. It all the way along has been associated with life and vital operations, and for a life-giving, built up object, and when normal tissue is formed from it, then it subserves life's end as such living tissue, and when it is broken down, it is eliminated by the kidneys—not as sugar, nor as glucose; not as fat, nor any other tissue, but as broken down matter. The function of the kidneys is to remove all broken down matter of the system that is soluble in water. As they are especially adapted for this duty, they normally perform it without any abnormal wear and tear. This is a physiological action, a health sustaining process essential to health and life. This certainly is not the case with glucose. It is not identical with sugar as found in fruit and vegetables, though it may be chemically isomeric with grape sugar. It is made by a chemical and not a vital process, and all the life sustaining properties, as found in the corn, or the proximate principles, as starch, when put through the necessary process for the change of starch to glucose, have destroyed all the life principles, and the result is dead matter, bearing no more relationship to the wants of vitality than so much inorganic matter; and when introduced into the vital domain, is as destructive to the vital organs as stovewood would be to a machine designated to clean grain; and is it any wonder that the liver and lungs do not fit it for the build-up of the tissues of the body? It being dead matter, it is refused assimilation, and is ejected by the kidney—not in the form of broken-down tissues of the body, but as glucose. The kidneys were not designated for any such purpose, and if forced to do it, soon become used up, as the threshing machine would be if forced to make "excelsior" of stove wood, instead of performing its normal duty on a well regulated farm.

Albumenuria and diabetes mellitus are the result as a rule of this unphysiological habit. While the refuse of the glucose factory is so destructive to the fish of the Iowa river, and to the health of the animals that drink the water; and while the pestilential emanations disturb the comfort and happiness of the people, so as to require the attention of your honorable board, would it not be well for you to investigate the deadly influence of glucose itself? The distillery and breweries have had to close their works because their products were so destructive to the health and good morals of the people of the State. Why not now, as a Board of Health, look to the interests of the people and their good health by studying the diseases caused by glucose, all over the State, while you investigate the cause of the death of a few tons of fish in and about a small locality like that of Tama City?

WATER SUPPLY FOR SMALL TOWNS.

The adoption of a public water supply for small towns is specially commended. It is practical and most conducive to public health. It is vastly easier to guard against impurities in one general water supply than countless wells. Most of the wells in Iowa are shallow, receiving their supply from surface drainage. Very few contain pure, or healthful water.

The question of cost is, however, the one that frightens most cities and towns. Scarcely any town is so situated in Iowa but can have a pure, and healthful water supply if the people are only able, or rather willing, to incur the expense. Hence, it mostly resolves itself into a question of dollars and cents. The following, from *Fire and Water*, gives an estimate of the cost of a water system for Humboldt, Iowa. If the cost were $15,000, instead of that given, it could be well afforded:

"It is remarkable how many of the smaller communities are now enjoying pure and abundant water. From published statistics we find that over one-half of the water works of the New England States have been constructed within the past seven and one-half years. Seventy-six works, or twenty-seven per cent, have been constructed within two and one-half years. These new works supply a much smaller average population than the earlier ones,

which were designed for large cities only. Statistics also show that a very large part of the population has likewise only been supplied within the last few years. In the Western States it seems as if everything, almost, in the way of water works, had been done since 1880.

The quantity to be supplied varies *per capita* from twenty to forty gallons for towns of from one thousand to five thousand inhabitants for domestic use. For fire purposes, an additional capacity of pumping or storage of from one hundred and seventy-five thousand to three hundred and fifty thousand gallons daily, should be secured. Domestic supply may be from a limited source, while for fire purposes, connection can be made from a less pure source, such as a stream or a river adjoining.

Proceeding to the subject of pumping: The power used is generally steam, air and water not being reliable where an increased power may be suddenly required. The capacity of pumping engines should not be less, as a rule, than five hundred thousand gallons daily. The boiler and engine capacity should be greater than actually needed for present and immediate future — it is economy in wear and fuel. The mains should also be larger than may seem needful at the moment, for experience has shown great loss in cases of fire, due to the small mains being insufficient to furnish an adequate quantity of water.

The cost of water-works for small towns and cities in Iowa ranges from $9,750 to $32,500. With the growth of these towns the revenue can be made to pay a fair dividend on the investment.

The town of Humboldt, Iowa, has a population of about one thousand, and is located on rolling ground on the east bank of the Des Moines river, with bluffs on the west. The committee on water supply, had determined, if practicable, to secure the supply from one or more of the springs in and along the banks of the river. The analysis showed the water to be comparatively pure, and it only remained to determine by surveys the most practical method of utilizing them.

The Avery and Ricard Springs were selected, the former discharging one hundred and ten gallons, and the latter approximating forty gallons per minute. It is proposed to wall up and cover these springs, and convey the flow from the Avery to the Ricard Spring, and thence the combined flow to the pump well. This well

is sunk to a depth of two feet below the water in the river, with which it is connected for use, if ever found necessary, for direct pumping in case of fire. The quantity which it is estimated would be required for domestic use was fixed at thirty thousand gallons per day, with an additional allowance of twenty-five thousand gallons daily, probably to be used by the railroad company. To afford pressure, and, for the present, a sufficient storage, so as not to require constant pumping, and to avoid possible failure of supply in case of machinery breakage, the construction of a reservoir with a capacity of three hundred and fifty thousand gallons was thought advisable, as it could be readily constructed and without great expense. This reservoir, when full, will afford storage for five days' supply for some years. The pumping engine is to have a capacity of five hundred thousand gallons daily.

In case the ordinary pressure of twenty-six to thirty pounds is insufficient for the purposes, direct pumping into the mains can be resorted to. This, however, at present is not anticipated as being necessary. The pumping station and mains are to be designed for the future growth of the city, and no changes in the proposed plans are anticipated as necessary, except the addition of an elevated tank, or stand-pipe, to insure a greater pressure.

Following is the estimated cost of the proposed works:

Engine and boiler house	$ 1,000.00
Pumping plant	2,150.00
Mains and valves	2,250,00
Hydrants	350.00
Trenching and laying pipe	2,250.00
Reservoir	1,025.00
Conduit, pump well and spring protection	850.00
Engineering and contingencies, ten per cent	1,097.22
Total	$ 10,972.22

RAILROADS.

The railroad link-and-pin car-coupler is still with us to maim and mangle bodies and limbs, but it is gratifying to know that it is going, and will ere long become extinct. The tenacity with which it holds its place is evidence of the vastness of the railroad system of this country, traversing into and through every State in the Union. Legislation and inventive genius have furnished a remedy for this great evil. The adoption of an automatic coupler on any of the trunk line roads involves an expense of millions of dollars. The great problem has been, and now is, to find some appliance that would be practical, durable, and reliable, and that could be universally adopted, thus securing uniformity on all roads, so that cars could be run from one extreme of the country to the other. The problem is rapidly being solved. The Railroad Master Car Builder's Association has agreed upon a type of automatic coupler, that may be used, and which will entirely supersede the link-and-pin coupler.

Under the statutes now in force in this State, all new cars put on, and all old cars sent to the shop for general repairs, or where new draw-bars have to be put in, the car must be equipped with safety or automatic couplers, and after January 1, 1895, all cars used in Iowa must be so equipped. After January 1, 1892, all locomotives used in Iowa, must be equipped with power brakes, and after January 1, 1893, all trains operated within the State must have a sufficient number of cars equipped with automatic, or power brakes to enable the engineer to control the train from the locomotive. The railroad lines reporting to the Iowa Railroad Commissioners reported two thousand four hundred and forty-four locomotives equipped with train brakes, six thousand six hundred and fifty-eight cars equipped with train brakes, and five thousand, five hundred and fifty-seven cars equipped with automatic couplers, in 1890. During the year 1891 it is believed greater progress will be shown.

Railroads.

It will be seen by the report of the railroad commissioners for the year ending June 30, 1890, that there is an increase in the number of killed and injured, from coupling cars. For the previous year there were killed eight, injured, one hundred and forty-nine. In this report for 1889, the Chicago, Burlington & Quincy system is not included. The following are the casualties for the years named:

	1889.		1890.	
	Killed.	Injured.	Killed.	Injured.
Employes	35	442	73	579
Passengers	4	25	9	67
Others	33	46	69	101
Total	72	513	151	747
Coupling cars	8	149	14	203
Falling from cars and engines	5	44	17	83
Overhead obstructions	....	....	4	4
Collisions	3	21	15	55
Derailments	3	16	5	42
Other train accidents	7	30	13	28
At stations	11	18	17	36
At highway crossings	8	7	14	23
other causes	18	229	51	303
Total	72	513	151	747

The increase of accidents to employés indicates that the increase of automatic couplers has not yet reached a protective point—in fact, it is probably true that they have increased the danger from their mixed contact with the common link-and-pin drawhead.

For the year 1889, there was carried thirty million, fifty-six thousand, one hundred and eighty-six passengers. For the year 1890, there were carried five million, nine hundred and fifty-five thousand, eight hundred and fifty passengers, or twenty-four million, one hundred thousand, three hundred and thirty-four less than in 1889, yet the above table shows the number of passengers killed was more than fifty greater than in 1889, and the same increase is shown in the total killed.

The large increase of persons killed and injured while walking on the track evidences conclusively the imperative need of legislation not only to protect life, but for the benefit of railroad companies. Severe penalties should be provided for such trespass, to impress upon the public mind the great danger. During a period of thirteen years three hundred and sixty persons have been killed, and

Railroads.

three hundred and nine injured, while walking on the track. This is a costly tribute to pay for the convenience of using the right-of-way of the railroad companies. It ought to be prohibited. It is prohibited in England, and the prohibition is enforced.

From these statistics it will be seen that since 1878, five hundred and forty-one persons have been killed by clearly preventible means, and within legislative control. This is a serious loss to the industrial wealth of the State. Add to this the consequent expense of medical attendance, and burial, and we have

541 persons at $5,000 each	$ 2,705,000
Medical attendance, care, etc., at $50	27,050
Burial expenses, at $50	27,050
Total loss	$ 2,759,100

Such a loss as this is certainly full warrant for such measures as will reduce it to the minimum, so far as is within human possibilities.

It is an evidence of the progress of sanitation that there exists a National Association of Railway Surgeons, and that at their last meeting they discussed the ventilation, heating and sanitary cleaning of cars. There was no difference of opinion as to the importance and necessity for reform in these matters. Every person who travels upon a railway train is conscious of that. The question was, how best to secure it.

During the discussion Dr. R. Harvey Reed, of Mansfield, Ohio, said: "Less than four years ago, I made an inspection of the cars on four different roads. I made, or had made, an analysis of the air. I inspected the closets, urinals, wash-stands, water-tanks and the various departments of the car. I found a baby's diaper in a drinking water tank. In this case the water-tank was placed inside the water-closet, and somebody had gone in there and thrown the article into the drinking tank. That form of water-tank has been removed on that road. Some of the roads fill their water-tank from the top of the car. I dare say some of these tanks have not been cleaned for a year. From ten to thirty minutes is given to change engines at a station. The employé jumps on top of the car, runs water into the tank, throws in three or four chunks of ice, and the train goes. This occurs daily throughout the year. Nobody looks after this matter particularly, consequently it is only rational that

when you inspect these tanks they are found absolutely filthy, notwithstanding the fact that the water is clear, and may be perfectly cold.

Another point. Take the water that is supplied by the different railroads. Not one road out of a hundred has its drinking water analyzed, or knows what kind of water it is giving to its passengers. I found in analyzing some of the waters that they were absolutely unfit for use; other waters were fairly good, and others moderately good. This is the sanitary part of the work of a railroad. Somebody should attend to this matter, and see that the water tanks are clean, and that the water poured into them is fit for use. In the ladies' department I found that about ninety-five per cent of the water-closets were clean; while in the gentlemens' department, if I remember correctly, about thirty-seven or thirty-eight per cent of the water closets were filthy. There is a reason for this, and that is the mode of construction of these water closets. In the ladies' water-closet you are bound to have them clean if properly cared for, as there is no place for dirt to lurk. On the other hand, in the gentlemens' department, there are no means of keeping the urinal clean except you force hot water or steam through it. There are very few of them but have an offensive odor during the summer time. Something should be done to avoid this, as it can easily be accomplished without any additional expense worth mentioning.

The cleaning of cars is of great importance. One has only to watch how hurriedly they clean the cars day in and day out. Take the average class of people who do this; they know nothing about such work from a sanitary standpoint, and care less for it; they do a certain amount of work each day, for which they are paid a stipulated price, which ends their interest or anxiety. Again, there are very few railroads but carry weekly to different parts of the country people sick with contagious diseases. There are a great many physicians who are not conscientious about these matters, and permit such people to impose on the railroads. They allow scarlet fever and diphtheria, or some other contagious or infectious disease, to travel which ought to be quarantined. A case was recently taken from Chicago to Zanesville, where an epidemic of diphtheria broke out. The physician in Chicago either did not make a correct diagnosis, or evaded the facts, and the results were disastrous. Railroads

do not carry these cases intentionally, yet occasionally—almost every month I may say—there is scarcely a railroad but carries some person or persons with contagious diseases, such as measles, scarlet fever, etc., and yet there are no provisions to-day for cleaning these cars and putting them in a condition so that your children and my children can ride in them with safety. There ought to be some rigid restrictions, first in regard to carrying these cases, and second, there should be some method by which the cars could be put and kept in a sanitary condition.

There is one other point, and that is the ventilation of cars. There are several different methods for ventilating cars, yet few of them at the present day are ventilated as they should be. The question in regard to carbonic acid in the car is one of importance. I found by analysis that carbonic acid in Pullman cars was higher than in the smoking car. That may seem strange to you, but it is nevertheless a fact. The Pullman car starts out with a car-load of passengers in New York, and few changes are made from there to Chicago. People ride with the car virtually closed, and the ventilation is poor. The result is, that when you go into the car in the morning, you find fifteen or eighteen parts of carbon dioxide to ten thousand parts of air, whereas there should not be over five. On the other hand, in the smoking car, somebody is constantly going in and coming out, consequently you will only find about five or six parts of carbon dioxide in ten thousand parts in the smoker on the same train.

There should be some system adopted for the ventilation of these cars whereby the bad air can be driven out and fresh air let in. In regard to the temperature, the lowest I found in any car during the cold weather was twenty-two degrees between the mouth and feet, and the highest was thirty degrees. When you get a temperature varying from fifteen to thirty degrees between the feet and the mouth, to say nothing about the variations in the temperature in the car higher up, you can readily understand how liable you are to catch cold. The cars referred to were heated with steam pipes at the floor, yet there was still this difference. In a series of two hundred and twenty-four analyses, made in reference to the amount of carbonic acid at the top and floor of a given room, the results were surprising—in fact there was practically no difference between them; that is, where you have a circulation of air and everything

thing else equal, the carbonic acid is practically the same at the ceiling as at the floor. You must substitute a system of heating and ventilation that will overcome the pressure as you pass though the air. When the car is in motion you have a strong air pressure in front of the car, consequently, when it is standing still, it changes the currents of air inside. If you desire to heat and ventilate cars properly, you must take into consideration all these facts. You have got to produce a current of warm, fresh air that will come in at the floor and exhaust the foul air at the floor, in order to get the car heated and ventilated equally all over. If you do that, there is no necessity of having your windows or transoms open, and you would not have ten degrees difference between your feet and the ceiling of the car; there would be an equal distribution of heat all over the car from one end to the other, and you would not have an increase of carbonic acid over the ordinary amount. There are fifteen millions of people moving on wheels or boats every twenty-four hours in this great country, and considering this fact it is worth our while to pay attention to this subject. It is worth while to endeavor to remedy these defects, and to give better accommodations than are given at present, especially when it can be done without any material additional expense to the railway companies."

TRANSPORTATION OF CORPSES.

With the hearty co-operation of general baggage agents of the various railroad companies, the transportation of corpses is now subject to very satisfactory regulations, uniform over a large number of States. During the past two years practical experience has dictated modifications and changes in the rules, which have been made, the most important of which was the transfer of diphtheria corpses from the permissible to the prohibited. This change was necessitated by the frequent shipment of bodies, especially of children, under a permit giving "heart failure" as the cause of death.

In many instances investigation showed that the term "heart failure" was given as the cause of death in behalf of the friends and

relatives of the deceased in order to secure the transportation. The term "heart failure" is meaningless and signifies nothing. Its use as a cause of death evidences gross ignorance, or deception. Hence as a measure of protection, it was deemed prudent to prohibit the transportation of persons dead from diphtheria, and the use of the term "heart failure," as a cause of death, by physicians.

The following are the rules and regulations now in force.

RULES OF THE IOWA STATE BOARD OF HEALTH, AND NATIONAL ASSOCIATION OF GENERAL BAGGAGE AGENTS,

FOR THE TRANSPORTATION OF THE DEAD.

These Rules having been duly adopted and properly published, have the force of the Law.

RULE 1. The transportation of bodies of persons dead of small pox, diphtheria, Asiatic cholera, leprosy, typhus fever or yellow fever is absolutely forbidden.

RULE 2. The bodies of those who have died of anthrax, scarlet fever, puerperal fever typhoid fever, erysipelas, measles, and other contagious, infectious or communicable diseases, must be wrapped in a sheet thoroughly saturated with a strong solution of bi-chloride of mercury, in the proportion of one ounce of bi-chloride of mercury to a gallon of water; and encased in an air tight zinc, tin, copper or lead (lined) coffin, or in an air tight (iron) casket, hermetically sealed, and all enclosed in a strong, tight wooden box; or the body must be prepared for shipment by being wrapped in a sheet and disinfected by solution of bi-chloride of mercury as above, and placed in a strong coffin or casket, and said coffin or casket encased in a (soldered) zinc, copper or tin case, and all enclosed in a strong outside wooden box of material not less than one inch and a half thick.

RULE 3. In cases of contagious, infectious or communicable diseases, the body must not be accompanied by articles which have been exposed to infection of the disease. And in addition to a permit from a board of health or proper health authority, *station agents will require an affidavit from the shipping undertaker, stating how the body has been prepared, and kind of coffin or casket used, which must be in conformity with Rule 2.*

RULE 4. The bodies of persons dead of diseases that are not contagious, infectious nor communicable, may be received for transportation to local points in same State, when encased in a sound coffin or metallic case, and enclosed in a strong wooden box, securely fastened so it may be safely handled. But when it is proposed to transport them out of the State, (*unless the time required for transportation from the initial point to destination does not exceed eighteen hours*) they must be encased in an air-tight zinc, tin, copper or lead-lined coffin, or an air-tight iron casket, or a strong coffin or casket encased in a (soldered) zinc, copper or tin case, and all

Transportation of Corpses.

enclosed in a strong outside wooden box of material not less than one inch thick. In all cases the outside box must be provided with four iron chest handles.

RULE 5. Every dead body must be accompanied by a person in charge who must be provided with a ticket, and also present a full first-class ticket marked "corpse," and a transit permit from a board of health, or proper health authority, giving permission for the removal, and showing the name of deceased; age; place of death; cause of death; (whether of a contagious or infectious nature) the point to which it is to be shipped; medical attendant, and name of undertaker.

RULE 6. It is intended that no dead body shall be moved which may be the means of spreading disease, therefore *all disinterred bodies, dead from any disease or cause, will be treated as infectious* and dangerous to the public health, and will not be accepted for transportation, unless said removal has been approved by the State Board of Health, and the local health authority, and the disinterred remains enclosed in a (soldered) zinc, tin or copper-lined coffin or box, or box encased in (soldered) zinc, tin or copper case.

NOTE.—Local boards should refuse to grant a permit where the cause of death is given as "heart failure," unless the physican states that it was not the result of diphtheria. In case of disinterment, the permit from the State Board of Health must be attached to the transit permit, and delivered to the person in charge of the corpse. If more than one body is shipped at one time, a separate permit must be issued for each body.

TRANSPORTATION OF DECEASED PERSONS IN BAGGAGE CARS.

To Railroad Agents, Station and Train Baggagemen:

You will in no case receive a corpse for transportation unless accompanied by a physician's, coroner's or board of health certificate, also an undertaker's certificate that the body has been prepared for burial and shipment in accordance with the rules of the State Board of Health, *nor will you receive it even with such certificates if fluids are escaping from the case, or it has become offensive in any degree.* One *full* first class *limited* or *unlimited* ticket will be required for the transportation of a corpse without regard to the age of the deceased, and a corpse will not be taken for transportation except there is a passenger with it in charge, and the word "corpse" be plainly written on the face of a local, and on each coupon of a coupon ticket. A record must be made of all bodies shipped and carried, on the back of your station and trip reports, giving name of deceased, and destination.

It will be the duty of agents and baggage agents to see that each burial case is properly marked on the "paster," giving date and at what station shipped, point of destination, "State," number and form of ticket, name of passenger in charge and place of residence, with name of agent. If the corpse is destined to a point beyond the initial line, the initials of each road over which it passes must be written on the paster; also the terminal point

Transportation of Corpses.

of each road at which transfer is made with the connecting line, as shown on the coupons of the ticket.

You will see that the "certificate of undertaker" is properly filled out by him, and the paster is properly filled out by yourself and is securely pasted to the coffin box before it is put into the car, and the permit remaining, you will hand to the passenger in charge of the corpse.

The whole form must be made in *duplicate*, either with a pen, carbon paper or simplex paper, and the signatures of the physician or coroner and undertaker must be on *both* the original and the duplicate copies.

The undertaker's certificate and paster of the *original*, will be detached from the physician's certificate and permit and pasted to the coffin box. The physician's certificate and the permit will be handed to the passenger. The *whole duplicate* copy will be sent to the general baggage agent of the initial road by first passenger train.

All this information is necessary to insure the prompt and correct transportation of the corpse.

The following is the form of the Permit required:

No..... Give your Station Baggage Number.

STATE OF IOWA.

HEALTH DEPARTMENT. TRANSPORTATION OF CORPSES. TRANSIT PERMIT

This certificate must be presented to the Local Board of Health for approval.

PHYSICIAN'S OR CORONER'S CERTIFICATE.

.....189....Name of deceased (if minor, give parents' name also).....
date of death.....age.....years..... .months.....days. Place of death.....cause of death... ..

I hereby certify that the above is true to the best of my knowledge and belief.

.....M. D. or Coroner.

Residence.....county of.....State of.....

PERMIT OF LOCAL BOARD OF HEALTH.

This permit must be properly signed, and with Physician's certificate presented to the railroad or express agent before a body can be shipped.

In the (city or township).....of.....county of.....State of.....on the.....day of..... 189 ..... Permission is hereby given to remove for burial at.....in the county of.....State of.....the body of.....who died at.....county of.....on the.....day of.... .18.....aged.....years ....months....days. The cause of death being.....which is a (contagious or non-contagious).....disease.

Signed: .....President,

[If City or Town affix corporate seal] ....Clerk,
Local Board of Health.

This permit and preceding certificate must be detached and delivered to the person in charge of the corpse.

Transportation of Corpses.

This Certificate and the Paster below must be detached at this perforation and pasted to the coffin box.

PASTER.

Transit Permit No.....

CERTIFICATE OF UNDERTAKER.

I, (or we) hereby certify that the accompanying dead body of..... (If a minor, give the parents' name also.).....Consigned to..... Address.....State of....., has been prepared by me (or us) strictly in accordance with the rules of the Iowa State Board of Health for transportation by railway, and in conformity with said rules, as printed on the back of this permit.

....., *Shipping Undertaker.*

Residence, ...

Station Baggagemen must enter hereon a description of the ticket, the exact route via what Junctional Points the Ticket Reads which is held by the passenger in charge of corpse.

SPECIAL INSTRUCTIONS.—A burial case containing a corpse will not be received for transportation, nor this paster be used, without the person in charge of the remains presents a certificate of the attending physician or coroner, or a permit from the board of health, *and an undertaker's certificate*, that the body has been prepared for burial according to the law of the State. Neither will it be received if any fluids are escaping from the case or in any degree offensive. Agents will detach the undertakers' certificate and this paster at the perforation, and paste them securely on the cover of the case before shipping.

Date.....189....

From .....to.....State .....
No. of ticket.....Form No. of ticket.....
Via.....R. R. To.....
Via.....R. R. To.....
Via.....R. R. To.....
Via.....R. R. To.....
Via.....R. R. To.....
Via.....R. R. To.....
Name of passenger in charge.....
Place of Residence.....
Signed.....*Station B. M.*

The following circulars were issued to all railroad companies and undertakers:

Transportation of Corpses.

THE STATE OF IOWA.

HEALTH DEPARTMENT.

OFFICE OF THE IOWA STATE BOARD OF HEALTH,
DES MOINES, August 15, 1890.

To all Railroad Companies, General Baggage Agents, Train Men, Station Agents, and Express Companies.

Complaint is made by several railroad General Baggage Agents, who are endeavoring strictly to enforce the Regulations of the State Board of Health, and of the National General Baggage Association, regarding the transportation of corpses, that bodies are delivered from connecting roads, when the transportation permit accompanying the body states cause of death was diphtheria. Transportation of persons dead from diphtheria is positively prohibited within this State, under any conditions. Diphtheria has been changed from the permissible transportable to the prohibited list of diseases, for the protection, not only of the public, but of railroad companies and train-men.

As a matter, therefore, of protection, justice, economy, and obedience to law, it is imperative that these regulations be rigidly observed on all railroads operated in this State.

It having come to the knowledge of the State Board that physicians, through ignorance, or design, in many instances, give the cause of death as "*heart failure*," which is a sequala of diphtheria, when the real cause was diphtheria, the State Board ordered that a return giving "heart failure" as cause of death, must not be accepted by the county clerk, but returned to the physician for the proper specification.

Railroad train men, and station agents would, therefore, be fully justified in deeming as suspicious, if not in absolutely rejecting a corpse accompanied with a permit in which the cause of death is given as "heart failure," where the age of deceased is under thirty years, unless there is positive statement in the permit, that the "heart failure" was not the result of diphtheria. It is known that serious results, and the loss of many lives, have followed the shipment of a corpse under such a false return of the cause of death.

In accordance with the rules and regulations adopted by the National Association of Railroad General Baggage Agents, and the Iowa State Board of Health, whenever it is desired to disinter the dead body of a human being for removal or transportation, application for permission so to do, must be made to the State Board of Health.

No disinterred body must be received for transportation, by any railroad, unless accompanied by a special disinterment permit from the State Board of Health, which is additional to the regular transportation permit.

The disinterment permit must be approved by the local board of health of the jurisdiction where the body was interred.

Transportation of Corpses.

Depositing bodies in a receiving vault is deemed a burial, and a disinterment permit is required for removal.

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

STATE OF IOWA.

HEALTH DEPARTMENT.

OFFICE OF THE IOWA STATE BOARD OF HEALTH,
Des Moines, April 1, 1891.

To all Undertakers and Railroad Companies:

By reason of the frequent shipment of the bodies of persons dead from diphtheria, under the statement that the cause of death was "heart failure" or some other sequela of that disease, and non-contagious, thereby greatly endangering human life, at a meeting of the Iowa State Board of Health, held Thursday, Nov. 20, 1890, it was ordered that the transportation of the bodies of persons dead from diphtheria be prohibited in this State, and that the word "Diphtheria" be stricken from Rule 2, of the Rules and Regulations for the Transportation of Corpses, and that the word "Diphtheria" be inserted in Rule 1, after the words "Small Pox."

Undertakers, baggage men and railroad station agents, are hereby notified to govern themselves accordingly.

The following resolution was also adopted:

Resolved, That a return of a death made by a physician giving "heart failure" as a cause of death shall not be deemed a sufficient return, and such must be returned to the physician who made it for the proper correction and and definition.

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

The following is the form of a disinterment permit:

STATE OF IOWA.

HEALTH DEPARTMENT.

DISINTERMENT PERMIT.

Application having been made for the disinterment of the dead body of ..... (give the full name here, whether it be one, two or three, use no initials.)now lying buried at....., the county of ....., State of Iowa, and who died on the ..... day of ....., 18...., aged ..... years, ... months, ... days, the cause of death being..... ..... which is a ..... (contagious or non-contagious) disease, as shown by the certificate of death, of said deceased, given by....., attending

Transportation of Corpses.

physician, this is to certify that permission is hereby given for such disinterment by the Local Board of Health of the..... .....of.....this .....day of.....18.., upon approval thereof by the State Board of Health.

Attest:

{ If a City or Town, affix corporate seal. }

....., *President.*
....., *Clerk.*

The foregoing application for the disinterment of the body of ..... is hereby approved, it being understood and provided that nothing herein shall be deemed as contravening or in anywise modifying or releasing the regulations of the State Board of Health governing the transportation of corpses, or the requirements for a transit permit, and all transportation companies will be governed accordingly.

Given under my hand, and seal of the State Board of Health at Des Moines, this..... day of....., A. D. 189..

....., *Secretary.*

The following circular was issued to all undertakers:

THE STATE OF IOWA.

HEALTH DEPARTMENT.

OFFICE OF THE STATE BOARD OF HEALTH,
DES MOINES, June 1, 1891.

To all Undertakers:

In accordance with the rules and regulations adopted by the National Association of Railroad General Baggage Agents, and the Iowa State Board of Health, whenever it is desired to disinter the dead body of a human being, for removal or transportation, application for permission so to do, must be made to the State Board of Health.

The application must state the full name of the deceased, also the age, cause of death, name of physician who made certificate of death, place of burial and where to be reinterred.

No disinterred body will be received for transportation by any railroad unless accompanied by a special disinterment permit from the State Board of Health. which is additional to the regular transportation permit.

The disinterment permit must be approved by the local board of Health of the jurisdiction where the body lies buried.

Depositing bodies in a receiving vault is deemed a burial, and a disinterment permit will be required for removal.

Undertakers and others will save possible delay and trouble by strictly conforming to these instructions. These regulations apply equally to all express companies.

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

PUERPERAL FEVER.

ITS CAUSE AND PREVENTION.

One of the saddest occurrences that can come to any home is to have the wife and mother stricken down with child-bed fever.

The happy, and yet responsible, consummation of motherhood, has been looked forward to for weeks and months with interest, and on the part of many, with fearful forebodings. Hope and the natural maternal instincts afford pleasurable anticipations as the time for "confinement" approaches:—And yet these pleasurable anticipations are mixed with fear, as the expectant mother hears of one here and there who has died in this trying hour.

The long looked for time, however, has come, the trial is over, and mother and babe are safe. The mother is happy because of her babe—the babe contented because it has a mother to supply its limited wants. The husband congratulates his wife, and the doctor or midwife leaves the house with the benedictions of father and mother, and congratulates himself on his skill. Three or four days pass by, and the midwife or medical attendant, is hastily summoned with the information that the mother has had a chill, and there is fever and abdominal soreness. Puerperal fever is found to have set in, and in a few days the husband is wifeless, and the babe motherless! All the fond hopes of the husband and wife and friends have been ruthlessly crushed. Too often the calamity is regarded as a mysterious providence, and the real cause is overlooked.

There is no fact in medicine better established than that *puerperal fever is a clearly preventable disease*, and if so, every case that occurs does so because some one has blundered—has done something that should have been left undone; or neglected something that should have been done.

This leads to the question as to what puerperal fever is, and what produces it? A great deal of discussion has taken place upon this point. Some contend that it results from a peculiar micro-organism which produces that disease alone, and that the disease is propagated by contagion—a contagion that is especially virulent. Others claim that it is puerperal septicæmia—a surgical fever,

and results wholly from the absorption into the system of decomposing products—a septic fever; that this poison may be generated, or supplied by the woman herself by decomposing substances which are absorbed through lacerations and abrasions occurring during labor. At other times, the poison may be communicated to the woman by the hands or clothing of the nurse or medical attendant from some case of erysipelas, or a previous case of puerperal fever.

Many claim that child-bed fever may result from carelessness on the part of persons attending cases of erysipelas, diphtheria, and scarlet fever. One fact is well established, that puerperal fever may become epidemic—not through atmospheric conditions, but by being conveyed directly from one lying-in woman to another. It has often happened that a physician or midwife has had several cases in succession, and has only been able to break up the succession by refusing to attend such cases for a time, or by practicing the most rigid and thorough disinfection.

The mortality from this disease in lying-in hospitals has often been most fearful, so that the use of hospitals for such purposes was greatly discountenanced. Under proper anti-septic methods, however, the death rate has so diminished that scarcely one per cent of the persons confined have puerperal fever, and in general hospitals, where erysipelas and other surgical affections are treated, it has been found that lying-in wards can be maintained with but little risk.

From all this, the generally accepted opinion is, that puerperal fever and puerperal septicæmia are identical—that both are a surgical fever to be successfully prevented by antisepsis.

There is reason to believe that milk fever, milk-leg, puerperal mania, and several other child-bed accidents are the result of the absorption of septic material—poisonous products resulting from animal decomposition—which find their way into the circulation through puerperal wounds.

If this theory is generally accepted, and acted upon, the time would soon come when, instead of one case of this dread disease occurring in every one hundred and twenty-five women who are confined, the disease would be unknown, or occur only often enough to warn attendants upon cases of labor that carelessness would still result in the production of the disease.

The foregoing sufficiently points out its character and cause. The following suggestions for the prevention of the disease are commended to all physicians and midwives in their attendance upon women in labor, believing that a strict and faithful compliance with them will save many valuable lives, much mortification, and many bitter regrets:

1. The strictest cleanliness on the part of the midwife (by which term is meant the medical attendant, whether man or woman,) and nurse during, and subsequent to delivery. The finger nails must be closely cut, the secretions from beneath them carefully removed, and the hands and forearms throughly washed with soap and water as hot as can be borne. After being dried, they should be bathed in a bi-chloride of mercury solution (1-2000.)

2. All instruments used about the woman should be thoroughly cleansed and disinfected before and after such use.

In the Prussian Manual of Midwifery, a solution of carbolic acid is used instead of the mercurial solution. It is made by putting one ounce of carbolic acid into two pints of water. The mixture should be made in a bottle and shaken, so as to insure a thorough admixture and prevent settling. In this solution all the instruments should be immersed, and in a solution of the same strength the hands and forearms thoroughly bathed before and after each examination of the patient.

3. The clothing of the midwife and nurse should be scrupulously clean, and if previously worn in visiting a case of erysipelas, scarlet fever, diphtheria, or especially child-bed fever, should be substituted by an entire new outfit, unless the most efficient disinfection and cleansing had taken place.

4. Not only must everything used by the midwife and nurse be scrupulously clean, but the clothing of the lying-in woman, her bedding, and everything about her, should be absolutely clean, and frequently disinfected.

DROWNED—WHAT TO DO.

It should be generally known that not all cases of drowning are necessarily fatal. Persons have been under the water for as much as two hours, and yet by proper means, have been resuscitated.

There are just two important things to do. The first and most important, as well as the all-essential thing, is to *restore the breathing:* and the second, which almost follows as a sequence, is to *restore animal heat.*

To accomplish the first, remove or loosen all the clothing that would in any way impede the breathing; place the person on his face with his head as low as possible. Step astride him as in Fig. 1, with the face toward his head, and interlocking the fingers underneath his abdomen, raise the body as high as possible without lifting the head from the ground. When the body is thus elevated, give it a smart jerk in order to dislodge any mucus or water from the throat or windpipe. The body should be held thus for nearly half a minute, repeating the jerking three or four times.

Fig 1.

Then step forward a very little, as in Fig. 2, grasp with the hands the clothing at the shoulder joints; or if naked, press the fingers into the armpits and placing the thumbs over the shoulder, raise the body as high as possible without quite lifting the head from the ground, and hold it in this position long enough to count slowly *one, two, three, four.* Then lower him gently to the ground with the forehead resting upon his flexed arm, the neck straight, and the mouth and nose free, as in Fig. 3. Then with the

Fig. 2

hands and arms placed as in Fig. 3, press downward toward the abdomen, and inward, with increasing force, until *two* or *three* can be counted slowly. Then suddenly relax the pressure, grasp the shoulders as in Fig. 2, and raise the chest to be followed again by the movements given in Fig. 3. This alternate change of movement as illustrated by Figs. 2 and 3 should be repeated fifteen or twenty times per minute for an hour, or an hour and a half, unless breathing is restored sooner. Sometimes it is an advantage, if breathing is not restored in a half hour, to place the arms by the side, gently raise them until they nearly touch the face on each side, then return them to the sides of the body again. This movement should be made ten or twenty times per minute. In order to accomplish this as readily, and with as little fatigue as possible, the operator should stand with his face toward the feet of his patient—the feet being close to face on each side. The forehead of the patient should be supported by a round block of wood, covered with a light cushion.

Fig. 3.

It would be well, if convenient, if all these manipulations could take place in a warm place, where the animal heat could be preserved as much as possible. If the least signs of vitality are given, as evidenced by restoration to breathing, the body should be wrapped in hot blankets, hot mustard plasters should be applied over the heart and chest, and hot bricks, or bottles with hot water should be applied about the body. All parts of the body, so far as possible, should be warmed equally—so as to equalize the circulation of the blood. Rubbing the body briskly with hot salt, in warm cloths; or with a warm hand; and slapping the muscular parts of the body with the open hand, will greatly assist. If able to *surely* swallow, give small quantities of hot milk or tea; place the patient in a warm bed and keep him quiet, and let him have plenty of fresh air. Keep the crowd of curiosity seekers away.

Recapitulation. *Be prompt. Secure breathing as soon as possible. Whatever else may be neglected, don't delay the efforts to restore the breathing.* All else is only secondary. If the patient for any cause is turned on the back, the tongue must be drawn forward, and held in that position—else it will drop into the throat and stop breathing. *Don't abandon hope under a couple of hours' effort at any rate.*

KEROSENE OIL.

During the biennial period marked improvement has been made in the inspection of products of petroleum throughout the State. Several instances have been reported of lamp explosion that, when investigated, proved no explosion at all. No loss of life has occurred within the State during the period. The most serious injury was that in the case of a woman in Council Bluffs, reported by the newspapers as a lamp explosion. An investigation demonstrated that a lamp, long used, had been burning all night. The cap for covering the orifice through which the lamp was filled, had been lost, a rag had been used as a stopper and had become saturated with oil. Early in the morning, the mother removed the chimney and set a tin cup over the wick tube for the purpose of warming milk. This deflected the flame, overheated the wick tube, and ignited the oil-saturated rag used for a stopper, and the lamp was soon all aflame. The mother seized the lamp and threw it out doors. In doing so the oil was scattered over her clothing, and before the flames could be extinguished she was badly burned.

In each of the other instances reported, the cause of injury has been traced to gross carelessness in using the lamp. Several cases have been reported of injuries from lighting fires with kerosene, but neither the inspection service, nor the statute, are intended to protect against so foolhardy and dangerous a practice.

One of the greatest sources of trouble in the inspection service has been the use of inspectors' brands by agents of tank line companies and dealers. At the November meeting of the State Board Rules 5, 6, 7, 8, 9, and 11, for the inspection of products of petroleum where rescinded, and the following substitutes adopted:

Kerosene Oil.

RULE 5. All instruments, testers and thermometers to be used by inspectors, must be procured from the office of the State Board of Health.

RULE 6. Inspectors must have all previous brands of tests, from packages, casks or barrels removed before affixing their brand thereon.

RULE 7. Brand No. 1 must be circular in form, not less than eight inches in diameter, outside measurement, with ample margin to protect the vessel or barrel from the stencil brush, and must contain the following words: "Approved, flash test.....degrees, Iowa." And, also the name of the inspector, date of inspection and degree of test. It must also be arranged for adjustible dates, and the degrees of test.

RULE 8. Brand No. 2 shall be square in form, not less than seven inches outside measurement, without date, and must contain the following words: "Rejected for illuminating purposes..... inspector, Iowa." It must contain the name of the inspector.

Brand No. 3 shall be of like form and dimensions as brand No. 1, and shall contain the words: "For illuminating cars, (Approved or Rejected as the case may be).....degrees, Iowa.....189..... .....Inspector." It shall have adjustible spaces for dates, degrees, and the words "approved" and "rejected." It must also contain the name of the inspector. No oil must be approved for illuminating cars that burns at a temperature below 301° Fah.

Brand No. 4 shall contain the word "Rejected," in letters not less than three-fourths inches square, to which shall be added the name of the inspector, and the word "Iowa." This brand shall be affixed to packages, casks or barrels containing gasolene, benzene, and naptha.

RULE 9. The inspector's brand must be placed on the package, cask or barrel, with bright colors, in clear, distinct letters, and must be affixed by the inspector in person, or by some person under his personal supervision and control who is not directly nor indirectly, interested in the manufacture nor sale of any product of petroleum. No package, cask or barrel shall be branded previous to being filled with oil. The brand of an inspector is deemed to be his official signature, and must not be permitted to pass out of his custody or control.

Upon the adoption of these rules the State Inspector promptly gave instructions to his deputies, that they must be enforced, and that under no circumstances must their brands be used otherwise than in accordance with the rules.

It was ascertained that farmers throughout the State were in the habit of purchasing kerosene in Chicago, and other cities, through their Alliance agencies, which was shipped direct to them without inspection. In several instances the oil was seized by inspectors, and the purchasers, under the law were necessarily fined, although they pleaded ignorance of the law in defense. In some of these cases the oil was condemned as not being of lawful standard, and

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in some cases actually dangerous, thus evidencing that the purchaser had not received what he purchased. To prevent this contraband traffic, circulars were furnished the Secretary of the State Farmers' Alliance, setting forth the requirements of the statute, and by his courtesy, they have been sent to every district and county Alliance in the State, and there is good reason to believe this contraband traffic will soon cease.

LEGISLATIVE SUGGESTIONS.

There is imperative necessity for additional legislation in behalf of human health and life. Iowa, one of the grandest States in the Union, is far behind many of her sisters, in sanitary and hygienic matters.

The policy of the State has been to build up and maintain a first-class university at Iowa City—complete in all its departments.

The medical department cannot be first-class in the facilities afforded; cannot afford the clinical and bedside observation needed without a hospital, as nearly first-class in all its apartments as possible. The medical department has not now, and cannot afford such a hospital. If the State would properly maintain these medical departments it should supply the proper hospital facilities.

But better facilities for surgical and pathological work are not all that could be secured by such an institution. It could be made the means of training a corps of nurses, the need of whose services has been felt in every town in Iowa.

In regard to the importance of trained nurses, and in behalf of this project for the Medical Departments in Iowa City, the following extract from a paper presented by Dr. H. A. Gilman, superintendent of the Hospital for the Insane at Mt. Pleasant, to the last annual meeting of the State Medical Society is commended:

"A constant and persistent effort must be made to increase the efficiency of the working force of each hospital. It is frequently the case that we are compelled to employ as nurses and attendants, young men and women from the country or town with no experience whatever. They may learn aptly and become valued employés; many, however, will not, and the weeding out

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process must continually go on. The training school in many institutions is doing much to educate proper attendants, but I feel that in connection with the Medical Department of the State University there should be constructed a hospital and training school for nurses and attendants, who could have the advantage of lectures on anatomy and physiology, pharmacy and practical demonstration of the care of the sick at the bedside, and at the same time have the advantage of lectures by the Chair on mental diseases, adapted to persons seeking to enter the profession of nurses and attendants. By such a course of instruction we can have such material to draw from for attendants in our hospitals as will warrant the best possible efficiency, and guarantee that skilled and conscientious care which the superintendent of every hospital is constantly seeking for, in each case placed in charge."

There is great necessity for a Chair of Sanitary Science, and Preventive Medicine at the State University, State Agricultural College, and State Normal School. Such a chair could provide instruction on bacteriology; the cause of epidemics; sanitary plumbing and engineering; climatic influences and the requirements of health resorts; the causes of contagious and infectious diseases, with their symptoms and treatment, and the best means for their prevention or restriction; quarantine, isolation and disinfection; ventilation; the water supply and its protection against defilement; food products and the best means of cooking and serving them; adulterations; legislative enactments regarding the public health, and many other topics of great sanitary and hygenic importance. This instruction should be given by lectures, and with the assistance of the botanist and chemist, could be illustrated and demonstrated, and given such a practical character that graduates would go home better equipped for their life work. The coming physician must be a sanitarian in a better and broader sense than is the physician of to-day. The expense of such an additional chair need be little more than the salary paid the lecturer. The school teachers throughout the State have always manifested a lively interest in such measures as tend to promote the public health, and the State Superintendent of Public Instruction, with the whole corps of county and city superintendents, have been prompt and efficient co-operators with the State and local boards of health. This branch of instruction, this great and but little explored field of information, is becoming more and more inviting and popular each year, and justly, as well as naturally so, since a "sound mind in a sound body" constitutes the greatest force in the universe.

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The legislation asked by the superintendents and trustees of the hospitals for the insane is most heartily commended.

For the more efficient enforcement of sanitary and hygienic measures in cities and towns, there should be an enlargement of the powers of such corporations, granting them power to create and maintain a health department, to be given authority over all matters pertaining to the public health, subject to control by the city council.

The State Board of Health, always modest in its demands, has but little to ask for itself.

The Board should have the same authority in matters of the abatement of nuisances, and the establishment and maintenance of quarantine that local boards have; to be exercised only upon the petition of resident citizens, setting forth that, for any cause, the local board refuses or neglects to properly protect the people, and this authority should be enforced by proper penalties in case of refusal to comply.

Numerous instances occur where the most flagrant violation of sanitary laws, and even of decency, exist in communities, yet because of social, business and even political reasons, no redress is, or can be had through local boards, and victims, whether one or many, are compelled to suffer. In such cases, the State Board, composed entirely of disinterested persons, should have the power to make investigation, and give such orders, as may be deemed necessary in the premises.

Adequate penalties should be inflicted upon parents or guardians, physicians, midwives and coroners for refusing or neglecting to report on or before the first day of each month, all births or deaths coming under their professional or official notice, for the month previous; and providing some compensation for each birth or death so reported.

The clerks of the district courts should be required to compile and forward a report of all marriages, births and deaths, occurring in their respective counties to the secretary of the State Board of Health, on or before the tenth day of each calendar month, for the month preceding, instead of *annually*, as at present.

The Board is greatly embarrassed for want of sufficient funds to prosecute additional investigations, relating to the sources of disease in localities, making proper sanitary surveys, analysis and

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personal visits to infected localities, as well as the publication of a larger edition of the BULLETIN, and of circulars and pamphlets relating to public health, and the prevention and restriction of contagious diseases. If the annual appropriation could be made $6,000 instead of $5,000, as at present—especially if the surplus in a fortunate year could be held by the auditor for use, upon proper specified conditions, in a time of emergency, instead of being returned to the treasury, it would greatly aid the Board in its work. Illinois appropriates annually $20,000 for sanitary work —$10,000 to be used as needed by the Board in its regular work, and $10,000 at the disposal of the governor, to be used for special investigations in cases of emergency, etc. Iowa has had but $5,000 annually, with which the expenses of the Health Department of the State must be paid, and as a result much needed investigations have been prevented.

There is also much needed legislation for the regulation of plumbing, and the construction of buildings, by providing a system of inspection. In all the larger cities in the State, the hazzard of life, health, and property is being constantly augmented for want of the necessary protection.

There is increasing necessity for greater protection from the pollution of rivers, ponds, and sources of water supply. The rapid increase of population in cities and towns, and of factories, has increased the sources of pollution of rivers, water courses, and sources of water supply, far in advance of the inhibition of statutes enacted many years ago, and which should be amended so as to conform to the exigencies of the present time.

The statute prohibiting barbed wire fences around public school-houses, should be amended so as to apply to all school-houses. There are numerous parochial school-houses in the State, equally amenable to the objection made in the case of public schools, and the necessary protection to human life is as important and imperative in one case as in the other. As the law now is, it is distinctly class legislation. During the biennial period several complaints have been filed with the State Board, regarding this defect in the statute.

It has been demonstrated in England, and Germany, in several States in America, and in this State also; that through health measures, a large reduction can be made in the death-rate. This can be

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still further reduced from diseases known to be preventable, through means which are being recommended by the State Board of Health. The dissemination of these means would be the most profitable investment the legislature could make of a few thousand dollars. Diphtheria, scarlet fever, and typhoid fever, are prevalent in the State nearly the year round, and in some localities frequently recurring as epidemics, and generally for want of knowledge as to the proper methods to prevent them. These outbreaks are becoming too frequent to be visited by members of the State Board, who may be so circumstanced, also, that they cannot respond to emergencies demanding immediate attention. If they go, they must neglect their own patients, pay their own expenses, and perform the service without compensation. That is not right. Provision should be made for compensation for this service, and also for the employment of competent persons to visit and aid localities in suppressing contagious diseases. A contingent fund should be provided for this purpose.

METEOROLOGICAL TABLES—COMPARATIVE STATEMENTS.

1839—IOWA CITY*—1859.

Elevation above sea level, 645 feet.

YEARS.	COMPARATIVE MEAN TEMPERATURE (DEGREES).													COMPARATIVE PRECIPITATION (INCHES).											
	June.	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	Average mean for year.	June.	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	Total for year.
1839	70.6	75.7	73.1	61.1	60.7	35.1	23.9	22.2	31.8	40.5	62.7	68.9	53.03	....	....	....	....	....	....	....	....	....	....	....	.....
1840	72.4	73.9	72.1	63.1	52.6	41.9	29.6	19.5	28.2	38.3	52.9	63.1	50.64	....	....	....	....	....	....	....	....	....	....	....	.....
1841	71.1	70.4	65.5	58.5	55.0	38.2	28.8	20.9	26.1	37.1	51.6	58.1	48.68	....	....	....	....	....	....	....	....	....	....	....	.....
1842	65.6	68.4	68.7	64.5	55.5	30.2	21.6	20.3	28.1	45.8	53.3	57.9	48.82	....	....	....	....	....	....	....	....	....	....	....	.....
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	45.11	....	....	....	....	....	....	....	....	....	....	....	.....
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	48.81	....	....	....	....	....	....	....	....	....	....	....	.....
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	48.39	....	....	....	....	....	....	....	....	....	....	....	.....
1846	66.1	73.6	72.0	65.9	43.0	39.1	28.9	31.2	24.2	40.6	52.7	64.1	50.00	....	....	....	....	....	....	....	....	....	....	....	.....
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	44.64	....	....	....	....	....	....	....	....	....	....	....	.....
1848	64.3	64.9	66.7	56.3	43.9	30.8	19.1	28.0	28.4	35.2	45.1	62.0	45.31	2.50	5.70	9.10	3.00	4.30	1.40	1.29	1.30	1.60	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	45.09	12.20	1.40	12.20	5.00	4.80	6.60	1.14	2.82	1.30	2.41	4.70	4.70	59.27
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	44.76	3.50	5.00	13.00	3.90	2.70	3.59	2.87	4.62	0.80	2.08	3.30	3.70	38.06
1851	46.6	71.6	69.1	68.3	50.4	34.5	21.4	24.0	27.7	38.2	43.5	58.2	46.12	14.30	8.60	14.00	3.50	1.40	3.63	2.95	1.55	5.34	3.03	3.60	12.60	74.50
1852	66.8	72.4	69.0	59.8	53.2	30.0	22.2	19.6	29.0	36.2	32.2	60.9	45.86	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	47.38	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	70.2	73.0	68.2	44.4	36.8	27.8	16.2	28.5	39.9	51.1	60.0	47.5	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	60.4	47.5	4.75	2.35	3.51	1.84	2.86	2.18	2.15	1.68	0.70	1.87	2.55	1.94	28.68
1856	71.8	73.5	65.4	59.6	52.4	32.8	15.6	7.5	15.0	25.8	49.5	61.4	44.14	2.86	2.74	1.36	2.45	5.21	4.35	6.25	0.12	4.46	0.57	3.44	4.39	38.20
1857	65.1	74.2	70.9	63.8	47.9	31.2	31.4	6.2	28.8	29.9	38.3	53.9	44.9	0.90	4.67	6.00	1.80	1.95	4.77	1.85	0.61	5.80	3.33	5.09	2.75	39.52
1858	70.6	78.8	79.9	66.0	52.0	32.6	25.5	30.6	16.0	38.7	46.1	54.3	49.2	6.70	7.30	4.12	6.10	4.90	4.54	1.82	1.60	2.00	2.20	2.00	8.40	51.68
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	46.45	5.82	2.93	1.70	1.80	0.85	1.33	1.81	0.94	1.72	5.01	1.05	7.49	32.70

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

METEOROLOGICAL TABLES—CONTINUED.

1859—MUSCATINE*—1874.

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Elevation above sea-level, 520 feet.

YEARS.	COMPARATIVE MEAN TEMPERATURE (DEGREES.)													COMPARATIVE PRECIPITATION (INCHES).											
	June.	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	Average mean for year.	June.	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	Total for year.
1860	69.3	71.7	68.06	54.3	51.3	35.7	17.5	21.3	26.6	42.7	49.6	64.3	47.9	3.66	4.03	2.30	2.76	1.09	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	46.28	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	59.4	45.91	6.07	3.10	7.30	6.10	2.49	3.29	2.75	0.29	0.38	4.06	5.39	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	41.63	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	66.0	47.8	45.8	19.3	15.9	27.4	32.6	46.1	62.2	46.95	5.70	5.00	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	29.5	31.5	34.3	48.1	61.4	50.2	6.99	7.30	1.35	3.75	6.35	0.25	0.33	0.30	3.15	3.57	0.31	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	47.65	4.76	6.55	6.85	6.53	4.61	1.41	2.34	4.19	0.79	0.83	2.32	1.50	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	47.00	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	48.11	1.28	6.15	4.67	5.17	0.53	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	26.0	27.0	30.4	47.1	60.0	47.11	7.42	7.42	11.43	3.09	2.07	3.52	2.46	1.56	2.65	0.43	3.16	4.66	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	50.2	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	73.8	60.1	52.8	29.0	15.6	22.1	26.2	42.3	....	65.9	....	9.16	5.56	5.23	0.09	5.51	3.77	2.13	1.51	3.10	5.56	3.30	2.00	66.63
1872	70.5	74.0	74.8	62.9	48.1	27.3	12.6	16.9	23.2	28.3	48.8	58.6	45.75	7.59	5.85	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	45.25	4.44	3.24	0.65	2.97	2.06	0.82	4.24	....	0.30	....	....	5.55	.....
1874	....	....	....	....	....	....	....	....	....	42.3	52.1	....	.....	....	....	....	....	....	....	....	....	....	....	....	....	.....

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

METEOROLOGICAL TABLES—CONTINUED.

1874—DAVENPORT—1891.

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

YEARS.	COMPARATIVE MEAN TEMPERATURE (DEGREES).													COMPARATIVE PRECIPITATION (INCHES).												
	June.	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	Average mean for year.	June.	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	Total for year.
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	49.63	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	39.1	45.7	60.5	44.96	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	20.9	30.1	32.1	56.0	62.1	49.20	4.25	4.82	4.27	5.50	1.54	2.54	0.36	3.47	3.63	4.34	5.39	6.79	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	50.8	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	52.22	4.36	2.19	5.07	1.82	4.21	0.93	0.98	0.36	1.00	2.21	2.89	5.14	31.12
1879	69.5	76.9	71.7	60.5	50.8	39.9	30.8	18.4	25.5	39.5	50.5	63.8	50.56	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	51.03	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	55.5	39.7	38.2	13.8	19.9	28.8	44.6	69.0	50.39	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	51.76	8.53	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	48.32	4.38	3.66	1.02	0.72	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	48.72	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	45.01	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	47.90	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	72.2	64.4	47.5	37.0	24.0	13.2	23.8	34 3	52.3	67.1	48.9	1.43	4.87	3.23	5.45	3.41	1.13	3.26	1.43	4 87	0.77	1.17	1.76	32.78
1888	69.6	74.4	69.6	58.0	46.9	38.3	30 5	9.7	20.8	30.1	49.5	55.2	46.29	3.83	7.31	2.79	1.38	2 81	3.54	2.59	1.54	1.17	2.70	1.57	9.23	40.46
1889	66.7	73.8	72.1	62.8	49.0	36.6	39.6	25.2	19.0	39.3	49.7	59.3	48.67	5.59	8.25	1.11	3.27	1.26	2.17	1.60	0.95	1.44	1.74	3.89	6.34	37.61
1890	74.0	76.0	70.0	61.8	52.0	42.0	30.4	27.0	31.0	36.0	53.0	58.0	49.68	4.51	0.85	1.66	2.34	3.63	1.37	0.62	2.49	1.10	2.34	0.86	4.33	24.50
1891	71.0							28.0	26.0	29.0	52.0	58.0		3.56							2.38	0.89	1.68	3.30	2.74	

METEOROLOGICAL TABLES—CONTINUED.

1874—DES MOINES—1891.

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

YEARS.	COMPARATIVE MEAN TEMPERATURE (DEGREES).													COMPARATIVE PRECIPITATION (INCHES).												
	June.	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	Average mean for year.	June.	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	Total for year.
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	50.7	39.3	21.4	18.7	39.9	39.9	51.2	64.2	51.32	6.69	0.29	1.98	2.79	3.18	5.49	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	51.01	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	49.86	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	52.36	12.16	4.78	3.14	0.15	5.94	2.81	2.50	0.63	2.28	2.28	3.47	3.53	48.67
1883	67.5	73.6	79.7	59.8	48.7	48.7	27.3	8.8	19.1	32.9	51.8	55.8	48.93	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	46.9	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	46 65	5.03	6.55	5.10	4.82	4.17	0.61	1.96	1.00	0.42	0.04	3.62	1.79	35.02
1886	71.3	78.4	76.8	65.1	57.3	35.8	19.2	10.9	24.8	34.9	52.7	64.4	49.67	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	72.4	63.8	48.4	37.3	22.9	11.5	19.4	35.7	52.5	65.7	48.25	2.25	1.97	2.66	5.36	1.40	0.52	1.41	0.83	1.65	1.79	2.48	2.31	24.63
1888	68.6	75.6	69.2	58.3	46.8	35.8	29.1	6.9	22.6	29.0	51.0	54.5	45.61	2.32	3.42	4.52	0.48	0.84	2.09	2.44	1.15	1.51	3.09	1.45	7.84	31.15
1889	67.4	73.8	72.0	62.8	49.2	34.4	39.5	21.8	19.6	39.2	50.4	60.5	49.22	2.32	4.37	2.25	3 41	0.52	1.29	0.57	1.22	0.27	0.11	2.66	4.84	24.13
1890	73.1	76.9	69.6	61.0	51.5	41.2	32.3	20.6	27.0	29.6	52.8	58.4	49.5	4.91	1.10	3.35	1.57	4.48	0.74	0.11	2.62	1.17	0.91	0.78	3.00	25.12
1891	69.3							28.3	23.2	28.8	52.0	57.8		5.60							1.82	1.13	2.25	2.12	3.29	

METEOROLOGICAL TABLES—CONTINUED

1874—DUBUQUE—1891.

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

YEAR.	COMPARATIVE MEAN TEMPERATURE (DEGREES).													COMPARATIVE PRECIPITATION (INCHES).											
	June.	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	Average mean for year.	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	46.86	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	60.7	44.85	4.75	5.39	1.07	6.11	2.71	0.48	2.71	1.66	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	47.61	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	67.4	74.7	73.0	66.2	51.7	35.0	46.0	15.2	34.8	37.1	48.2	62.2	50.15	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	50.6	4.35	6.71	1.72	6.94	2.85	0.76	1.12	0.49	0.93	2.44	4.34	4.61	38.26
1879	68.9	76.6	71.6	59.4	58.7	37.4	29.3	17.4	32.8	37.2	50.7	62.6	48.61	4.99	6.78	2.43	2.98	0.93	5.41	1.28	0.44	1.00	1.20	1.02	2.94	32.51
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	49.76	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	73.2	74.5	66.3	53.3	36.2	34.7	12.5	29.1	30.4	43.9	57.7	48.53	7.56	10.53	2.46	10.26	6.70	3.19	1.55	1.87	3.70	3.70	1.30	2.20	42.40
1882	67.2	69.0	71.6	62.6	55.3	39.2	33.4	24.1	35.7	37.0	48.5	54.4	49.0	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	46.62	5.34	7.90	2.70	2.09	4.44	1.65	1.88	1.59	2.60	0.32	1.93	7.10	39.65
1884	68.6	80.0	68.4	67.8	53.6	36.3	21.3	14.1	32.2	32.2	48.4	60.6	46.96	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	46.69	6.16	6.16	8.07	4.58	2.30	0.64	3.14	1.80	0.72	0.41	3.69	2.62	34.41
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	48.7	0.71	0.89	0.67	2.10	4.08	1.80	1.93	3.17	1.36	4.32	2.12	4.17	29.66
1887	71.9	77.3	78.2	71.0	46.3	25.0	22.9	11.5	20.7	32.4	50.7	66.6	49.59	1.32	2.44	4.40	7.72	2.22	0.74	3.07	3.33	3.56	1.80	1.37	2.53	32.50
1888	69.0	73.0	72.0	63.0	48.0	35.0	27.0	22.0	28.6	28.0	51.0	56.0	48.42	5.28	3.59	1.73	2.01	1.62	2.75	1.96	1.20	1.31	3.44	2.58	5.84	32.91
1889	74 0	75.0	68.8	60.0	51.0	39.9	27.0	26.8	23.1	27.7	50.8	58.2	.....	3.87	4.22	0.26	1.54	0.66	1.51	1.38	1.55	1.34	0.30	3.56	4.00	24.19
1890	70.0	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.59	1.21	6.00	3.72	6.43	1.85	0.82	2.31	1.25	1.68	2.94	5.36	40.26
1891	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2.34	.....	.....	.....	.....	.....	.....	1.27	0.98	2.69	1.64	2.54	.....

METEOROLOGICAL TABLES—CONTINUED.

1874—KEOKUK—1891.

YEARS.	COMPARATIVE MEAN TEMPERATURE (DEGREES).													COMPARATIVE PRECIPITATION (INCHES).											
	June.	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	Average mean per year.	June.	July	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	Total for year.
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	51.39	4.01	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	48.5	8.33	12.70	3.83	5.39	2.71	0.59	3.93	0.61	1.84	1.67	6.89	6.70	48.10
1876	69.7	76.4	75.8	64.4	51.8	36.2	18.8	33.8	34.2	31.6	52.6	63.5	50.31	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	52.9	7.82	6.90	2.52	3.61	7.01	3.05	3.90	0.51	0.15	3.76	4.29	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	69.2	55.17	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	36.9	22.6	29.8	42.6	52.2	66.8	52.99	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	53.46	3.06	2.25	3.81	5.21	2.02	1.13	0.67	3.91	1.94	1.83	4.79	5.92	34.84
1881	72.7	79.9	79.2	72.4	57.0	39.6	37.6	18.8	24.9	33.7	46.8	69.8	51.95	8.70	3.08	0.86	4.10	8.01	2.59	1.70	0.50	2.58	2.42	3.12	6.65	42.40
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	52.64	9.44	4 53	3.99	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	49.6	5.88	3.15	1.34	1.76	6.05	2.09	1.20	1.24	6.13	1.07	2.97	4.87	38.05
1884	71.5	75.0	72.0	71.1	58.4	40.6	29.0	18.7	27.5	37.3	50.6	62.3	50.66	4.07	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	48.31	6.97	2.29	5.98	3.77	2.59	0.88	1.96	2.44	1 14	0.17	2.53	2.59	34.11
1886	76.7	77.5	77.1	68.2	57.6	38.5	21 3	14.7	20.2	26.5	53.6	64.1	49.61	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	74.1	65.9	50.0	40.5	27.3	19.1	29.5	38.4	53.6	66.5	51.4	1.44	1.57	2.38	3.13	1.98	1.18	2.73	1.48	5.19	0.76	1.84	2.54	26.92
1888	70.3	75.7	70.8	60.0	48.6	39.2	32.2	13.6	25.7	34.2	53.2	58.6	48.29	5.42	6.09	2.07	2.13	1.62	2.83	1.61	1.57	2.17	2.43	1.85	5.06	34.80
1889	70.3	74.4	73.2	64.0	50.3	37.6	42.6	27.0	22.5	41.2	52.1	60.7	51.32	2.97	6.78	0.95	5.14	2.88	1 80	1.08	1.89	0.90	1.04	3.60	5.72	34.75
1890	76.4	78.0	71.2	62.7	54.0	44.0	33.8	28.9	32.8	32.6	54 9	60.1	52.45	3.41	2.49	1.77	4 46	2.44	1.87	0 03	1.81	1.09	2.43	1.79	3.34	26.97
1891	71.5	.....	.....	.....	.....	.....	.....	31.6	29.7	31.1	54.0	60.5	.....	3.66	.....	.....	.....	.....	.....	.....	2.59	1.32	2.27	5.06	2.56	.....

METEOROLOGICAL TABLES—Continued.

1874—OMAHA*—1890.

Latitude, 61° 0′ N.; longitude, 96° 0′ W. Elevation above sea level, 1,113 feet.

YEARS.	COMPARATIVE MEAN TEMPERATURE (DEGREES).													COMPARATIVE PRECIPITATION (INCHES).											
	June.	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	Average mean for year.	June.	July.	August.	September.	October.	November.	December.	January.	February.	March.	April.	May.	Total for year.
1874	73.1	79.6	77.2	62.7	53.6	36.0	28.2	29.2	23.0	35.1	44.7	66.1	49.12	6.93	0.54	2.08	7.18	1.45	1.05	0.54	0.32	0.92	1.49	2.01	1.34	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	47.18	10.95	10.01	7.77	2.55	1.16	3.13	1.90	0.26	0.51	1.24	3.06	4.25	39.89
1876	68.2	75.2	74.9	62.2	49.9	35.1	19.0	26.7	30.4	29.2	51.1	63.0	48.51	3.47	7.30	6.27	4.93	0.69	1.17	0.16	0.20	0.40	3.18	2.65	2.07	32.51
1877	69.1	75.6	72.6	66.4	51.2	36.0	38.9	29.2	27.3	33.9	30.1	69.3	50.96	8.30	0.96	3.13	2.65	5.86	2.14	0.33	0.44	1.36	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	52.00	8.48	7.06	2.48	3.22	0.55	0.29	0.97	1.23	0.14	3.09	3.97	5.77	37.65
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	50.96	4.09	3.17	1.51	1.43	3.64	4.35	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	36.4	18.4	34.5	30.9	35.9	51.2	69.4	50.22	3.14	5.36	7.10	2.91	3.54	1.70	0.28	0.90	0.14	0.50	0.55	3.40	29.32
1881	74.9	78.9	80.2	66.0	54.4	36.9	36.0	11.8	17.0	27.6	44.4	67.8	50.56	5.56	5.80	1.65	8.36	4.84	1.39	1.66	0.61	3.09	0.82	4.25	7.94	45.75
1882	71.0	71.7	73.1	67.5	57.2	39.7	24.6	27.5	26.3	40.2	52.0	66.6	51.11	12.05	6.76	0.45	0.51	5.09	1.42	0.92	0.74	6.60	0.79	5.91	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	47.76	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	48.36	6.11	10.35	7.07	4.91	3.81	0.32	0.72	0.73	1.42	4.91	3.88	1.45	47.09
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	47.47	2.67	9.24	6.99	2.50	3.86	0.73	1.17	0.41	0.47	0.33	0.34	4.43	33.44
1886	70.2	77.3	75.6	65.1	58.3	34.3	17.9	11.9	24.4	31.9	60.9	65.1	48.82	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	72.0	65.3	50.7	39.6	25.6	11.8	18.2	28.0	54.5	66.1	48.85	4.56	2.02	3.94	2.44	0.72	0.89	1.11	0.49	1.00	0.48	0.88	1.39	19.92
1888	70.0	77.6	70.3	61.3	48.4	36.7	30.4	8.0	25.9	28.8	52.5	65.9	47.15	3.86	2.56	3.44	0.24	1.19	0.12	0.96	0.58	0.74	4.25	2.05	4.36	26.88
1889	68.7	74.8	74.6	63.6	52.2	35.3	39.4	22.8	21.1	40.2	52.4	61.6	50.5	5.44	4.94	2.90	1.74	0.34	0.87	0.90	1.62	0.53	0.53	1.19	2.07	22.57
1890	74.0	78.8	70.5	63.7	52.0	42.0	35.0	18.0	25.0	33.0	55.0	66.0	50.58	5.04	3.74	1.02	2.50	1.09	1.01	0.08	2.11	1.62	0.54	1.95	1.55	22.08
1891	69.0							30.0	20.0	29.0	54.0	59.0		6.66												

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

Temperature and Rain-fall for Forty-five Years.

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:

MONTHS.	MEAN TEMPERATURE, DEGREES F.				RAIN-FALL IN INCHES.			
	I.	II.	III.	Month.	I.	II.	III.	Month.
January	.52	.60	.60	1.72	18.7	19.1	20.5	19.4
February	.55	.55	.70	1.80	22.0	24.4	27.1	24.4
March	.80	.95	1.10	2.85	29.6	32.2	37.3	33.1
April	1.20	1.20	1.10	3.50	43.3	47.9	51.6	47.6
May	1.20	1.20	1.35	3.75	55.5	60.0	63.8	59.9
June	1.65	1.65	1.55	4.85	66.3	68.8	71.8	69.0
July	1.65	1.27	1.20	4.12	73.7	74.1	73.8	73.9
August	1.42	1.65	1.85	4.92	73.1	71.8	69.6	71.2
September	1.80	1.55	1.25	4.60	66.4	62.9	59.4	62.9
October	1.10	.95	.90	2.95	55.0	50.3	45.1	49.9
November	.95	.82	.70	2.47	40.7	35.8	29.2	35.3
December	.60	.50	.50	1.60	26.3	23.2	20.2	23.1
Total for the year--mean				39.13				47.47

RAIN-FALL FOR FORTY-FIVE YEARS.

The following is a record of the rain-fall in Iowa for a period of forty-four years, as observed at Muscatine, Iowa, by J. P. Walton, Rev. J. Ufford, S. Foster and Prof. T. S. Parvin, voluntary and Smithsonian observers:

Year.	Inches.	Year.	Inches.	Year.	Inches.	Year.	Inches.	Year.	Inches.	Year.	Inches.	Year.	Inches.	Year.	Inches.	Year.	Inches.
1846	34.55	1851	74.50	1856	41.94	1861	44.25	1866	32.80	1871	36.11	1876	53.57	1881	45.66	1886	31.92
1847	28.50	1852	59.39	1857	34.85	1862	55.16	1867	32.24	1872	35.44	1877	44.78	1882	46.67	1887	28.30
1848	39.62	1853	44 92	1858	58.45	1863	26.83	1868	40.91	1873	28.42	1878	39.30	1883	41.12	1888	38.89
1849	59.16	1854	24.66	1859	35.90	1864	33.77	1869	43.56	1874	34.78	1879	33.83	1884	45.49	1889	33.47
1850	49.08	1855	31.13	1860	25.10	1865	34.21	1870	24.61	1875	37.59	1880	35.78	1885	39.14	1890	31.87
Mean for the forty-four years																	39.27

MEAN FOR EACH MONTH DURING THE FORTY-FIVE YEARS.

January	1.92	March	2.71	May	4.46	July	3.95	Sept.	3.80	Nov.	2.54
February	2.08	April	3.37	June	4.78	August	4.40	October	3.04	Dec.	2.35

DECISIONS OF THE SUPREME COURT.

NUSIANCE—PUBLIC AND PRIVATE—POWERS OF LOCAL BOARDS THEREIN.

KALSSEN, *vs.* WILSON.

Appeal from Benton District Court.

An action is mandamus to compel defendants, who constitute the School Board of the Independent District of Belle Plaine, acting as a board of health, to remove a privy, situated on the school-house grounds.

The petition of plaintiff sets forth that the city council, sitting as a Board of Health, had declared the privy a nuisance, and ordered it to be removed. The proceedings were set forth in the name of the city council. The defendant demurred to the petition on the ground that a city council had no power to abate a nuisance; that the plaintiff had not established any right of action against defendants, nor shown any proof of injury sustained by refusal of defendants to remove the privy; that the remedy of the plaintiff was in law, and not in equity proceedings. The court below sustained the demurrer, generally.

BECK, J.—I. The petition alleges that the defendants constitute the school board of the independent district of Belle Plaine, which maintains a large privy for the use of the school on, or near public streets of the city, and just across the street from plaintiff's residence, and in plain view thereof; that the city council, as a board of health, declared the privy to be a nuisance, and dangerous to the public health, and ordered its removal.

Plaintiff alleges that the privy is "unsightly," and that he has sustained injury resulting in damage by reason of the refusal of defendant to remove it. He does not allege that it is a nuisance in fact, nor point out the cause or source of injury sustained by him on account of the failure of defendants to remove the privy.

II. Surely, the order of the city council, as the board of health, declaring the structure a nuisance and dangerous to the public health, is not conclusive, as between plaintiff and defendant, and bestows him no rights which he may enforce by action against defendants, without establishing such right by proof, showing the privy to be a nuisance working injury to plaintiff's property.

It must be remembered that neither the city board of health nor the school district, is attempting to enforce the order of the board of health, based upon its adjudication that the structure is "dangerous to the public health." Nor does the plaintiff in this case for the public seek to enforce the order of the board of health for the protection of the public health, but as we understand the abstract, he seeks to enforce the order on the ground that the objectionable structure is "unsightly" and situated "just across the street" from his own residence.

The grounds upon which plaintiff seeks to enforce the order are not for the protection of the public, but for the protection of his personal rights, and the recovery of damages for their violation. The board of health was not created by statute to protect and enforce private rights, and to provide a remedy to recover damages for the deprivation of such rights. Their orders are to be made and enforced for the protection of the public health.

Plaintiff mistakenly sought to enforce a remedy for an individual injury by this proceeding in mandamus; to require obedience to the order of the board of health.

The district court rightly sustained the demurrer to plaintiff's petition.

80 Iowa, 229. AFFIRMED.

In the case of *Bushnell vs. Robinson*, 62 Iowa, 540, the supreme court says: "One cannot erect a nuisance upon his land, adjoining land owned by another, and thus measureably control the use to which his neighbor's land may, in future, be subjected."

STATE *vs.* W. S. SMITH.

MAY TERM, 1891.

Appeal from Tama District Court.

The defendant was tried and convicted for the crime of nuisance committed by polluting the water in Iowa river in Tama county, and from a judgment imposing a fine this appeal was taken.

J. L. Carney, for appellant.
John Y. Stone, Attorney-General.
J. R. Caldwell, County Attorney of Tama County.
Thomas A. Cheshire, for the State.

ROTHROCK, J.—I. The defendant demurred to the indictment. The demurrer was overruled. The sufficiency of the indictment is therefore the first question proper to be determined, and it is necessary to set out the instrument. It is in this language:

Decisions of the Supreme Court.

"The said W. S. Smith, on the first day of January, A. D., 1889, and on divers days and times since, and up to the time of the finding of this indictment, wrongfully and unlawfully did commit, place, deposit, discharge, and run into, and cause to be committed, deposited, discharged, and run into a certain creek and stream of water situated in the county of Marshall and State of Iowa, known as Linn creek, a large quantity, to-wit: one hundred tons of cattle manure, filth, offal, glucose, acids, sulphuric acid, sulphur and other poisonous substances, the names of which are unknown to the grand jury; and that by the natural and usual flow of the waters of the said Linn creek and stream, all of said manure, filth, offal, glucose, acid, sulphuric acid, sulphur, and other poisonous substances, the names of which are unknown to the grand jury as aforesaid, were at said time carried into the waters of the Iowa river, and by the natural and usual flowing of the waters of the Iowa river, all of the said manure, filth, offal, glucose, acids, sulphuric acid, sulphur, and other poisonous substances, the names of which are unknown to the grand jury, were at the said time carried into the waters of the Iowa river in the county of Tama, and State of Iowa, whereby, and by reason whereof, the waters of said Iowa river in the county of Tama, State of Iowa aforesaid, and at the time aforesaid, became and were corrupted, rendered unwholesome, and impure, to the injury and prejudice of A. B. Taplin, B. F. Hill, Nathan Hall, and other persons then residing along said river in said county of Tama, State of Iowa aforesaid, contrary to, and in violation of the law."

It is claimed by counsel for appellant that this instrument does not charge an indictable offense. It is said that the indictment is fatally defective because it does not charge that the offense committed was a public nuisance. That it does not appear that the acts of the defendant were injurious to any persons except the three individuals named in the indictment.

It is as sufficient to this objection to say that, by section 4089 of the Code, "The corrupting or rendering unwholsome or impure, the waters of any river, stream or pond," is a nuisance, and when it is charged that it is to the injury and prejudice of certain persons and others living along said stream, it is sufficient to constitute a public or common nuisance. This charge is directly made in the instrument in this case, and we think it fully meets the requirements of the rule, as stated in *State vs. Kurtee*, 35 Iowa, 221, and *State vs. Cloed*, 35 id., 570.

II. It is further claimed that the indictment shows upon its face that the district court of Tama county had no jurisdiction, for the reason that if the defendant was guilty of any offense it was committed in Marshall county. This is the question in the case, and it was made all through the trial, and is insisted upon now with great apparent confidence. The facts, as disclosed by the evidence, correspond with the averments of the indictment so far as they relate to the place where the defendant committed the acts claimed to be an offense. It does not appear that he did any overt act in Tama county, but that if the water in the river was polluted by the defendant, it was the consequence of acts done by him in Marshall county. It is true, in a general way, that the local jurisdiction of the district court,

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in criminal cases, is confined to the county in which the court is held. But this is not true in all cases. It is provided by section 4156 of the Code, that "The local jurisdiction of the district court is of offenses committed within the county in which it is held, and of such other cases as are, or may be provided by law." And section 4159 provides "That when a public offense is committed part in one county, and part within another, or where the acts or effects constituting a requisite to the consummation of the offense occur in two or more counties, jurisdiction is in either county."

This provision of the statute appears to us to be decisive of the question of jurisdiction. It is plain that just such offenses as this are contemplated and provided for by this act, and the act has been in force many years. See Code of 1851, section 2806.

The case of *In re Eldred and Ford*, 46 Wis., 530, relied upon by counsel for appellant, is not in point. That was a complaint for maintaining a dam in a stream in one county which backed the water of the stream across the line into another county. It was held that an indictment would not lie in the county other than that in which the dam was located. But the decision in that case was placed upon the ground that there was no statute in Wisconsin providing for such a case.

On the other hand, in the case of *State vs. Lord*, 76 N. H., 357, it was held that where a dam was erected in a stream in the State of Maine, the back water from which obstructed a public highway in New Hampshire, an indictment for nuisance would lie in the last named State. See, also, *Comm. vs McCloon et als.*, 701 Mass., 1 and 4 *B.; B and Ald.*, 95, and *Thompson vs. Crocker*, 9th Pickering, 59.

III. The evidence tends to show that the defendant is employed by the Firmeinch Manufacturing Company, in and about a glucose factory, situated at the city of Marshalltown, and that the offal from said factory, and the waste from yards where large numbers of cattle were fed, were discharged into a small stream called Linn creek. This is tributary to the Iowa river, and empties into that stream within Marshall county, and some four miles from Marshalltown. The evidence shows quite conclusively that above the confluence of the two streams, the water in the river was pure, and free from obnoxious smells, and that below the junction of the streams, the water in the river was polluted, and so impure that many of the fish in the stream died, and that this pollution was plainly manifest as far down the river as Tama City, in Tama county. It also appears in evidence that the sewers, from a large part of the city of Marshalltown, emptied the sewage from the city into Linn creek, above the glucose manufactory; and there were, also, one or more slaughter-houses situated on said stream, the offal and refuse from which was thrown into the creek.

It is contended that the defendant is not liable if he merely contributed to the contamination of the water which emptied from the creek into the river. The court took the opposite view, and charged the jury that the defendant was guilty if he contributed to rendering the water impure, corrupt and unwholesome.

The evidence tends strongly to show that there was no observable impurity in the water in the river in Tama county until after the glucose factory commenced to waste the refuse from it and the cattle yards into Linn creek. But, however this may be, if the defendant contributed to the pollution of the water, it is a fundamental principle of the law, that he is guilty of the nusiance, otherwise no prosecution could be maintained against any one for the offense.

IV. It is claimed that the defendant is not responsible for the pollution of the water in the river, because he was a mere employe of the manufactory, and had no control thereof, as a superintendent, or otherwise, and that he had no knowledge of the effect of wasting the refuse in the creek. It is to be conceded that the testimony as to the defendant's control of the manufactory is not at all conclusive, but we think it was sufficient to sustain the verdict, and as to the knowledge, if that be conceded to be necessary, a point which we do not determine, we think that the pollution of the waters of the creek and the river, was so apparent that all persons engaged in emptying refuse matter therein, should be held to have notice of the effect of these acts.

V. It is said that the seventeenth paragraph of the charge to the jury is confused, and misleading. It is to be confessed that it is not as clear and concise as it might have been made, but we think, in view of the other paragraphs of the charge, it was not misleading, nor prejudicial. We need not set it out at length.

VI. Other questions are made by counsel relating to alleged errors in the admission and exclusion of evidence, and to the alleged misconduct of one of the counsel for the State in his address to the jury. We need not notice these objections in detail. It appears to us that they do not demand especial consideration. We do not discover any error in them. And the motion to strike appellee's abstract from the files, will be overruled. The judgment of the district court is AFFIRMED.

EXPENSES OF SMALL POX.

L. O. SANDERSON, *vs.* CERRO GORDO COUNTY.

Appeal from Cerro Gordo District Court.

The plaintiffs are the trustees and the clerk of Grant township, in the defendant county, and by virtue of their offices, they constitute the board of health, of said township. The petition shows that in August, 1886, certain inhabitants in said township, were infected with small pox, to the extent that the public health of the township was in danger; that to make suitable provisions against such danger, the plaintiffs, as a board of health, appointed one J. R. Jones, as a physician for the board, and directed him to take

charge of the matter, and adopt such measures as he thought suitable, to prevent the spread of the disease; that said Jones, in the performance of said duty, rendered services to the value $170.50; that the plaintiffs in their capacity as trustees and clerk of said township, levied a tax of $300 on the taxable property of the township, in September, 1886, for the use of said board of health in small pox matters, which was collected by the treasurer of the county, and paid over to said Grant township; that on November 1, 1886, the board of health paid from the money so raised, the amount due said Jones, that the claim therefor was filed with the board of supervisors of the defendant county, and by it refused.

The petition avers that the plaintiffs are entitled to recover the amount for the use of the board of health of said township, and asks judgment accordingly.

To the petition a demurrer was filed, and among other grounds, it is urged that the plaintiffs are not proper parties to maintain the suit.

The district court sustained the demurrer, and from a judgment for the defendant, the plaintiffs appealed.

GRANGER, J. We deem it unnecessary to refer to more than one ground of demurrer, as it seems decisive of the case.

There is no pretense, but—in fact it is expressly urged—that the suit is by the plaintiffs in their official capacity for the "use and benefit of the township, or for the local board of health."

The action is at law, and we must look to the provisions of the statute for a recognition of their right to bring the suit. Appellants do not attempt to point out a section of the statute, or a decision, as authority for this proceeding, except the case of *Long vs. Emsley*, 57 Iowa, 13, wherein it was held that a township clerk could maintain a suit to recover money to which he was entitled by virtue of his office, such as road funds, but the facts in this case are widely different. We know of no law giving the plaintiffs the right to receive and hold the funds in question, conceding the liability of the county for its payment.

Code, section 2543, provides that every action must be prosecuted in the name of the real party in interest, except as provided in the next section."

It is plain the plaintiffs are prosecuting the suit in a representative capacity, and we inquire if they come within the exceptions of section 2544. It provides: "An executor, or administrator, a guardian, a trustee of an express trust, a party with whom, or in whose name, a contract is made for the benefit of another, or a party expressly authorized by statute, may sue in his own name, without joining with him the party for whose benefit the suit is prosecuted."

With all that appellants claim, the township, or the board of health, must be held as the real party in interest. Appellants say that the local board * * * have a trust capacity, which entitles them to act." If it is true that they have, as to the funds in question—which we must not be understood as holding—still, it is not an express trust, but one clearly

arising by implication, and the plaintiffs are not within the provisions of the statute.

We think it unnecessary to elaborate, and the judgment of the district is AFFIRMED.

80 Iowa, 89.

DECISIONS OF THE ATTORNEY GENERAL.

POLLUTION OF RIVERS.

OFFICE OF ATTORNEY-GENERAL,
DES MOINES, July 30, 1889.

DR. J. F. KENNEDY, *Secretary State Board of Health:*

SIR—I am in receipt of your communication and accompanying papers concerning the pollution of the waters of the Iowa river, caused by emptying refuse matter from a factory in Marshalltown, into that stream, the effect of which is imperiling the health and lives of persons living on or near that river. I note your inquiry as to what means should be adopted to put a stop to this condition of things.

The legislature of Iowa, under its admitted powers, has made ample provision for an emergency such as this. Below I quote from chapter 151, of the acts of the twentieth general assembly:

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. 13. The mayor and aldermen of each incorporated city, the mayor and council of any incorporated town or village in the State, or the 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. 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 ($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 remove 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 neglect 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. 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 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.

It will thus appear from these sections, which are so clear as to need no interpretation, that the local board of health, composed of the mayor and aldermen of the city of Marshalltown, where this factory is situated, have ample power to bring to a sudden termination the causes which are producing this wide-spread danger along the Iowa river. If this local board of health at one of its meetings should, upon investigation, find and determine that the emptying of this refuse matter into the river, or into any passage way which conducted it into the river, was causing a nuisance dangerous to health and life, or that such refuse matter was being disposed of in any other such way as to cause such a nuisance, and the board should make a record of that fact, and should order the owner of the property, place or building, to remove the nuisance or cause of sickness within twenty-four hours, or such other time as it deemed reasonable, after notice was served in accordance with the statute, and the owner or occupant should fail to comply with such order, then the board could lawfully make another order directing the removal of the nuisance or cause of sickness, and provide that the expense thereof should be paid by the owner, occupant, or other person, who caused or permitted the objectionable conditions. This local

board could then take such reasonable steps as it deemed proper, to summarily and promptly execute this order, and the expense of the same could afterward be recovered against the party whose duty it was in the first instance, to remove the nuisance or cause of sickness.

Of course, it would readily occur to the board that this work of removal, or prevention, should be executed with as little damage as possible to the owner of the property or others, consistent with the imperative demand of safety to the lives and health of the inhabitants. But the controlling motive must be this safety, and to the extent that the objectionable conditions threaten it. To that extent they must be removed or prevented, whatever the consequence to individuals may be.

A close examination of the sections I have quoted, and particularly sections thirteen, seventeen and eighteen, will point out to the local board the line of their duty, and the method of its execution. It is undoubtedly the intention of the provisions contained in section seventeen, above quoted, to leave it to the owner or occupant to cause this removal or prevention with as little injury to himself as possible, and to leave it to him to determine what method he will adopt, requiring only that this method shall be effectual. If he fails to act within the time designated, then the board must act.

In construing a Massachusetts statute, precisely similar to ours, the supreme court of that State, in the case of *The City of Salem vs. Eastern Railway Company*, 98, Mass., 443, in speaking of the powers of the boards of health, say:

> Their action is intended to be prompt and summary. They are clothed with extraordinary powers for the protection of the community from noxious influences affecting life and health, and it is important that their proceedings should be embarrassed and delayed as little as possible by the necessary observance of formalities. Although notice and opportunity to be heard upon matters affecting private interests ought always to be given when practicable, yet the nature and object of those proceedings are such that it is deemed to be most for the general good that notice should not be essential to the right of the board to act for the public safety. Delay for the purpose of giving notice, involving either of public notice or of inquiry to ascertain who are the parties whose interests will be affected, and further delay for such hearings as the parties may think necessary for the protection of their interests, might defeat all beneficial results from an attempt to exercise the powers conferred upon boards of health. The necessity of the case, and the importance of the public interests at stake, justify the omission of notice to the individual.
>
> The adjudication of the board that a nuisance exists is conclusive, and no appeal lies therefrom.
>
> The board of health should be careful to keep a full and accurate record of its proceedings. All jurisdictional requirements should be stated in the record, and the finding of facts should be clearly stated therein. The adjudication of the fact of a nuisance should clearly appear, and all the orders and adjudications of the board should be stated in unmistakable language.
>
> The power of the board of health is extraordinary, and its exercise may result disastrously to individual interest; but the emergencies that confront the board are very great, involving the destruction of health and life. In this conflict, individual interest must yield, and the public welfare have sway.
>
> Other legal methods can be employed that would correct the evil in time, but the one pointed out in this opinion is the most prompt and efficacious of all.

JOHN Y. STONE,
Attorney-General.

RABID DOGS.

STATE OF IOWA, OFFICE OF ATTORNEY-GENERAL,
DES MOINES, July 10, 1891.

MR. W. G. ROSS, *County Attorney, Fairfield, Iowa.*

DEAR SIR—I am in receipt of yours of the 23d ult., in which you ask my opinion on the following question:

Have township trustees acting as local boards of health, or otherwise, power to require all dogs found in the township to be muzzled or kept on the premises of the owner, under penalty of being shot?

The portions of the statute which define the powers and duties of the local boards of health are section 16 of chapter 151 of the acts of the eighteenth general assembly, and section 415 of the Code, first adopted by chapter 107, acts of the eleventh general assembly. This latter section reads as follows:

> The township trustees shall have power to make whatever regulations they may deem necessary for the protection of the public health, and respecting nuisances, sources of filth, and causes of sickness within their respective townships.

By this act, the township trustees are not created local boards of health by that name, although they are given ample powers as such. Chapter 151, eighteenth general assembly, is the one which creates the State Board of Health, giving that body general and paramount jurisdiction of health matters (Sec. 2), creating by name city and town councils and township boards, local boards of health (Sec. 13) subordinate to the State Board (Sec. 15) and defining their powers as follows (Sec. 16): "Local boards of health shall make such regulations respecting nuisances, sources of filth, and cause of sickness within their jurisdiction, * * as they shall judge necessary for the public health and safety."

Section 25 of the act repeals all laws in conflict with it.

Such being the law, what are the powers of a board of township trustees with reference to protecting citizens within their jurisdiction from mad dogs by reasonable regulations? I think it may be questioned whether section 12 of chapter 151, acts of eighteenth general assemby gives them any such power. By it they may make regulations "respecting nuisances, sources of filth and causes of sickness," but concerning nothing else. At a casual glance it might be seen that mad dogs, being "causes of sickness,"

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viz.: of the disease rabies, might be regulated, but this position is questionable, for it is a well known rule in the interpretation of statutes that when general words follow a list of particular ones, the meaning of the general words is restricted to things of the same genus or kind as those before enumerated. (Sutherland on Statutory Construction, Sec. 268.)

The particular words being "nuisances and sources of filth," the "causes of sickness" that local boards of health have power to regulate are only those which are of the same general kind. Mad dogs are not nuisances in the ordinary legal acceptation of the term.

Section 415, however, gives, in my opinion, unquestionably the authority to restrain and regulate mad dogs to township boards. Its provisions are amply broad, the first clause giving board of trustees the power "to make whatever regulations they deem necessary for the protection of the public health." The remaining part of the section is virtually the same as the later statute, section 16, above quoted. Certainly such a regulation of dogs as you suggest, would be a regulation which might be deemed necessary for the protection of the public health. I am, therefore, of the opinion that township trustees may adopt and put in force such a regulation. A substantially similar power is given city and town councils by another statute, section 459 of the Code.

It is true, that it may be contended that since chapter 151, twenty-first general assembly is manifestly intended to cover the whole subject of health regulations, that, therefore, the previously existing statutes on the subject, including section 415, have been supplanted and repealed by it. But repeals by implication are not favored. Statutes passed at different times and referring to the same subject are, if possible, construed together as one statute, and all the provisions of such given effect. The fact that there is an express repealing clause in chapter 151, does not affect the matter, for it provides only that "acts in conflict with this act are repealed." The general provision of section 415, that "township boards may pass whatever regulations they may deem necessary for the protection of the public health," is in conflict with no part of chapter 151. Further, it seems to me, that manifest reasons of public utility and safety would forbid the interpretation that the legislature intended to leave country districts without the power to protect themselves that is expressly granted to cities and towns.

Yours truly,

JOHN Y. STONE,
Attorney-General.

COUNCIL BLUFFS, IOWA, August 10, 1891.

O. C. Brown, Esq., County Attorney, Indianola, Iowa:

DEAR SIR:—I am in receipt of yours of July 30th, in which you state that a mad dog has bitten a number of cattle and horses in your county, some of which have gone mad, and others have been quarantined; that the owners are unwilling to kill the suspected animals, and asking what the powers and duties of the State Board of Health and the township trustees, acting as a local board of health, are in the premises.

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There is no provision in the statute providing for the destruction of such animals and the compensation of the owners therefor, as there is in the case of glandered horses. The State Veterinary Surgeon is in all probability right in thinking that he has no jurisdiction. If then, the power to remedy this evil is vested in any office or body, it is in the State Board of Health, or the local board of health, under the following quoted provisions of the law: The State Board of Health has, by virtue of chapter 151 of the acts of the eighteenth general assembly, the charge of all matters pertaining to quarantining, and "authority to make such rules and regulations as they may deem necessary for the preservation and improvement of the public health." The police officers of the State are required to aid in the enforcement of such rules and regulations. The township boards of trustees, acting as local boards of health, are by virtue of section 415 of the Code, given substantially similar power. "They have the power to make whatever regulations they may deem necessary for the preservation of the public health." Sections 418 and 419 provide that the board shall have power to employ persons to carry into effect regulations adopted by them, and that a violation of any of the rules shall constitute a misdemeanor and be punishable as such.

These powers are general and broad, and there seems to be no limit to their exercise, providing they do not trench upon or conflict with the constitution or laws of the State. Any rule or regulation which the State board, or the local board might, in their exercise of their official discretion, deem necessary for the preservation of the public health, would, I think, be *prima facie* valid at least. The question as to whether any particular regulation, such as the one aimed at the evil referred to in your letter, is necessary and therefore valid, would be a matter for the official discretion of the board passing the regulation.

The further question as to whether there would be any review by the courts, or otherwise of this discretion, is one that in the present state of judicial decisions, I am unable to venture an opinion on. The law seems to have vested the State board with wider powers in such matters than the local boards, but has not provided as efficient means for the enforcement of the regulations adopted by it as it has in the case of the local boards.

Yours truly,

(Signed) JOHN Y. STONE,
Attorney-General

DECISIONS OF THE STATE BOARD.

LOCAL BOARDS.

1. Must there be some formal regulations adopted and made of record by a local board of health, and published before they are enforceable?
2. Are regulations made by the State Board of Health, binding upon local boards, without further endorsement by local boards?
3. Can a local board, or any member thereof, proceed to "isolate," "order," "regulate," or make "efficient provision," without a formal meeting and action as a body? Can they act verbally, as each case arises, according to its own circumstances, or must there be some formal record action, as a body, first taken?

ANSWER. 1. Regulations must be formally adopted and made of record by a local board of health They should be prepared in the form of rules or ordinances, and cover all the ground deemed necessary to carry out the intent and purpose of the law, and object of the board.

2. The Attorney-general says, "I think it is the purpose of the law to give the State Board superior control over all matters relating to public health. Local boards have the power, and are required within their respective jurisdictions, in case epidemic disease is developed, to take such measures as may be deemed necessary for the safety of the inhabitants. See section 22, chapter 151, of the acts of the eighteenth general assembly. But even the local board has no authority to do away with the restrictions that have been previously established by the State Board, nor any right or authority to change a condition with respect to a patient, that had been established under the regulations of the State Board. The object of the law is to furnish methods, means or agencies, for preserving and protecting life and health. The State Board is invested with power in this matter, extending over the whole State. It is the duty of all persons to observe the regulations it has established, because in legal contemplation, as well as in fact, they have been established for the public good.

3. A local board of health under chapter 151, laws of 1880, can not delegate its powers to a committee, nor to any person. The statute provides for meetings of the board at any time that the necessities of the health of

their respective jurisdictions may demand. They must meet as a board and act as a unit, as each case arises, according to its own circumstances, and make such regulations as may be deemed necessary to the protection of the public health. This action must be of record; (*Young vs. Black Hawk County*, 64 Iowa, 460). A local board can not delegate its descretionary powers to a committee, nor to its health officer.

When the council of a city, or incorporated town, adopts health regulations as ordinances, such regulations, and the enforcement of them would come within the purview of the law governing the corporation. If the local board of a city or town adopt health regulations under the provisions of chapter 151, laws of 1880, the council of such city or town, may enforce such regulations by an ordinance providing a penalty for violations of such regulations. (*State vs. Holcomb*, 68 Iowa, 107).

Has local board the right to return children who come from a family in another town, where one died from malignant diphtheria, and another was sick when they left?

ANS. No. The statute prohibits the placing upon any railroad car, or other public conveyance, any person infected with a contagious disease. They must be cared for and quarantined where they are.

What shall be done with physicians who neglect or refuse to report contagious diseases occurring in their practice to the local board?

ANS. They should be prosecuted. A city or town, may by an ordinance provide a fine as penalty for the violation of regulations made by the local board of health.

Does the health law apply only to cities and towns?

ANS. In plain, unmistakeable language, it applies to every city, town and township in the State of Iowa.

Is it the design of the State Board that membraneous croup shall be quarantined the same as diphtheria?

ANS. Yes.

Where butter is made in a small room detached from the living room of a family in which is diphtheria, and the family and friends are consfantly having more or less to do with the butter making, what shall be done with the butter?

ANS. The local board should peremptorily prevent its sale or use.

Where milk and cream is gathered for a creamery from a house in which there is scarlet fever, what should be done?

ANS. The gathering of cream should be stopped, and the premises quarantined. Milk is one of the greatest absorbents of contagion known.

Where a contagious disease exists in a State institution, has the local board power to place danger cards or signals on such institutions, or to quarantine them?

ANS. Yes, emphatically, and it is their duty to do so. The statute makes no distinction between State institutions and the premises of private citizens.

Decisions of the State Board.

Where an incorporated town is within a township, a contagious disease appears within the town, the local board of the town takes no action regarding such disease, and does nothing to suppress it, can the local board of the township take action thereon?

ANS. A local board of health has no jurisdiction beyond the town, city or township of which it is the board. In the case put, the township board would have no jurisdiction within the town, and *vice versa*. But the township board may protect its community by quarantine against the town, and take such measures as may be deemed necessary to protect its community from exposure. The local board of the town may be compelled, by proceedings in *mandamus*, to perform their official duty in the premises.

1. Can the mayor and aldermen of a city, at a meeting of the council, fix the compensation of, and elect a health officer?
2. Is it necessary that the council organize as a board of health before they elect a health officer, and fix the compensation he shall receive?
3. Where a city council has for several years, at regular meetings of the council, elected a health officer and fixed his compensation, and thus transacted all other business pertaining to the board of health, and the record of such proceedings have been kept as a part of the records of the council, is such action legal? Has the council conformed to the statute? Would orders and regulations, emanating from such action be legal?
4. Must the records of a local board of health be kept in a separate book?

ANS.—1. No. A city council is governed by the laws of municipal corporations. A local board of health is governed by a special statute. A city council and a local board of health in legal contemplation are separate bodies, and have distinct functions and duties under the different statutes creating them. Neither can act in the name of the other.

2. Yes.

3. No. The election of a health officer of a local board must be in accordance with the provisions of section 14, chapter 151, laws of 1880. The same section also provides that a local board of health shall fix the compensation of all persons employed by them in the execution of the health laws, and of their own regulations. The supreme court says that when the statute requires certain duties to be performed by public officers, it can be done in no other way nor by any other person.

An exception to this rule, would be where a city or town council adopted health regulations as ordinances, in which case proceedings could be had under their corporate powers.

4. The records of a local board, under chapter 151, laws of 1880, must be kept separate, except as set forth in the answer to interrogatory three.

Can a local board of health, at a regular recorded meeting, delegate to the health officer power to establish or release quarantine at his pleasure?

ANS. No. The board may direct the health officer to execute an order of the board to establish or release quarantine, but the discretionary power to make the order is vested in the local board.

Is it sufficient if a local board adopt a resolution declaring that all regulations made by the State board, regarding contagious diseases, shall be the rules of such local board?

Decisions of the State Board.

ANS. Yes, provided the regulations are specifically set forth, and made of record by the local board.

It is claimed by our attorney that the rules and regulations of the State board, Form 13 B, are simply recommended to local boards for their adoption, and are, therefore, not of binding force upon the people as regulations of the State board.

ANS. The regulations referred to were adopted by the State board, and officially declared, as made by the board. They are also recommended for adoption by local boards for the purpose of giving them all the efficiency under any specific authority which local boards may have, and not possessed by the State board, as in the case of city and town councils.

Has a local board power to make regulations requiring dogs running at large to be muzzled, and ordering dogs not muzzled to be shot?

ANS. Local boards have the power to make such regulations as are deemed necessary to protect the life and health of the people in their jurisdiction. Rabies is an infectious, and fatal disease, and a local board can make such regulations as they deem best to prevent it. To require all dogs running at large, to be muzzled, is in the nature of quarantine. As there might be a question as to the power of a local board, to provide penalties, it would be better, for the city or town council by an ordinance, to provide that all dogs found running at large without a muzzle, in violation of regulations of the local board, shall be shot. This the council may do.

A few weeks ago a rabid dog appeared in this community and several cows and hogs were bitten by it. Some of the animals have since died. One farmer had nine hogs bitten. What should be done with these animals? Should they all be killed? The owners claim they cannot afford to lose them. If required to kill them can they recover compensation therefor?

ANS. Animals bitten by a rabid animal do not always become infected with rabies; hence it is not necessary to kill an animal so bitten, but all animals known to have been bitten should be kept under strict surveillance, so as to prevent danger to other animals. There is no provision of law whereby compensation can be recovered from public funds for animals killed in such cases. Recovery could be had from the owner of the dog, if it could be shown that he permitted the animal to run at large, knowing it to be rabid. The supreme court says that section 1485 of the Code, imposes liability upon the owners of dogs for all injuries done by them.

It is pertinent here to direct the attention of local boards to the importance of performing their duties as public officers, in making such regulations as will protect their jurisdiction against rabid dogs, by requiring all dogs running at large to be securely muzzled, supplemented in cities and towns by an ordinance that all dogs found running at large within the limits of the city or town between certain fixed dates shall be shot. It is folly to wait until some rabid animal has caused serious loss of life and property.

It is claimed by a member of our local board that the health officer has no authority to order a nuisance abated, as for instance, to clean up a hog pen, or remove filth from premises, etc.; that he has only authority to make sanitary investigations and report to the board, and that the board must convene for the consideration of each and every complaint, or that they must be

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in session to consider such complaints. That complaints made *ad interim* must lie over until a meeting of the board is had.

ANS. The remedy for the difficulty presented is simple. It is only necessary for a local board to provide by general regulations that within the jurisdiction of the board no hog pens shall be kept within a certain distance from any dwelling house, and that they shall be cleaned once each week, between May and November, and shall be kept clean. This may be supplemented in a city or town with an ordinance providing that any violation of regulations made by the local board of health shall be deemed a misdemeanor, and be punished by a fine of not less than twenty-five dollars. In case of quarantine for contagious disease, the supreme court seems to make the distinction that the statute requires the local board to meet in each case and make such regulations as are necessary therein; that no member of a board, nor the health officer can establish quarantine. When regulations have been made and promulgated by a local board, the board may direct the health officer or a peace officer to enforce them.

In the organization of a local board, must it be done by resolution, or by ordinance?

ANS. Local boards are already organized by statute. It is only necessary to elect a president and health officer and proceed to business. All proceedings of the board should be reduced to writing and made of record.

Has a local board of health any further duty after a quarantine has been established, until the quarantine period expires?

ANS. Most assuredly they have. The intent and object of the statute is to protect the public health, and prevent the spread of contagious diseases. For that purpose local boards of health were created, and it is made mandatory upon them to take such measures as will secure that result. It is, therefore, their duty, not only to enforce quarantine regulations within their jurisdiction, but to make all necessary provision for the support and comfort of persons restrained; that nurses and other needs are supplied when necessary. In the event of death, they must prevent the holding of a public funeral. In fact, and in contemplation of law, they must have general supervision of premises quarantined during the entire period of restriction, and not until then are they released from duty in any case whatever.

Where the trustees of a township purchased land for use as a cemetery, and by the annexation of territory to an incorporated town the cemetery was merged in the annexation, does the town or the township control the cemetery?

ANS. While the title in fee simple remains in the original owners, the township, the right to control the use of the cemetery is unquestionably in the incorporated town, and by order of the council or local board of health of the incorporated town, it may be closed entirely.

Does the local board of health of a township have the right to use the township funds for the payment of the salary of the local board?

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ANS. Chapter 151, laws of 1880, creating local boards of health, makes no provision for the compensation of such boards, and under the decision of the Supreme Court, where the statute provides no compensation for services rendered by a public officer, he can get none. If local boards of health can get compensation at all, it would seem that it must be under section 3808 of the Code, which provides that "township trustees shall receive for each day's service, when necessarily engaged in official business, to be paid out of the county treasury, to each trustee, two dollars." Chapter 151, laws of 1880, provides that the trustees of a township shall constitute the local board of health for each township, and further defines their powers and duties. When engaged in the duties of a local board, the trustees are engaged in official business, in the performance of duties imposed by the statute, by virtue of their office as trustee.

In case the local physician refuses to act as a member of the board, how shall we proceed?

ANS. The query is too ambiguous to admit of intelligent solution. If by the term "local physician" is intended to mean the health officer, the local board should rescind his appointment, and appoint a successor, who will not thereby be authorized to "act as a member of the board." The health officer is not a member of the board by virtue of his office. A physician who is duly elected a member of the board may be the health officer of the board, but he must be appointed as such by the board.

Can a physician, under the present law, dispense liquor (Spir. Frument.) to his patient if he considers it necessary?

ANS. The last legislature amended the pharmacy law, and provided that it should not be construed to prevent licensed physicians from dispensing in good faith, such liquors, as medicine, to patients actually sick and under treatment at the time of such dispensing. A physician can not, under this statute, and under a decision of the Supreme Court, give a person a prescription by which such person may go to a drug store and get liquor as a medicine; for in such case the liquors are dispensed not upon the judgment of the physician as to the needs of his patients, but upon the demands of the person.

Is it the duty of a health officer to see that quarantine regulations are enforced and maintained for the proper period; to determine when quarantine shall be raised; and to see that the proper means of disinfection are carried out?

ANS. It is the duty of the local board, and police officers, sheriffs, constables and other public officers, to enforce these regulations. It is the duty of the local board to enforce and maintain quarantine for the required period, and to have the premises properly disinfected. It is not the duty of a health officer to do this. He may do it when so directed by a local board. The power and authority to do it is vested in the local board.

Are rules and regulations made by a local board in force until repealed, or must they be re-adopted by succeeding boards?

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ANS. The presumption of the law is, that they remain in force until modified, altered or repealed.

What is to be done where a local board cannot be convened, in case of emergency; as where the members reside in different parts of the township, and receive their mail in another county, and often but once a week?

ANS. The law does not presume the performance of impossibilities, but every person who takes a public office, agrees under oath, to perform all the duties of the office, whatever they may be. If he cannot do so, he should resign. There is no statute requiring any person to hold a public office. The statute requires that local boards of health shall meet to establish quarantine. For that purpose, a majority of the board has power to act. But opportunity must be given for the entire members to be present, by previous notice being given.

CLERKS OF LOCAL BOARDS.

In what manner does a clerk of a local board of health get compensation for service?

ANS. There is no express provision of law by which the clerk of a local board is to receive compensation. The statute makes the clerk of a city, town or township, the clerk of the local board. The presumption of law is that he takes the office with all the duties that are or may be attached thereto. There is nothing in the statute, however, that prevents a local board giving a reasonable compensation.

Is the city clerk the proper person to whom reports of contagious diseases should be made?

ANS. Reports should be made to the local board. A report filed with the clerk would be deemed as made to the board.

Is it the duty of the clerk of an incorporated town to go out and gather the deaths occurring in the town in order to make return of the same to the State Board?

ANS. It is the duty of the local board of health, or town council, to enforce the regulations made by the State Board regarding burial permits, when all deaths will be reported to the clerk, and no burial must be permitted without the proper permit.

Is the clerk of a local board of health compelled to work for nothing? If not, where and how does he get his pay?

ANS. The statute, Code, section 3809, says the township clerk shall receive for each day of eight hours necessarily engaged in official business, where no other compensation or mode of payment is provided, to be paid from the county treaury, two dollars. Under the provisions of section 14, chapter 151, Laws of 1880, a township clerk is made the clerk of the local board of health. This chapter provides no compensation for such clerks. The presumption of law is, that he must perform the duties of the clerk of the local board of health for the compensation provided by section 3809 of the Code. What is the necessary official business of such clerk is not for the State Board to determine.

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HEALTH OFFICERS.

1. Is the health officer of a local board an executive, or only an advisory officer?
2. If a health officer contract for supplies in quarantine against contagious diseases, and the local board refuses to pay for the same, what remains for the health officer to do?

ANS. 1. The health officer is in presumption of law, the sanitary adviser of a local board. There is no provision of statute prohibiting him from being an executive officer of the board. He has no powers whatever, except such as are conferred by the board. And this must be done by the board when in session. It can not be done by the individual members of the board.

2. The statute vests in local boards the power to fix fees and expenses for the enforcement of the health laws within their jurisdiction. A health officer would not be warranted in contracting for supplies in cases of quarantine, unless by express authority of the local board. In the case put, the remedy of the health officer would be in an action for recovery against the persons sick, and if they be unable to pay, then against the county.

Has the health officer of a local board, by virtue of his appointment, the right to establish quarantine?

ANS. No. The power to establish quarantine is vested in the local board. It must be done when in session. It can not be delegated to a committee of the board. A committee of the board, or health officer, may execute an order for quarantine made by the board.

What is the compensation of a health officer of a local board, and how is it paid?

ANS. Section 14, chapter 151, laws of 1880, says local boards shall fix the fees of all persons employed by them in the enforcement of the health laws. The presumption of law is that such fees are to be paid in the same manner as other expenses of the city or township, except in cases of quarantine.

Is it the duty of the health officer of the local board to visit a case reported by the attending physician as one of contagious disease, to affirm or deny the diagnosis?

ANS. It is the duty of the health officer to act as directed by the local board. The power to determine the diagnosis is vested in the local board. In such cases professional courtesy would suggest a mutual consultation between the health officer and the attending physician.

Must the health officer of a local board be appointed annually?

ANS. He holds his office until he resigns, or a successor is appointed.

Can a physician who is not a citizen hold the office of health officer of a local board?

ANS. The health officer of a local board of health is a public officer, and must take the oath required of every civil officer upon entering upon the duties of his office. A public officer must be a citizen of the State, but not

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necessarily an elector or voter of the place where the office exists, unless the statute expressly so declares.

What is the rule for the payment of the health officer?

ANS. His compensation is fixed by the local board. Usually the term of election is for one year.

Is a health officer expected to make examination in regard to nuisances?

ANS. It is properly the duty of the health officer to take cognizance of the sanitary condition of the territory in his jurisdiction.

Is a health officer entitled to a salary for his services?

ANS. He certainly is. The statute, section 14, chapter 151, laws of 1880, says local boards shall fix his compensation. It must be done by the board in session, not by a committee, nor a member of the board. The terms of compensatior should be definitely fixed before he enters upon his duties, so as to avoid subsequent disagreement.

Is a health officer entitled to compensation for cases of contagious diseases reported by other physicians?

ANS. A health officer is entitled to no compensation except such as is allowed by the local board. The statute says the local board shall fix the compensation of all persons employed by them. The law is mandatory and not directory.

In case of death from a contagious disease is it the duty of the health officer to assist an undertaker in preparing a corpse for burial?

ANS. It is not the duty of a health officer to assist an undertaker in preparing for burial a body dead from contagious disease, unless specially so directed, as a protective measure, by the local board.

What is the best protection for physicians in visiting persons sick with contagious disease?

ANS. In visiting premises where diphtheria or scarlet fever prevails, it is not necessary that the clothing should be changed in ordinary cases, but the face, hands and whiskers should be thoroughly cleansed with corrosive sublimate solution, or strong carbolic acid. The former is preferred, as it is a germicide; the acid is doubtful. Many carry a tongue depressor for convenience. It is doubtful if it is properly cleansed after use. The common practice is to thrust it into water and wipe it with a cloth. Probably it will be simply wiped with a rag and the rag be thrown into the stove. That certainly is not in accordance with the strict rules of anti-septic surgery. Many cases of diphtheria could be readily traced to such careless use of the tongue depressor. A much safer and better plan would be, to procure a clean spoon at the home of the patient, which when used should be thrown into boiling water. In cases of small pox, there should be worn a loose gown or overcoat, of rubber, long enough to cover the feet, buttoning at the neck and wrists. A cap of like material should cover the head and all the

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hair. This should be put on before entering the house, and put off after leaving the house. After removing the gown and cap, the hands, face and all exposed parts of the body should be washed thoroughly in soap and water, and then rubbed freely with a weak solution of corrosive sublimate. The finger nails should also be cleaned. Where clothing, as coat, vest, pants have been exposed, and which cannot be washed, they can be disinfected by sprinkling and pressing slowly and thoroughly with a flat-iron as hot as can be used without burning the fabric. There is undoubtedly much, and just cause for complaint of the neglect of physicians in guarding against the danger of carrying the germs of disease, from family to family.

Should physicians living in one township, who treat contagious diseases in other townships, report them to the local board of the townships in which the diseases are treated?

ANS. Yes.

QUARANTINE.

Is it necessary for a physician, when visiting those sick with diphtheria or scarlet fever, to change their clothing?

ANS. Ordinarily it is not, but the face, whiskers and hands should be thoroughly cleansed with corrosive sublimate solution or strong carbolic acid. The former is best as it is a germicide. The latter is not reliable. In small-pox, an outer garment of rubber or linen, buttoned to the chin, should be worn, to be laid aside in a safe place on leaving the premises and burned when the disease has subsided.

Should grey diphtheria be quarantined the same as small-pox?

ANS. Yes. Diphtheria, white, black or grey, is a contagious disease. Fifty persons die from that disease where one dies from small-pox. There is ample protection from small-pox. There is none known from diphtheria, except that secured through isolation and quarantine.

Where a child has had scarlet fever; is in 18th day, skin clearing off; no complications; thorough fumigation had; child covered with vasaline, clothed in entirely new clothing, can such child be removed by railroad to another State, all possible precaution being taken to prevent infection of others?

ANS. A due regard for the safety of others demands that the quarantine regulations in such cases be faithfully carried out. Iowa has no right to endanger other States, and the statute expressly forbids the putting on railroad cars any person affected with a contagious or infectious disease.

After a house is quarantined, if relatives persist in visiting the house, what should be done?

ANS. Confine them in the premises, or arrest them, and have them fined for violation of quarantine regulations.

Unscrupulous pill-venders placard houses where no contagion exist. How can it be prevented?

ANS. The authority to placard houses with danger cards is vested in the local board. Where difference of diagnosis exists the local board must

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decide. Attending physicians cannot establish quarantine, nor placard premises.

When a patient has been confined to one upper room, is it necessary to fumigate the whole house?

ANS. The whole house should be thoroughly ventilated and the room occupied by the patient and nurse thoroughly fumigated, the walls and woodwork washed with bichloride of mercury solution. The other parts of the house, providing persons serving the patient have no access to them, need not be disinfected.

Suppose I have a son, who has simple scarlet fever and is kept in an upper room, would I be permitted to eat and sleep in the lower rooms and attend to my usual business, provided I disinfect when I return from his room?

ANS. Yes.

When members of families on quarantined premises and other persons ignore and refuse to observe quarantine regulations, what shall be done with them?

ANS. They should be arrested, prosecuted and fined. If further aid is necessary to enforce quarantine, an officer must be placed on guard at the premises.

Where the attending physician upon cases of diphtheria in the township of A is the health officer for the township of B, can he, as such health officer, raise the quarantine and release the family in the township of A?

ANS. No. Neither a local board nor a health officer has any jurisdiction nor authority outside of the limits of the territory of which they are the officers. An attending physician has no authority to release nor establish a quarantine at all. That power belongs to a local board of health.

Is it necessary to call a meeting of the local board to release quarantine or does it cease at the end of forty days?

ANS. It is necessary under the ruling of the Supreme Court in *Young v. County of Black Hawk*, 66 Iowa. p. 460, that the local board should meet to establish or release quarantine. The forty day limit fixed by the State Board is the minimum; it may run indefinitely, or at least until there are no more cases nor exposures to infection, and no further danger from the disease, on the premises whereon it existed.

What shall be done with persons who make of themselves a walking pestilence by constantly visiting children sick with diphtheria, and going to other houses, stores and public places?

ANS. A vigorous application of the statute, and a few fines of twenty-five dollars each, will probably remove the source of trouble.

Is typhoid fever deemed a contagious disease, coming within the rule requiring quarantine.

ANS. No. Typhoid fever is deemed to be the result of a special contagium present in the excreta of typhoid fever patients; that this disease germ is multiplied after being thrown from the bowels, and finds its way into the

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intestinal track through water or food. The patient, however, should be isolated from the well, and all discharges be thoroughly disinfected and buried.

Where a family is quarantined by reason of a contagious disease, and it is necessary to furnish nurses, or attendants, and supplies, at whose expense is it?

ANS. The supreme court says that where the persons quarantined are able to pay, they must do so, but if not able to do so, then the county must pay the expense.

When quarantine is raised by the local board, is it the duty of the attending physician, or of the health officer of the local board, to disinfect the premises?

ANS. The attending physician may disinfect the premises, or the health officer, but in either case it must be done under and by direction of the local board, who alone have the power to approve the same and raise the quarantine.

Where a pupil of a public school has the mumps, how long should such pupil be excluded from school?

ANS. Mumps is an infectious disease. A pupil affected with it should be excluded from school until all enlargement of the gland has disappeared, and there is full recovery.

Can a local board quarantine persons exposed to contagious disease?

ANS. A local board has the power to quarantine persons exposed to contagious disease.

Is the disease measles subject to quarantine?

ANS. Yes.

Can quarantine be raised before the expiration of forty days? Has a health officer power to raise quarantine?

ANS. It has been repeatedly held that where a contagious disease has run its course in a family, or on a premises, the sick have recovered, there are no further exposures, and the premises have been thoroughly disinfected, and there is no further danger from infection, quarantine may be raised though the forty days from date of the last case on the premises may not have elapsed. The power to raise quarantine is vested solely in the local board.

Is it good policy or wisdom to quarantine against measles? Do we not increase the risk of fatal termination by preventing it until adult age?

ANS. Measles should be quarantined. It is a contagious and often fatal disease. A local board cannot neglect an official duty upon the assumption of a contingency that may never happen.

1. Is it necessary to quarantine measles where the householders agree to observe the rules of quarantine?
2. Should quarantine be required for the full forty days in measles?
3. Can measles be conveyed in clothing?

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ANS. 1. Measles must be quarantined. It makes no difference whether the quarantine be voluntary or compulsory.

2. The incubation period of measles is 16 to 17 days. Quarantine must be maintained thirty days from the appearance of the last case on a premises, or until all desquamation and cough have ceased.

3. Yes.

1. What is the color of the danger flags or cards to be used in the different forms of contagious disease?

2. What is the size of the letters to be used on danger flags and signals?

ANS. The rules of the State Board require the danger card or flag shall be not less than eighteen inches square, and of yellow color, which is the universal color adopted for such purpose. The letters designating the disease should cover at least the upper one-third or one-half of the signal, the remainder being used for the specific notice.

When premises are rigidly quarantined for several cases of diphtheria, and the family have become worn out from fatigue, and nurses volunteer services, provided they are not subjected to the quarantine, what is the duty of the local board?

ANS. It is the duty of the local board to provide nurses and such other assistance and supplies as may be necessary. The nurses must be subject to the same quarantine regulations as are enforced against the premises. They can not come and go at will.

1. Where a scarlet fever patient dies, and there are no other children on the premises, must the quarantine be continued the full forty days?

2. Where a city ordinance provides that, "upon notice of the appearance of any disease dangerous to the public health, the health officer shall cause to be posted upon the building, where the disease is known to be located, cards or signs announcing the nature of the disease, and said notices shall not be removed until so ordered by the health officer." Is such ordinance valid?

2. An ordinance in contravention of quarantine regulations established by the State Board of Health is invalid. The health officer of a local board has no power to establish nor release quarantine. He may enforce quarantine regulations made by the board, as an executive officer of the board, but the discretionary power is vested in the board.

Is it intended that houses wherein are persons sick with diphtheria, or diphtheritic croup, shall be placarded with danger signal the same as for scarlet fever and small pox?

ANS. Yes. Not only is that the intent, but the regulations made for quarantine distinctly so state. Diphtheritic or membraneous croup, is subject to the same sanitary and quarantine regulations as diphtheria.

Where expenses are incurred under quarantine regulations, are they to be paid by the county, or by the township out of the board of health fund?

ANS. The supreme court says such expenses must be paid by the sick person, his parent of guardian, if able to pay them; if not, then the county must pay them.

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Where a health officer neglects to qualify in due form, and the local board of health neglects to make a record of their proceedings, can quarantine be established and maintained by such board, and expenses of quarantine established by such board be recovered or collected?

ANS. According to decisions of the supreme court the action of such a board would be void, hence the expenses of quarantine could not be collected.

How is a quarantine officer acting under quarantine regulations of a local board to receive his pay?

ANS. If the quarantine has been established in accordance with the statute, the expenses of the quarantine must be paid by the sick person, if he is able to pay, otherwise the county must pay them. The statute requires that quarantine must be established, and persons employed by a local board when the board is in session; that this cannot be delegated to any person, nor to a committee of the board; and that the board must meet whenever it is necessary to establish quarantine in any case. The statute also provides that township trustees when acting in performance of duties by virtue of their office, shall receive two dollars per day.

Where an animal is affected with glanders; the owner refuses to assent to the killing of it; it is therefore quarantined by the State veterinary surgeon under the law concerning diseased animals, and the quarantine is disobeyed, what is the penalty?

ANS. Section 3, chapter 189, Laws of 1884, says that "any person who willfully hinders, or obstructs, or resists the veterinary surgeon or his assistants, or any peace officer acting under him or them, when engaged in the duties or exercising the powers herein conferred, shall be guilty of a misdemeanor and punished accordingly." The veterinary surgeon is given power to quarantine such infected animals. A violation of a quarantine, when ordered and established by him would unquestionably be deemed by the courts as obstructing him, in the proper exercise of his duty. By virtue of authority of said chapter 189, the State Board of Health and State veterinary surgeon have ordered that "No person owning or having the care or custody of any animal affected with glanders or farcy, or which there is reason to believe is affected with said disease shall lead, drive, or permit such animal to go on or over any public grounds, unenclosed lands, street, road, public highway, lane or alley; or permit it to drink at any public water-trough, pail or spring; nor keep such diseased animal in any enclosure, in or from which such diseased animal may come in contact with, or close proximity to, any animal not affected with such disease. Whenever notice is given to the trustees of a township, or to the health officer of a local board of health, of animals suspected of being affected with glanders or farcy, said trustees, or health officer shall immediately require such suspected animals to be isolated and kept separate and apart from all other animals until released by order of the State veterinary surgeon or some person acting by his authority. An animal must be considered as "suspected" when it has stood in a stable with, or been in contact with an animal known to have the glanders; or if

placed in a stable, yard or other enclosure where a glandered animal has been kept."

The object and intent of the statute is to prevent the spread of glanders and other infectious diseases among domestic animals. Any violation of the regulations made under this statute, would be an obstruction of the State Veterinary Surgeon in the performance of his duties in executing the statute.

What is the procedure to punish violations of quarantine of contagious diseases?

ANS. File a complaint before a justice of the peace, under the provisions of section 16, chapter 151, laws of 1880.

Is it the duty of the county attorney to appear and prosecute actions for the violation of quarantine regulations made by the local board?

ANS. The statute says the county attorney shall appear for the State and county in all cases and proceedings in the courts of his county, to which the State or county is a party. If an action is brought for a violation of a quarantine regulation in the name of the State of Iowa, the county attorney, under that statute, would be required to appear, of which he must be given reasonable notice.

The regulations of the State board require quarantine for a period of forty days. Does that mean from the date of the appearance of the disease, or from the date when the patient is supposed to be convalescent?

ANS. The period of quarantine must run forty days from the date of the appearance of the last case on any premises; even then it must not be released until there has been proper disinfection, and there is no further danger from infection.

Is it the duty of the officer who serves a notice of quarantine to arrest persons who violate the quarantine regulations?

ANS. The presumption of legislation is that statutes are to be enforced. The service of notice of quarantine is one step in that direction. Having the power to make an arrest for a public offense committed or attempted in his presence, it is clearly the duty of an officer to arrest a person violating quarantine regulations that have been duly established.

Where by resolution adopted by a local board it is ordered that all cases of contagious disease reported to the health officer shall at once be quarantined by that officer, would such quarantine be legal and binding?

ANS. It is understood by the State Board that under the ruling of the supreme court in *Young vs. Black Hawk County*, quarantine can be established only by a local board of health within its jurisdiction, and that it must be done in all cases. That a health officer has no power to do so; neither has he any discretion in such case. He can only execute the orders of the board. While it would appear to be sufficient for a general order made by a local board that all cases of contagious disease reported to the health officer shall be immediately quarantined by that officer, the supreme court has not affirmed such a proceeding, but on the contrary seems to deny it.

This decision was based upon section 24, chapter 151, laws of 1880, and the court says:

"The statute providing for a board of health, provides for meetings of the board at any time that *the necessities of the health of their respective jurisdictions may demand*, and the board in this case, should have met as a board, when it was known that the plaintiff's services were required, and made the proper appointment [health officer] as a board."

The court has also in other cases established the rule that where the statute prescribes certain duties to be performed by public officers, they can be done in no other way, and by no other person.

That old maxim "*qui facit per alium facit per se*," what a man does by another he does by himself, does not apply; that there must be strict compliance with the statute. Local boards should bear in mind that quarantine involves frequently large expense, for which the county is liable, and that as a rule, county supervisors will resist payment unless the liability is fixed beyond question.

The logical deduction therefore, is, that as the statute requires local boards to establish quarantine, it can be done by no other person.

What is the meaning of the term isolation of the sick, as used in quarantine regulations?

ANS. It means the complete exclusion of all other persons from the sick except the nurse and attending physician. That the sick shall be placed in a room apart from others, to which no person can have access; that the nurse shall be restrained from going to and from the premises, or mingling with the family; that all well persons shall be prevented from contact with bedding, clothing, food, or other articles that have been used on or about the sick. Where such exclusion or isolation is had, the heads of families and adult persons may be permitted to go in and out to attend to ordinary business, provided they avoid gatherings of people and children. Where from necessity the parents are the nurses, the isolation and quarantine applies to them.

Is it the duty of quarantined persons to prevent other persons entering upon the premises?

ANS. It is the lawful duty of all persons to strictly obey quarantine regulations. It is certainly a duty quarantined persons owe lawfully, and to the public, that they forbid other persons entering upon quarantined premises.

What constitutes "quarantined premises?"

ANS. "Quarantined premises" is deemed to be the building, residence or rooms wherein are the sick, or where the contagious disease exists. The term "quarantine" signifies the complete isolation or separation of the sick from the well; the exclusion of all persons except nurses and physicians from the room where the sick are, or have been, until recovery and disinfection is had.

Does the decision of the supreme court, that where persons are quarantined for contagious disease, the persons quarantined must pay the expenses

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of such quarantine if they are able; but if not able, the county must pay them, apply to cities and incorporated towns?

ANS. The decision of the supreme court cited, is based upon section 21, chapter 151, laws of 1880, which distinctly says the rule shall apply to any city, town or township within this State, which the court says can bear no other application than that the county is liable for the care of the sick persons in case they or the persons liable for their support are unable to make compensation therefor.

Should measles be quarantined?

ANS. Measlss is a contagious, infectious, and frequently fatal disease. It comes within the regulations for quarantine. The incubation period is about seventen days. Quarantine should be maintained thirty days, or until all desquamation and cough has ceased, after the appearance of the last case in the family. In case of the outbreak of measles in a community the public schools should not be closed, unless the sick outnumber the well, and the schools thereby become decimated. By closing the schools the children are thrown together; they will inter-visit and play together, thereby increasing the exposure. By continuing the schools, isolating the sick, and prohibiting teachers from visiting the sick, the exposure is greatly lessened. It should be borne in mind continually, that fatal cases may come from exposure to the mildest.

Where a family voluntarily assents to quarantine regulations, as provided by the State Board; there is no meeting held of the local board to establish quarantine; the premises are placarded by the city marshal, acting by direction of the health officer; expenses are incurred for nurses and care of the family during the quarantine period; does such quarantine come within the rule of the sections 21 and 22, chapter 151, laws of 1880, and the decision of the supreme court thereon, holding the county liable for such expense?

ANS. This is a question of law and of fact. The statute requires local boards to meet and establish quarantine in each case. Whether or not in this case the voluntary assent to quarantine would bring it within the rule, depends upon the subsequent action of the local board. These facts are not before us, hence no opinion can be given.

Whose duty is it to enforce quarantine regulations in cases of contagious disease? Is it the duty of the local board of health, or of the city marshal?

ANS. The power to make quarantine regulations is vested in the State and local boards of health. Local boards act within their own jurisdiction. Under section 2, chapter 151, laws of 1880, it is made the duty of all public officers to enforce such regulations; a city marshal, therefore, is required to enforce quarantine regulations made by the local board of the town or city of which he is an officer.

Where a laboring man, dependent on his daily labor, and his family are quarantined, must the county physician attend to them, to make the county liable for the expense, or can the sick employ a physician whom they prefer?

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ANS. The county physician has nothing to do with such cases. Neither is the health officer of a local board required to treat them. The statute authorizes and requires local boards to "make effectual provision for, and to do whatever is necessary for the isolation of infected persons, and for the safety of the inhabitants." This involves, the provision of medical assistance, food, and whatever is made necessary by reason of such isolation and sickness. The presumption of the law is that the sick may have any physician they prefer to treat them.

Suppose a man that is utterly worthless financially, a man that you could not recover a cent from, wantonly and even viciously violates an order made by the local board. How can we recover against him? Are we not relegated back simply to a civil action? Let me put a hypothetical case: A man who is not worth a dollar—a judgment against him would be worthless; he wontonly and repeatedly violates the rules; tears down a card of warning that is placed on his house; refuses to obey the quarantine; and in other matters utterly disregards the action or orders of the local board. To sue him would be useless; can we punish him? if so, where is our authority for it? I have carefully read section 456 of the Code, and noted the decision under it; I have my doubts about passing an ordinance making it a misdemeanor—or a fine under the same. Our State law only provides for civil liability, and an ordinance in excess of that might be absolutely void.

ANS. Where the city of Cedar Rapids' board of health prohibited the keeping of hog pens within the limits of the city, and the city council of that city, under the municipal law, enacted an ordinance providing that any person who shall knowingly violate or fail to comply with any rule or regulation of the board of health should be deemed guilty of a misdemeanor, and punished as provided by ordinance, the supreme court says the ordinance is valid, and that cities have the power to make such an ordinance. Under this decision, therefore, a person who violates a regulation of the local board, commits two offenses in one act; one under the statute, for which he may be proceeded against in a civil action, and one under the ordinance, for which he may be proceeded against in a criminal action.

When premises are quarantined by advice of another doctor, other than the health officer, can the family be released by the advice of the attending physician?

ANS. Neither the attending physician nor the health officer have authority to establish or release quarantine. It must be done by order of a local board.

Has a local board of health the right to delegate a health physician the power to quarantine a family, and raise the same without the board being called to act in the matter?

ANS. Under the rulings of the Supreme Court a local board can not delegate to any person the power to do that which the statute provides shall be done by the board. The power to establish and release quarantine is vested in the local board. Though a health officer may establish or release a quarantine when so directed by a local board, he has no discretionary power in the matter.

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It is asserted that there is no danger from contagion or infection from scarlet fever until desquamation begins. Is that true?

ANS. No. There is danger from infection when eruption appears.

NUISANCES

Has the State Board of Health power to abate or remove a creamery nuisance?

ANS. No. The legislature has given the State Board only the power and authority to make regulations concerning nuisances that affect the public health, and has vested in local boards and the courts exclusively, the power to execute them.

It is proposed to establish a cemetery about thirty rods from a reservoir of water, which is twenty feet lower than the cemetery site. The reservoir is also used as supply for cutting ice for public use. Would the public health be endangered by such location of the cemetery, the surface drainage being toward the reservoir?

ANS. Such a location of a cemetery would be unwise, and the probabilities great of the contamination of the water in the reservoir. It should not be permitted.

Has a local board of health or a city council the right to remove a slaughter house beyond the limits of the city?

ANS. A local board has the power to require slaughter house to be kept clean and in an unoffensive manner within the limits of the jurisdiction of the board. If it can not be so kept they may order it removed. A city council has the power to absolutely prohibit slaughter houses or hog pens within the limits of the city.

It is proposed to locate a livery barn within three feet of my residence, and the horse stalls will be but a few feet from my well, and there is great danger of contaminating the well, and not only my own family will suffer, but others also. Is there no protection against such an outrage?

ANS. The location of the barn may be restrained by an injunction. The common law guarantees to every person the free, unobstructed use of air, light and water. Whether or not the location of this stable would be an obstruction to either depends on facts, to be determined by the local board or the courts, as to the manner in which the stable is to be kept, and contamination of the well by surface drainage or soil percolation.

What is the law regarding the dumping of offal, dead animals, etc., so near my premises as to endanger the health of my family and that of the public?

ANS. A nuisance is anything wrongfully done, or permitted, which injures or annoys another in the enjoyment of his legal rights. Every person has the legal right to the fullest enjoyment of his life and health. Anything, then, which injures or annoys the public in the enjoyment of life or health, is a nuisance, which it is the duty of boards of health, as the guardians of

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the public health, to abate. It may be said that public health nuisances are of two kinds:

1. Those which are *per se*, or which are such from their very nature, and which can not exist in the vicinity of habitations without causing offense to the senses and injury to the health; such, for instance, as the exposed and decaying carcasses of dead animals, or accummulations of offal, garbage, and slops, or fœcal matter in exposed places.

2. Those which are *prima facie*, or which become nuisances by reason of the misuse or negligent care exercised of an otherwise harmless and perfectly lawful object, business or occupation; as for instance, slaughter houses, rendering establishments, mill ponds or burying grounds.

If a board of health finds any decomposing or offensive matter upon private property, which, in their opinion, is injurious to health, they must first order the owner or occupant to remove it within twenty-four hours. If he neglects to do so, they may proceed summarily to cause such nuisance to be removed. If the danger to public health is imminent, and safety requires immediate suppression or abatement of the nuisance, the board of health would be protected if they proceeded at once to suppress it, for the safety of people is the highest law. If any unhealthy nuisance is found in a public place, it is the duty of the board of health to cause its immediate removal.

If a pond, a slaughter-house, or a burial ground, or anything of a kindred nature, becomes offensive and unhealthy to a community, it is the duty of the board of health to proceed at once to abate the same. Whether a business or a thing, not in itself a nuisance, is so managed or suffered to exist as to be a nuisance, is a fact which must be determined by the board upon investigation made by them. Although slaughter-houses are regarded by the courts as *prima facie* nuisances, a person engaged in carrying on the business of slaughtering animals cannot be compelled to discontinue that business upon the judgment of any tribunal except that of a court of competent jurisdiction. In this way alone can a board of health *legally* determine whether such a business is a nuisance so as to authorize them to abate it. But any collection of offal or filth in or about the slaughter-house may be removed by the board of health, and the place may be required to be kept clean, under the authority conferred by sections 17 and 18, chapter 151, laws of 1880, but the suppression of the business itself can only follow a judicial determination that it is so conducted as to be injurious to the public health.

As to whether or not animals affected with a contagious disease may be summarily destroyed, the general rule seems to be that so long as the owner restrains the animal upon his own premises, no person has a right to kill them (except as provided by regulations of the State veterinary surgeon under the provisions of chapter 189, laws of 1884); but if they are suffered to go at large, or if they escape from the owner's custody, the owner of the premises upon which they escape may kill them if necessary for the protection of his own animals. In the case of a horse or other animal affected with glanders, which is recognized by the courts as an incurable disease, and one which may communicate all its loathsomeness and fatality to human

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beings, there is no question but what a board of health would be protected in destroying them wherever found, after due notice given to the owner, if in their opinion it was necessary for the public health.

But where a local board of health neglects or refuses to act, an action in the courts for an abatement of the nuisance or for damages is not precluded. Neither is the finding of a local board of health of the existence of a nuisance a condition precedent to the maintenance of an action for damages.

Where a local board neglect or refuse to abate nuisances like hog pens and stock yards, creameries and stables, what is the remedy? Cannot the State Board of Health interfere for the benefit of the public health?

ANS. No. The statute gives the State Board of Health power to make rules and regulations concerning the public health, and "charge of all matters pertaining to *quarantine;*" but no authority in the abatement of *nuisances*. It gives to local boards the power to make such regulations as they may deem necessary to protect the lives and health of the people within their jurisdiction and enforce them, also, to enforce regulations made by the State Board. This power of local boards, to make regulations being discretionary, if such board neglect or refuse to exercise it, there is no provision of law to compel the board to act. The only remedy is in the election of a board who will have a higher regard for the public health. It is the statutory duty, however, of local boards to enforce regulations made by the State Board. In this they have no discretion, and this rule applies to all "police offices, constables, sheriffs and all other officers of the State."

Where, under an order of the local board of A requiring all dogs running at large to be muzzled, and a dog without a muzzle was shot, and escaped into the township of B, where he died, by whom must the dog be buried, the owner of the dog, the local board of B or the local board of A?

ANS. It is the duty of the local board to abate all nuisances injurious to the public health found within their jurisdiction, provided the owner or the occupant of the premises whereon the nuisance exists, neglects or refuses to remove the same after due notice. There is no provision of law whereby the local board of A can be required to go outside the limits of its jurisdiction to abate a nuisance within the jurisdiction of another local board. The local board of B must bury the dog.

It is claimed by some members of our local board that the health officer has no power to order or direct premises to be cleaned and nuisances removed. That it is simply his duty to report cases to the local board, and that the board when in session must order the nuisance removed. What is the law on this point?

ANS. The statue says local boards shall make such regulations regarding nuisances, sources of filth and causes of sickness as may be necessary for the protection of the people. The supreme court makes a clear distinction as to the power of a local board in this regard and to quarantine. In the former they are general, in the latter, specific. It is therefore only necessary that the board provide by general regulations against the keeping and maintaining of nuisances, as hog-pens, stables, creameries, slaughter-houses, etc.

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and also providing that they shall be kept clean. In cities and towns such regulations may be supplemented by an ordinance providing that violation of regulations made by the local board of health shall be deemed a misdemeanor, and punished by a fine of not less than twenty-five dollars.

Under such regulations a board may designate the health officer or a peace officer to enforce them.

Can a man whose hogs die of hog cholera be compelled to bury the hogs?

ANS. Under the provisions of chapter 79, Laws of 1886, he can be compelled to bury the hogs; and if he neglects or refuses to do so, he can be fined from five to one hundred dollars.

Where a cow-stable and hog-pen is being built within twenty feet of my residence and well, how can I prevent their construction, to prevent the contamination of my well and a nuisance to my dwelling?

ANS. By injunction proceedings, by which the construction may be stopped until the matter can be heard on its merits. Local boards of health have no jurisdiction over private nuisances. Their duties relate to those affecting the public health.

Is there any means to prevent making and burning of brick, the smoke from which enters my house at certain times, requiring doors and windows to be closed against it?

ANS. Yes. Upon sufficient facts shown, the works may be perpetually enjoined.

The supreme court has decided in the case of the *Town of Nevada vs. Hutchins*, 59 Iowa, 506, that cities and towns have no power to provide by ordinance for the punishment by fine of persons guilty of creating a nuisance. In the case of *Cedar Rapids vs. Holcomb*, the court decided that an ordinance providing a penalty for keeping a hog pen was valid. Is not there a conflict between these two opinions?

ANS. The State Board of Health is not authorized to determine questions that belong to the courts, nor to decide as to the stability of the supreme court. But it may be said, generally, that there is not really any conflict in the decisions cited. In the Hutchins case the acts prohibited by the city ordinances were expressly prohibited by statute. The basis of the decision in that case was, that a city cannot usurp the powers of the legislature, by enacting the laws of the State as ordinances, and provide other penalties for offenses.

In the Holcomb case the court upheld an ordinance providing a punishment for violation of a regulation made by the local board of health, prohibiting the keeping of hog pens within the city. The keeping of hog pens in cities is neither prohibited nor declared to be a nuisance by the statute. There is no decision of the court that holds otherwise, than in the Holcomb case, that cities may enact such reasonable ordinances as are calculated to promote the public health.

What is a nuisance? How can it be abated?

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ANS. At the common law, a nuisance is deemed to be anything wrongfully done, or permitted, which injures or annoys another in the enjoyment of his legal rights. Every person has the legal right to the fullest enjoyment of his life and health. Anything, then, which injures or annoys an individual or the public in the enjoyment of life or health is a nusiance.

The statutes of Iowa define a nuisance as follows, in the Code:

Sec. 3331. Whatever is injurious to health, or indecent or offensive to the senses, or an obstruction to the free use of property, so as to essentially interfere with the comfortable enjoyment of life and property, is a nuisance, and a civil action by ordinary proceedings may be brought thereon by any person injured thereby; in which action the nuisance may be enjoined or abated, and damages also recovered therefor.

Sec. 4089. The erecting, continuing or using any building or other place for the exercise of any trade, employment or manufacture which by occassioning noxious exhalations, offensive smells, or other annoyances becomes injurious and dangerous to the health, comfort or property of individuals or the public, the causing or suffering of any offal, filth or noisome substance to be collected or to remain in any place to the prejudice of others; the obstructing or impeding without legal authority the passage of any navigable river, harbor or collection of water; or the corrupting or rendering unwholesome or impure the waters of any river stream or pond; or unlawfully directing the same from its natural course or state to the injury of prejudice of others; and the obstructing or incumbering by fences, buildings or otherwise of public highways, streets, alleys, commons, landing places, or burying grounds, are nuisances.

Sec. 4092. Whoever is convicted of erecting, causing or continuing a public or common nuisance as described in this chapter, or at common law, when the same has not been modified or repealed by statute, where no other punishment therefor is specially provided, shall be punished by a fine not exceeding one thousand dollars, and the court, with or without such fine, may order such nuisance to be abated, and issue a warrant as hereinafter provided.

Sec. 4093. When upon indictment, complaint, or action, any person is adjudged guilty of a nuisance, the court before whom such conviction is had, may, in addition to the fine imposed, if any, or to the judgment for damages, or cost for which a separate execution may issue, order that such nuisance be abated or removed at the expense of the defendant, and after inquiry into and estimating as nearly as may be, the sum necessary to defray the expenses of such abatement, the court may issue a warrant therefor.

Sec. 4094. When the conviction is had upon an action before a justice of the peace, and no appeal is taken, the justice, after estimating as aforesaid the sum necessary to defray the expenses of removing or abating the nuisance, may issue a like warrant.

Under the statute creating local boards of health, such boards have the power, and it is made their duty to cause the abatement of nuisances affecting the life and health of the people within their jurisdiction.

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In the case of *Morrison vs. Marquardt*, 24 Iowa, 35, the supreme court says, A party may with his own hands abate that which to him is a nuisance, but he cannot needlessly destroy the property, as it is only the offensive use of it, that he is justified in abating.

PUBLIC SCHOOLS AND SCHOOL-HOUSES.

Where a physician refuses to have his certificate for re-admission of a pupil into school, who has been excluded by reason of infectious disease, approved by the local board, what shall be done?

ANS. The regulations of the State Board require such certificate shall be approved by the local board. It makes no difference what the attending physician may think about it. A teacher who admits a pupil on a certificate without such approval is liable to a fine for violation of quarantine regulations and should be dismissed from service.

Where several pupils in a school room were infected from other pupils with diphtheria, and died, what should be done with the school books used by them?

ANS. The safest thing to do is to burn the books. To attempt to disinfect them would give no assurance of success, and would involve a serious risk of danger.

Where a local board has no health officer, will the certificate of the attending physician, that no danger exists from contagion, be sufficient to readmit a pupil to the public schools who has been excluded for contagious disease?

ANS. No. The authority to readmit must come from the local board in the case put. It is the local board who is vested with the protection of the health and lives of the people in their jurisdiction against contagious diseases, and not the attending physician, nor the board of school directors.

Will the certificate of the attending physician that there is no danger of contagion readmit a pupil excluded from school because of contagious disease, or must the health physician of the local board make such certificate?

ANS. The power to readmit a pupil in the case put is vested in the local board, and the approval by the board, or the health officer, as an executive officer of the board, of the attending physician's certificate, is necessary, under the regulations made by the State Board.

Where the attending physician gave a certificate of health to a pupil to re-enter school, and the board of school directors refused to admit the pupil, is this a case for the interference of the school board or local board of health?

ANS. The local board of health has complete jurisdiction in the matter. The school directors cannot interfere. The statute gives the State Board of Health general supervision of the lives and health of the people, and power to make regulations in regard thereto. That board has made regulations regarding the readmission of pupils to the public schools in cases of contagious diseases, and those regulations relegate the discretionary power to local boards, who by law are vested with quarantine powers.

Where a public school was closed by reason of an epidemic of Diphtheria among pupils, and at the boarding place of the teacher, and by direction of

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the local board, the books and effects of the teacher in the school room were destroyed, and her trunk and clothing placed under quarantine, while she removed from the locality, what are her rights as to the books destroyed, her trunk and clothing, and compensation for the period during closure of the school?

ANS. The teacher would be clearly entitled to payment for the books destroyed, provided such teacher was not negligent of duty, as required by the regulations of the State Board, made and specially directed to teachers. The trunk and clothing may, after disinfection and proper cleansing, be returned to the teacher. The whole is a matter for the local board to determine upon the facts. The matter of compensation is a question of law and fact, to be determined by the courts.

Can a board of school directors prohibit persons exposed to contagious disease from attending school?

ANS. Yes. It is also the duty of all school teachers to exclude such persons, without action of the school board.

Is there any provision of law to prevent the use of school houses for holding public funerals?

ANS. While the control of school houses is vested in the sub-director in district townships, and the board of directors in independent districts, subject to instructions from the electors, a local board of health has the power to prohibit their use for holding funerals or any gathering of people, whenever it may be deemed necessary to protect the public health.

Where a teacher or a pupil, who have had measles, and are boarding in a house where there is a case of measles, is it necessary that they should change their boarding place, or leave the school?

ANS. Yes. Unless the sick are so completely isolated as that no communication is had with them, nor any possible danger of infection.

1. Should whooping cough be quarantined the same as scarlet fever?
2. Where typhoid fever exists in a house, should the premises be quarantined and children of the family be excluded from the public schools?

ANS. 1. Whooping cough is an infectious disease. A pupil of the public schools affected with it must be excluded from the schools until entire recovery. He should be isolated from all other children. There is no necessity for quarantining adult members of the family, or the premises, except to exclude children.

2. There is no necessity for quarantining in a case of typhoid fever as in scarlet fever or diphtheria, but the sick should be isolated, and great care exercised to disinfect all excreta and urinary discharges. The danger lies in the discharges from the bowels and kidneys, hence the importance of thorough disinfection of those and also the clothing and bedding of the sick.

Where, in a town of 1,500 population, scarlet fever has been present continuously for three months, with eight cases at present, should the public schools be closed?

ANS. No. Quarantine all infected premises against all children and rigidly isolate the sick. With proper isolation of the sick and their nurses, the

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heads of families and adults may attend to their regular vocation, keeping away from public gatherings and especially from children.

Should a child be permitted to re-enter school ten days after the appearance of eruption of measles?

ANS. No. The child must be excluded at least ten days after all eruption has disappeared. Though he may be permitted to go about his home he must not re-enter school.

Where the yard of a sectarian school is enclosed with a barbed wire fence, has the board of health power to cause the fence to be removed?

ANS. The statute regarding barbed wire fences around school houses applies only to public schools. The statute vests no power in local boards of health in such matters. Whether or not the State Board has authority in the premises, query.

Where the children of the principal of a public school have scarlet fever; he goes from home to board, and recovery of the children is had in two weeks, can he return home at the expiration of the two weeks?

ANS. It makes no difference whether scarlet fever appears in light or the most malignant form. The danger from infection is the same in both instances. In the case cited special reasons exist for refusing to permit a school teacher to return to his home the third week of quarantine period. In scarlet fever desquamation does not usually cease until the seventeenth day. It is during the desquamative process, in convalescence, that great danger lies to infection. To permit a teacher thus to do, would thereby endanger the lives of others, and especially children, who are susceptible to the disease. If the disease has subsided, the sick entirely recovered, desquamation fully completed, and the premises and sick disinfected, the teacher may return home. But he cannot re-enter school except upon the assent of the local board, in whom is vested the power to release quarantine, and the State Board will not interfere therein.

Must all certificates for readmission of pupils to the public schools, excluded by reason of contagious disease, be approved by the local board, or health officer; or can the local board instruct school superintendents to readmit pupils on the certificate of all physicians in town?

ANS. There is possibly no limit to what a local board can do; but what they can rightfully do is quite another question. The exclusion of pupils from the public schools is a part of the quarantine regulations made by the State Board under their vested authority. Neither local boards, a health officer, nor attending physician can rightfully interfere with such regulations. The power to establish and maintain quarantine, within their jurisdiction, is vested in the local board of health, who alone has power to raise the quarantine. The supreme court has decided that local boards must meet to establish quarantine whenever quarantine is necessary; that is, they must make such regulations as are necessary in each case. The presumption, therefore, is, that a general order establishing a quarantine whenever

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a contagious disease appears, will not do, as the conditions and circumstances are not always the same, and of these, the board must have knowledge. They should ascertain where the infected party is, what measures are necessary to control it; what restrictions are necessary to persons, and to whom, and to what extent they should apply. They must in each case exercise reasonable judgment, and adapt their regulations to the circumstances, and yet secure isolation of the sick. The regulations require the certificate of the attending physician for readmission to be approved by the local board. The approval must follow the issuance of the certificate, which is wisely made the basis of the approval. Approval previous to issuing the certificate, would thereby prevent the opportunity for the board to inquire into the facts, and open the way to great irregularity, and probable danger. No person can be released from quarantine except by order of the local board.

Are there any regulations regarding vaccination in private or parochial schools?

ANS. The regulations of the State Board of Health require every person entering any public school to give satisfactory evidence of protection by vaccination. Local boards of health have the power to require protection in all schools, and of all children, or even all persons, within their jurisdiction. It is well established that schools are among the most prolific sources of the spread of contagious diseases.

CORPSES.

Where a child dead from diphtheria was buried in a wood casket, made air tight by rubber at joints, then placed in a zinc-lined box, can such body be disintered and removed to another state by railroad?

ANS. Yes, provided the assent of the local board of health is obtained, a permit for disinterment is secured from the State Board of Health, and the regulations for a transportation permit are complied with.

Is it necessary for the health officer of a town to notify the health officer in another town when a dead body has been shipped thereto?

ANS. There is nothing in the regulations requiring such notice to be given. Railroad companies require all dead bodies to be accompanied by some person. In all incorporated cities and towns a burial permit is required. These measures are deemed sufficient to bring notice to the health authorities at the point of destination.

Under what restrictions can the body of a person dead from small-pox, buried ten years ago, be disinterred and removed to another cemetery?

ANS. No authority will be given for the disinterment of a body dead from small-pox under any restrictions, and the transportation of such a body is absolutely prohibited.

In securing the approval of a local board of health of a permit issued by the State Board for the disinterment and removal of the dead body of a person, is it sufficient if the approval is signed by the president and secretary of the local board, without previous formal action of the local board?

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ANS. The regulations require the approval of the local board, attested by the president and the secretary. The doctrine is firmly established by the Supreme Court that where the statute requires certain duties to be performed by a public officer, they can be done in no other way, nor by any other person. Regulations made by the State Board, within the purview of their authority, are binding upon the people. The presumption of law is that the local board has the right to be heard concerning the matter; that it must give its assent to the disinterment. The statute has made the local board the guardian of the life and health of the people within their jurisdiction. The signing of a disinterment permit by the president and secretary of a local board, would not, in contemplation of law, be deemed an approval of such permit by a local board.

Where a physician's return of a death gives "heart failure," or some sequala of a contagious disease, as a cause of death, is such physician's return conclusive upon a local board, on application for a transportation permit for the body of the deceased?

ANS. The regulations for the transportation of corpses, require the permit for removal to be approved by a local board of health. The board must be agreed that the cause of death of the deceased person is not among the list of diseases inhibited, and that the body has been prepared for removal in accordance with the regulations made and provided for the protection of the public. The physician's return of a cause of death is not conclusive against a local board. A local board may make such investigation as is deemed necessary to ascertain and establish the real cause of death.

BURIAL PERMITS.

Where parties refuse to apply for burial permits, and the physician last attending a patient refused to make a return of the death at all, what is the remedy, and of whom should complaint be made to secure the enforcement of the law?

ANSWER. Where an incorporated town or city has adopted the regulations made by the State Board concerning burial permits, such city or town may, by ordinance, provide a penalty for any violation of such regulations made by its local board of health, whereupon complaint may be made in the same manner as for the violation of any city ordinance.

Is a burial permit required when the corpse is brought from outside the limits of the town?

ANS. The regulations regarding burial permits applies to all cities and incorporated towns. A burial permit should in all cases be required before a burial therein.

KEROSENE.

Which is the best oil for use; that which flashes at one hundred and eight degrees Fahrenheit, or that at one hundred and twenty-four degrees Fahrenheit?

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ANS. For use in ordinary lamps, carbon oil with a flashing point of one hundred and five to one hundred and ten degrees will give the best satisfaction. Oil with a flash of one hundred and twenty-four degrees will not burn freely with a flat wick, and will congeal in cold weather. It is intended for round or argand burners.

Where kerosene oil is purchased in tank cars, and drawn therefrom into ten-gallon cans to be sold to retail dealers, is it required that the cans should be branded by the State oil inspector or his deputy?

ANS. The statute requires all products of petroleum offered for sale in this State, for illuminating purposes, to be inspected, and when inspected, that the inspector shall put upon every "package, barrel or cask," containing the same, his brand of inspection, and any person who shall "sell, or attempt to sell any product of petroleum, which has not been inspected as provided by law," is liable to a penalty of not exceeding $300. The statute, therefore, requires all products of petroleum, kerosene as well as gasolene, to be inspected and branded. The branding is notice to the public of the inspection. The statute makes no distinction in the form or size of the vessel in which such product is placed. It is no less imperative that when fifty gallons of kerosene are put into five ten-gallon cans that the cans be branded than that fifty gallons of kerosene taken from the same tank and put into a barrel be branded. The quantity in a vessel has nothing to do with it. When a product of petroleum to be used for illuminating purposes has been inspected, and passes from the possession of the person for whom the inspection was made, the fact of such inspection must be shown upon the vessel from which it is to be sold again or used. When inspected in a storage tank or tank car, it need not be re-inspected when barreled or canned, but the barrel, can or package must be branded according to the actual standard of the article contained therein. The barrel or can must not be branded before filling.

If a fluid is made according to a certain receipt from gasolene of lawful test, can it be used for illuminating purposes?

ANS. The proposition is a contradiction. There is no lawful test of gasolene. It cannot be used for illuminating purposes in Iowa. Gasolene is one constituent of naptha. Nothing can be added to naptha that will change its explosive nature. The sale or use of those so-called safety fluids, or of any oil for illuminating purposes which are the product of petroleum, which have not been inspected in this State, and approved, is prohibited in this State, and all agents selling such should be arrested, and fined or imprisoned as provided by law.

Should naptha be branded by oil inspectors and rejected for illuminating purposes the same as gasolene.

ANS. Yes. It has been so ordered.

Where an oil inspector tests three car tanks of oil, two of which he approves and rejects one, and the whole is pumped into a storage tank, and

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the mixture then fails to pass inspection, may sufficient oil of higher oil be added to bring the whole up to the required standard?

ANS. Yes. But the inspector must know that the mixture is of the required standard, and he must continue the inspection until the same is subject to approval. There is no such rule as averages permissable in the inspection services—that is, that a mixture of one hundred barrels of oil at 108° and one hundred barrels of 104° oil make two hundred barrels averaging 106°. The inspector must know the exact quality of the oil before he affixes his brand thereon, and that can be determined only by actual inspection and test.

In reply to interrogatories from several oil inspectors the following rulings are made:

An inspector is strictly prohibited from branding empty barrels to be subsequently filled with any product of petroleum intended for, or to be used for illuminating purposes,

He is also prohibited from permitting his stencils or brand to be in the custody of any other person. His brand or stencil is equivalent to his official signature to the statement set forth by the brand, and is affixed under his official oath as a public officer. Any other use of it is, therefore, fraudulent, and for which the inspector would be clearly liable.

Rule 13 is construed to mean that when a lot of barrels are to be filled from a storage tank, the oil must be tested and the inspector must know the quality and standard of the oil before he affixes his brand thereon. No such thing as averages is permissable in the inspection service. That is, that a certain number of barrels of oil of different quality will make a mixture of a certain other grade or quality. It is impossible to know the quality of oil in a storage tank at any time without making the proper test.

There is no objection to branding empty barrels as "rejected for illuminating purposes," which are to be subsequently filled with gasolene.

Naptha and benzine must be branded in the same manner as gasolene.

Where oil is shipped into this State in barrels, or from one point in this State to another point in this State, that has not been lawfully inspected within this State, each and every barrel must be inspected, and the oil therein tested. The testing of one barrel will not authorize an inspector to brand the entire number as of the standard of the barrel tested.

Is it necessary to have gasolene that we desire to ship into the State of Iowa inspected by the State Inspector?

ANS. The statute requires all products of petroleum used for illuminating purposes in this State to be inspected. Gasolene is used surreptitiously whenever possible, for illuminating purposes. As its flashing point is below the legal standard, it is the duty of inspectors to brand all gasolene as "rejected for illuminating purposes." The same rule applies to naptha and benzene. The inspection must be made within this State.

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RETURNS OF BIRTHS AND DEATHS.

I am having complaints because physicians fail to return their births and deaths that occur in their practice, especially the latter to the county clerk. These complaints are made by persons who want to use the records. What had better be done in regard to these reports?

ANS. It is the duty of the county clerk to prosecute every physician and midwife who fails to make reports as required by law. A vigorous dose of the statute would cure the evil.

Where a physician visits a patient at the request of the attending physician, and the patient dies before the next appointed visit of the attending physician, who is responsible for the return of the death to the county clerk?

ANSWER. The visit of a physician to a patient, as an act of professional courtesy, does not relieve the attending physician from liability. The case would be different if the attending physician had been discharged, though the last physician had seen the patient but once.

Should the physician last called to see a patient make the return of death?

ANS. Whether or not the physician last called to see a patient should make the return of death depends upon the facts. A physician may be called but a few hours before death, or in case of a relapse, when the attending physician had considered the patient convalescent, and ceased his visits. In such case the physician last called could not be deemed the physician having had supervision of, or care of the patient, so as to make the return of death, as contemplated by the statute.

A was attending a patient, and informing the relatives that the patient was dying, that he could do no more, and ceased his visits. B was called, who confirmed the opinion of A, and prescribed nothing. The patient died. Should A or B make the return of the death to the county clerk?

ANS. The statute requires all physicians to make return of all deaths which come under their supervision. In the case put, A being the first physician called, if he prescribed medicine, then he became the attending physician. B, subsequently called, prescribed nothing, assuming no charge of the patient, could not be deemed to have had supervision of the case. It was not his patient. Because death ensued after A abandoned the patient, does not relieve A from his duty under the statute. A is the attending physician, and must make the return.

Where a physician refuses to make written return of a death, to the city clerk, what is the remedy?

ANS. The city or town council must, by ordinance, require such returns to be made under a penalty. Violations of the ordinances may then be enforced as in other cases. In the absence of an ordinance, prosecution must be made under the statute, for violation of regulations made by the State Board of Health concerning burial permits.

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In the return of a marriage required to be made to the county clerk, there is given, for instance,

8. Full name of groom [John Wesley Jones].
13. Full name of bride [Mary Jane Smith].

Attached to the statement is the following certificate:

.....18....

We hereby certify that the information above given is correct, to the best of our knowledge and belief.

.....(Groom.)
.....(Bride.)

The question is, what should be written on the blank lines above?

ANS. The certificate should be signed by John Wesley Jones, as groom, and Mary Jane Smith as bride, as certifying to the preceding statement. The marriage is then to be certified to by the person officiating.

Is Iowa a malarious State?

ANS. No. The record of vital statistics show that the deaths in the State from malarial diseases is but a fraction over three per cent of the total deaths. As a State there are no malaria breeding places. The greatest number of deaths from this cause is in communities where proper sanitary regulations are neglected.

Where a physician notifies the clerk of a district court that he shall make no report of births and deaths until his rival practitioners do, what shall be done?

ANS. The State Board of Health has no jurisdiction in the matter. The statute, section 5, chapter 151, Laws of 1880, requires all physicians and midwives in this State to report to the county clerk all births and deaths occurring under their supervision. For neglect or refusal so to do, the same section makes it the duty of the county clerk to prosecute the offenders. The Supreme Court, in *Robinson, Clerk of Mills County, vs. Hamilton*, says this statute is valid and physicians are lawfully bound to make the reports.

FUNERALS.

Should ministers be permitted to go from house to house to hold funeral services in cases of death from Scarlet Fever and Diphtheria?

ANS. No. They must be absolutely prohibited. Neither can a public funeral be held in such cases. Numerous instances have recently been reported to the State Board where children have died from Diphtheria carried by ministers guilty of such practice, which is really criminal. Funerals are among the most prolific sources of the spread of this disease, and local boards must take rigid measures to prevent them. There is no sentimentality in dealing with pestilence. The protection of the living is paramount to obsequies for the dead.

Where the local board does not think it necessary to quarantine a family in which there is a case of Diphtheria, and the patient dies, is it the duty of the attending physician to report the death to the local board so that a public funeral may be prevented?

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ANS. It is the duty of a physician to report all cases of contagious disease coming under his supervision, to the local board. It is then the lawful duty of the local board to take cognizance thereof, and know that the regulations made and provided therefor are observed, until the disease has subsided and premises properly disinfected. An attending physician has done his duty when he reports to the local board. It is not his duty to require the local board to perform their duty. But where a local board is so direlict, an attending physician, having in view the public weal, can do no less than notify the local board of the death of his patient—not as a lawful duty, but a duty he owes to society.

Where, in the regulations of the State Board regarding public funerals of those dead from contagious disease, it requires the body to be "buried immediately," how long can the body remain in the house, after death; and what is a "public funeral?"

ANS. The term "buried immediately" is to be strictly construed. It admits of no qualification. It means at the earliest possible and reasonable time to prepare the body for burial. It is the protection of the living sought in the rule. The public good is always paramount to individual interest. A "public funeral" is deemed to be the attendance of persons not 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 interment. In other words, there must be *none* present except those absolutely necessary to prepare the body for interment or inter it.

Do the rules of the State Board regarding public funerals of persons who have died from contagious disease, apply to clergymen?

ANS. There is no objection to a clergyman holding a brief religious service in an infected house in the presence of the family, or only those who have been exposed, provided no other persons are admitted; and provided further, that the clergyman takes all the necessary precaution to prevent spreading the disease. He should understand that he assumes the great risk of not only the infection of himself, but of his own family. A case occurred in Monroe county, last year, where a clergyman attended the burial of a child dead from scarlet fever; went home; his own child was infected from his clothing and died. The same reasons which prohibit visitors from entering the premises, or having intercourse with the sick, before death, exist with equal force until the dead is buried, and the premises thoroughly disinfected.

WATER.

I desire to have the water of my house well analyzed. What are the necessary directions?

ANSWER. The State Board will furnish an analysis of water only when the same is suspected of being a cause of sickness, or when a water supply has been condemned by a local board. The request for analysis in such case must be made officially by the local board. When a city, town or

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school board, or a community, desire an analysis of water intended for public use, taken from water-works, lakes, springs, streams or wells, the State Board of Health will procure the same, at reduced rates, and pay one-half of the expense, provided the request to do so is made officially by the local board of health or the school board.

DOGS.

Has a local board power to make regulations requiring dogs running at large to be muzzled, and ordering dogs not muzzled to be shot?

ANS. Local boards have the power to make such regulations as are deemed necessary to protect the life and health of the people in their jurisdiction. Rabies is an infectious, and fatal disease, and a local board can make such regulations as they deem best to prevent it. To require all dogs running at large, to be muzzled is in the nature of quarantine. As there might be a question as to the power of a local board, to provide penalties, it would be better, for the city or town council by an ordinance, to provide that all dogs found running at large without a muzzle in violation of regulations of the local board shall be shot. This the council may do.

In January last, a dog belonging to A, supposed to be mad, bit a dog belonging to B, and was subsequently killed five miles distant, having bitten several other animals. B's dog is still running at large. Is there some law, or regulation of the State Board by which B. can be compelled to kill his dog.

ANS. A local board may make such regulations as they deem necessary to protect the lives of the people of their community against the ravages of rabid dogs, by requiring all dogs running at large to be securely muzzled, otherwise to take their chances of the well directed aim of a rifle or revolver. In the case put, the fact that the dog of B. is now running about is conclusive evidence that he is not now rabid, though he may possibly become so. The incubation period of rabies is uncertain. The shortest is three days; the longest fourteen months. The majority of cases occur between the third and eighth week. Whatever the time, the owner of a dog, with reasonable watchfulness, has ample time in which to protect against danger, by studying the primary symptoms of the disease, which generally last two or three days, when the dog should be securely restrained, beyond the possibility of access by any person, until death or recovery. No dog suspected of rabies should be killed, if he can be restrained. If summarily killed it leaves the people in a terror of suspense, and uncertainty, for months. If restrained, a few days will determine the matter beyond question, and if it shall prove to be rabies, then the necessary precautionary measures can be taken with animals known to have been bitten.

Has a township local board of health authority to require dogs running at large to be muzzled, and to kill dogs found at large not muzzled?

ANS. In replying to this query, the following decisions of the attorney general are given as conclusive and binding, until set aside by the courts;

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STATE OF IOWA, OFFICE OF ATTORNEY GENERAL,
DES MOINES, July 10, 1891.

Mr. W. G. Ross, County Attorney, Fairfield, Iowa:

DEAR SIR:—I am in receipt of yours of the 23d ult., in which you ask my opinion on the following question:

"Have township trustees, acting as local boards of health, or otherwise, power to require all dogs found in the township to be muzzled or kept on the premises of the owner, under penalty of being shot?"

The portions of the statute which define the powers and duties of the local boards of health are section 16 of chapter 151 of the acts of the eighteenth general assembly, and section 415 of the Code, first adopted by chapter 107, acts of the eleventh general assembly. This latter section reads as follows:

"The township trustees shall have power to make whatever regulations they may deem necessary for the protection of the public health, and respecting nuisances, sources of filth and causes of sickness within their respective townships."

By this act, the township trustees are not created local boards of health by that name, although they are given ample powers as such. Chapter 151, eighteenth general assembly, is the one which creates the State Board of Health, giving that body general and paramount jurisdiction of health matters (Sec. 2), creating by name, city and town councils and township boards, local boards of health (Sec. 13) subordinate to the State Board (Sec. 15), and defining their powers as follows (Sec. 16): "Local boards of health shall make such regulations respecting nuisances, sources of filth, and cause of sickness, within their jurisdiction. * * * as they shall judge necessary for the public health and safety."

Section 25 of the act repeals all laws in conflict with it.

Such being the law, what are the powers of a local board of health with reference to protecting citizens within their jurisdiction from mad dogs by reasonable regulations? I think it may be questioned whether section 15, of chapter 151, acts of eighteenth general assembly, gives them any such power. By it they may make regulations "respecting nuisances, sources of filth and causes of sickness," but concerning nothing else. At a casual glance it might be seen that mad dogs, being "causes of sickness," viz: of the disease rabies, might be regulated, but this position is questionable, for it is a well known rule in the interpretation of statutes that when general words follow a list of particular ones, the meaning of the general words is restricted to things of the same genus or kind as those before enumerated (Sutherland on Statutory Construction, section 268).

The particular words being "nuisances and sources of filth," the "causes of sickness" that local boards of health have power to regulate are only those which are of the same general kind. Mad dogs are not nuisances in the ordinary legal acceptation of the term.

Section 415, however, gives, in my opinion unquestionably, the authority to restrain and regulate mad dogs to township boards. Its provisions are amply broad, the first clause giving board of trustees the power "to make whatever regulations they deem necessary for the protection of the public health." The remaining part of the section is virtually the same as the later statute, Sec. 16, above quoted. Certainly, such a regulation of dogs as you suggest, would be a regulation which might be deemed necessary for the protection of the public health. I am, therefore, of the opinion that township trustees may adopt and put in force such a regulation. A substantially similar power is given city and town councils by another statute, section 459 of the Code.

Decisions of the State Board.

It is true, that it may be contended that since chapter 151, 21st general assembly, is manifestly intended to cover the whole subject of health regulations; that, therefore, the previously existing statutes on the subject, including Sec. 415, have been supplanted and repealed by it. But repeals by implication are not favored. Statutes passed at different times and referring to the same subject are, if possible, construed together as one statute, and all the provisions of such given effect. The fact that there is an express repealing clause in chapter 151, does not affect the matter, for it provides only that "acts in conflict with this act are repealed." The general provision of Sec. 415, that "township" boards may pass whatever regulations they may deem necessary for the protection of the public health," is in conflict with no part of chapter 151. Further, it seems to me, that manifest reasons of public utility and safety would forbid the interpretation that the legislature intended to leave country districts without the power to protect themselves that is expressly granted to cities and towns.

Yours truly,
JOHN Y. STONE,
Attorney-General.

COUNCIL BLUFFS, IOWA, August 10, 1891.

O. C. Brown, Esq., County Attorney, Indianola, Iowa:

DEAR SIR:—I am in receipt of yours of July 30th, in which you state that a mad dog has bitten a number of cattle and horses in your county, some of which have gone mad, and others have been quarantined; that the owners are unwilling to kill the suspected animals, and asking what the powers and duties of the State Board of Health, and the township trustees, acting as a local board of health, are, in the premises.

There is no provision in the statute providing for the destruction of such animals and the compensation of the owners therefor, as there is in the case of glandered horses. The State Veterinary Surgeon is in all probability right in thinking that he has no jurisdiction. If, then, the power to remedy this evil is invested in any office or body, it is in the State Board of Health or the local board of health, under the following quoted provisions of the law: The State Board of Health has by virtue of chapter 151 of the acts of the eighteenth general assembly, the charge of all matters pertaining to quarantining and "authority to make such rules and regulations as they may deem necessary for the preservation and improvement of the public

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health." The police officers of the State are required to aid in the enforcement of such rules and regulations. The township boards of trustees, acting as local boards of health, are by virtue of section 415 of the Code, given substantially similar power. "They have the power to make whatever regulations they may deem necessary for the preservation of the public health." Sections 418 and 419 provide that the board shall have power to employ persons to carry into effect regulations adopted by them, and that a violation of any of the rules shall constitute a misdemeanor and be punishable as such.

These powers are general and broad, and there seems to be no limit to their exercise, providing they do not trench upon or conflict with the constitution or laws of the State. Any rule or regulation which the State board, or the local board might, in their exercise of their official discretion, deem necessary for the preservation of the public health, should, I think, be *prima facie* valid at least. The question as to whether any particular regulation, such as the one aimed at the evil referred to in your letter, is necessary, and therefore valid, would be a matter for the official discretion of the board passing the regulation.

The further question as to whether there would be any review by the courts or otherwise of this discretion is one that in the present state of judicial decisions, I am unable to venture an opinion on. The law seems to have vested the State board with wider powers in such matters than the local boards, but has not provided as efficient means for the enforcement of the regulations adopted by it as it has in the case of the local boards.

Yours truly,

(Signed) JNO. Y. STONE,
Attorney-General.

Health Laws.

HEALTH LAWS.

ADULTERATION OF FOOD, DRINK, AND MEDICINE.

[Chapter 170, Laws Nineteenth General Assembly.]

AN ACT to Prevent and Punish the Adulteration of Articles of Food, Drink, and Medicine, and the sale thereof when adulterated.

SECTION 1. *Be it enacted by the General Assembly of the State of Iowa,* That no person shall mix, color, stain, or powder, or order, or permit any other person to mix, color, stain, or powder any article of food with any ingredient or material so as to render the article injurious to health with the intent that the same may be sold, and no person shall sell or offer for sale any such articles so mixed, colored, stained, or powdered.

SEC. 2. No person shall, except for the purpose of compounding, in the necessary preparation of medicine, mix, color, stain, or powder, any drug or medicine with any ingredients or material so as to affect injuriously the quality or potency of such drug or medicine, with intent to sell the same, or shall offer for sale any such drug or medicine so mixed, colored, stained, or powdered.

SEC. 3. No person shall mix, color, stain, or powder any article of food, drink, or medicine, or article which enters into the composition of food, drink, or medicine, with any other ingredient or material, whether injurious to health or not, for the purpose of gain or profit, or sell or offer for sale, the same, or order or permit any other person to sell or offer for sale any article so mixed, colored, stained, or powdered, unless the same be so manufactured, used or sold, or offered for sale under its true and appropriate name, and notice that the same is mixed or impure is marked, printed or stamped upon each package, roll, parcel, or vessel containing the same, so as to be and remain at all times readily visible, unless the person purchasing the same is fully informed by the seller of the true names of the ingredients (if any than such as are known by the common name thereof) of such articles of food, drink, or medicine, at the time of making the sale thereof, or offering to sell the same. *Provided*, nothing in this section shall prevent the use of harmless coloring material used in coloring butter and cheese.

SEC. 4. No person shall mix any glucose, or grape sugar with syrup or sugar intended for human food; any cheese manufactured from skim milk, or from milk that is partly skimmed, shall be branded as skimmed milk cheese, when the same is offered for sale; or any oleomargarine, suine, beef fat, lard, or any other foreign substance, with any butter or cheese intended

for human food; or shall mix or mingle any glucose, grape sugar, or oleomargarine with any article without distinctly marking, stamping or labeling the article or the package containing the same, with the true and appropriate name of such article, and the percentage in which glucose or grape sugar, oleomargarine, or suine, enters into its composition. Nor shall any person sell, or offer for sale, or permit to be sold or offered for sale, any such food, into the composition of which glucose or grape sugar, oleomargarine, or suine has entered, without at the same time informing the buyer of the fact, and the proportions in which glucose or grape sugar, oleomargarine, or suine, has entered into the composition.

SEC. 5. Any person or persons convicted of violating any of the provisions of any of the foregoing sections of this act, shall for the first offense be fined not less than ten dollars ($10), nor more than fifty dollars ($50). For the second offense they shall be fined not less than twenty-five dollars ($25), nor more than one hundred dollars ($100), or confined in the county jail not more than thirty days. And for the third, and all subsequent offenses, they shall be fined five hundred dollars ($500), nor more than one thousand dollars ($1000), and imprisonment [ed] in the State prison not less than one year nor more than five years.

SEC. 6. All acts or parts of acts inconsistent with the provisions of this act are hereby repealed.

Approved, March 25, 1882.

SEC. 4036. If any person fraudulently adulterate, for the purpose of sale, any drug or medicine, in such manner as to lessen the efficacy, or change the operation of such drugs or medicine, or to make them injurious to the health or sell them knowing that they are thus adulterated, he shall be punished by imprisonment in the county jail not exceeding one year, or by fine not exceeding five hundred dollars, and such adulterated drugs and medicines shall be forfeited and destroyed.—*Code of 1873.*

SEC. 4037. If any person fraudulently adulterate, for the purpose of sale, any substance intended for food, or any wine, spiritous or malt liquor, or other liquor intended for drinking, he shall be punished by imprisonment in the county jail not more than one year, or by fine not exceeding three hundred dollars, and the article so adulterated shall be forfeited and destroyed.—*Code of 1873.*

SEC. 4038. If any apothecary, druggist or other person, sell and deliver any arsenic, corrosive sublimate, prussic acid, or any poisonous liquid or substance, without having the word "poison" and the true name thereof written or printed upon the label attached to the vial, box or parcel containing the same, he shall be punished by imprisonment in the county jail not more than thirty days, or by fine not exceeding one hundred dollars. Any person who may dispose of at retail, any poisonous substance or liquid to any one, for any purpose, is hereby required to enter in a book, to be kept by such apothecary, druggist or other person so disposing, the name of the poison, when bought, by whom and for what purpose; and if the person who calls for such poison is not personally known to the vender, then such person

shall be identified by some one known to the vender, whose name shall also be entered in such book. Any failure to comply with the requirements of this provision shall subject the party so failing to imprisonment in the county jail not more than thirty days, or a fine not exceeding one hundred dollars. —*Code of 1873.*

SEC. 4040. If any person wilfully sell, or keep for sale intoxicating, malt or vinous liquors, which have been adulterated or drugged by admixture with any deleterious or poisonous substance, he shall be deemed guilty of a felony, and upon conviction thereof, he shall be punished by a fine not exceeding five hundred dollars, or by imprisonment in the penitentiary not exceeding two years.—*Code of 1873.*

FRAUDULENT BUTTER AND CHEESE.

[Chapter 22, Laws of 1886.]

AN ACT to prevent deception in the manufacture and sale of imitations of Butter and Cheese.

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

SECTION 1. That for the purposes of this act every article, substance or compound other than that produced from pure milk or cream from the same made in the semblance of butter and designed to be used as a substitute for butter made from pure milk or cream from the same is hereby declared to be imitation butter; and that for the purposes of this act every article, substance or compound other than that produced from pure milk or cream from the same made in the semblance of cheese and designed to be used as a substitute for cheese made from pure milk or cream from the same is hereby declared to be imitation cheese; *provided* that the use of salt, rennet, and harmless matter for coloring the product of pure milk or cream, shall not be construed to render such product an imitation.

SEC. 2. Each person who manufactures imitation butter or imitation cheese shall mark by branding, stamping or stenciling upon the top and sides of each tub, firkin, box or other package in which such article shall be kept and in which it shall be removed from the place where it is produced, in a clear and durable manner, in the English language, the name of the contents thereof as herein designated, in printed letters of plain Roman type each of which shall be not less than one inch in length by one-half of one inch in width. Every person who by himself or another violates the provisions of this section shall be deemed guilty of a misdemeanor and upon conviction thereof shall be fined not to exceed two hundred and fifty dollars or by imprisonment in the county jail not to exceed sixty days.

SEC. 3. No person by himself or another shall knowingly ship, consign or forward by any carrier whether public or private any imitation butter or imitation cheese, unless the same be marked as provided by section two of this act; and no carrier shall knowingly receive for the purpose of forwarding or transporting any imitation butter or imitation cheese, unless it shall be

marked as hereinbefore provided, consigned, and by the carrier receipted for by its name as designated by this act; provided that this act shall not apply to any goods in transit between foreign States and across the State of Iowa.

SEC. 4. No person shall knowingly have in his possession or under his control any imitation butter or imitation cheese unless the tub, firkin, box or other package containing the same be clearly and durably marked as provided by section two of this act; *provided*, that this section shall not be deemed to apply to persons who have the same in their possession for the actual consumption of themselves or family.

SEC. 5. No person by himself or another shall knowingly sell or offer for sale imitation butter or imitation cheese under the name of, or under the pretense that the same is pure butter or pure cheese; and no person by himself or another shall knowingly sell any imitation butter or imitation cheese unless he shall have informed the purchaser distinctly at the time of the sale, that the same is imitation butter or imitation cheese as the case may be and shall have delivered to the purchaser at the time of sale a statement clearly printed in the English language which shall refer to the article sold and which shall contain in prominent and plain Roman type the name of the article sold as fixed by this act and shall give the name and place of business of the maker.

SEC. 6. No keeper of a hotel, boarding house, restaurant or other public place of entertainment shall knowingly place before any patron for use as food any imitation butter or imitation cheese unless the same be accompanied by a placard containing the name in English of such articles as fixed by this act, printed in plain Roman type. Each violation of this section shall be deemed a misdemeanor.

SEC. 7. No action can be maintained on account of any sale or other contract made in violation of or with intent to violate this act by or through any person who was knowingly a party to such wrongful sale or other contract.

SEC. 8. Every person having possession or control of any imitation butter or imitation cheese which is not marked as required by the provisions of this act shall be presumed to have known during the time of such possession or control the true character and name as fixed by this act of such imitation product.

SEC. 9. Whoever shall deface, erase, cancel or remove any mark provided for by this act, with intent to mislead, deceive or to violate any of the provisions of this act, shall be deemed guilty of a misdemeanor.

SEC. 10. Whoever shall violate any of the provisions of the third, fourth and fifth sections of this act shall, for the first offense, be punished by a fine of not less than fifty dollars nor more than one hundred dollars, or by imprisonment not exceeding thirty days, and for each subsequent offense shall be punished by a fine of not less than two hundred and fifty dollars nor more than five hundred dollars, or by imprisonment in the county jail not less than thirty days nor more than six months, or by both such fine and imprisonment in the discretion of the court.

SEC. 11. The governor shall, within thirty days from the taking effect of this act, by and with the *advise* [advice] and consent of the executive council,

appoint an officer who shall be known as the State Dairy Commissioner, who shall have practical experience in the manufacture of dairy products; the term of office of such commissioner shall commence on the first day of May, A. D. 1886, and shall continue two years. Said commissioner shall give an official bond conditioned for the faithful performance of the duties of his office in the sum of ten thousand dollars with sureties to be approved by the governor. He may be removed from office by the governor, with the approval of the executive council, for neglect or violation of duty. Any vacancy shall be filled by the appointment of the governor, by and with the advice and consent of the executive council.

SEC. 12. The State dairy commissioner shall receive a salary of fifteen hundred dollars per annum, payable monthly, and the expenses necessarily incurred in the proper discharge of the duties of his office; *provided*, that a complete itemized statement of all expenses shall be kept by the commissioner, and by him filed with the auditor of state, after having been duly verified by him before receiving the same. He shall be furnished a room in the agricultural department of the capitol at Des Moines, in which he shall keep his office, and all correspondence, documents, records and property of the State, pertaining thereto, all of which shall be turned over to his successor in office. He may, if it is found to be necessary, employ a clerk whose salary shall not exceed the sum of fifty dollars per month. Said salaries and expenses to be paid from the appropriation provided for in section seventeen of this act. The commissioner provided for by this act shall hold no other official position under the laws of Iowa, or a professorship in any of the State institutions.

SEC. 13. It shall be the duty of the State dairy commissioner to secure, so far as possible, the enforcement of this act. He shall collect, arrange and present in annual report to the governor on or before the first day of November of each year, a detailed statement of all matters relating to the purposes of this act, which he shall deem of public importance, including the receipts and disbursements of his office. Such reports shall be published with the reports of the State agricultural society.

SEC. 14. The State dairy commissioner shall have power in all cases where he shall deem it important for the discharge of the duties of his office, to administer oaths, to issue supœnas for witnesses, and to examine them under oath, and to enforce their attendance to the same extent and in the same manner as a justice of the peace may now do, and such witnesses shall be paid by the commissioner the same fees now allowed witnesses in justice's courts.

SEC. 15. Whoever shall have possession or control of any imitation butter or imitation cheese contrary to the provisions of this act shall be construed to have possession of property with intent to use it as means of committing a public offense within the meaning of chapter 50 of title XXV, of the Code; *provided*, that it shall be the duty of the officer who serves a search warrant issued for imitation butter or imitation cheese, to deliver to the State dairy commissioner or to any person by such commissioner authorized in writing

to receive the same, a perfect sample of each article seized by virtue of such warrant, for the purpose of having the same analyzed and forthwith to return to the person from whom it was taken, the remainder of each article seized as aforesaid. If any sample be found to be imitation butter or imitation cheese it shall be returned to and retained by the magistrate as, and for, the purpose contemplated by section 4648 of the Code, but if any sample be found not to be imitation butter or imitation cheese, it shall be returned forthwith to the person from whom it was taken.

SEC. 16. It shall be the duty of the court in each action for the violation of this act to tax as costs in the cause, the actual and necessary expense of analyzing the alleged imitation butter or imitation cheese which shall be in controversy in such proceeding provided that the amount so taxed shall not exceed the sum of twenty-five dollars. It shall be the duty of the district or county attorney upon the application of the dairy commissioner, to attend to the prosecution in the name of the State of any suit brought for violation of any of the provisions of this act within his district, and in case of conviction he shall receive twenty-five per cent of the fines collected, which shall be in addition to any salary he may receive to be taxed as costs in the case.

SEC. 17. There is hereby appropriated for the purposes of this act the sum of twenty thousand dollars or so much thereof as shall be necessary, not more than one-half of which shall be drawn from the State treasury prior to the first day of July, A. D. 1887. The amount hereby appropriated shall be expended only under the direction and with the approval of the executive council. And all salaries, fees, costs and expenses of every kind incurred in the carrying out of this law shall be drawn from the sum so appropriated.

SEC. 18. Chapter 39 of the acts of the Eighteenth General Assembly of Iowa, and all acts and parts of acts in conflict with this act are hereby repealed.

SEC. 19. This act being deemed of immediate importance shall take effect and be in force from and after its publication in the Iowa State Register and Iowa Homestead, newspapers published at Des Moines, Iowa.

Approved March 27, 1886.

SEC. 4036. If any person knowingly sell to another, or knowingly deliver or bring to be manufactured, to any cheese or butter manufactory in this State any milk diluted with water; or in any way adulterated; or milk from which any cream has been taken, or milk commonly known as "strippings" with intent to defraud, or shall knowingly sell the milk, the product of a diseased animal or animals, or shall knowingly use any poisonous of deleterious material in the manufacture of cheese or butter, he shall, upon conviction thereof, be fined in any sum not less than twenty-five dollars nor more than one hundred dollars, and be liable in double the amount of damages to the person or persons, firm, association, or corporation, upon whom such fraud shall be committed.—*Code of 1873.*

FRAUDULENT CANNED GOODS.

[Chapter 174, Laws of Twenty-first General Assembly.]

AN ACT in Relation to Canned or Preserved Food.

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

SECTION 1. It shall hereafter be unlawful in this State for any packer of, or dealer in, hermetically sealed, canned or preserved fruits, vegetables, or other articles of food, to knowingly offer such canned or preserved articles for sale for consumption in this State, after October 1, 1886, unless the cans or jars which contain the same shall bear the name, address and place of business of the person, firm or corporation that canned or packed the articles so offered, or the name of the wholesale dealer in the State who sells or offers the same for sale, together in all cases with the name of the state, city, town or village, where the same were packed, plainly printed thereon, preceded by the words, "packed at," such name, address and place of business, shall be plainly printed on the label, together with a mark or term indicating clearly the grade or quality of the articles contained therein.

SEC. 2. All packers of, and dealers in soaked goods, or goods put up from products dried or cured before canning, shall, in addition to complying with provisions of section one of this act, causes to be plainly branded on the face of the label in good, legible type, one half of an inch in heighth, and three-eighths of an inch in width, the word "soaked."

SEC. 3. All goods packed prior to the passage of this act are exempted from the provisions of this act.

SEC. 4. Any packer or dealer who shall violate any of the provisions of this act shall be deemed guilty of a misdemeanor and punished by a fine of not more than fifty dollars for each offense in the case of retail dealers, and in case of wholesale dealers and packers by a fine not less than five hundred dollars nor more than one thousand dollars for each offense. The term "Packer" and "Dealer, as used in this act, shall be deemed to include any firm or corporation doing business as a dealer in or packer of the articles mentioned in this act. It shall be the duty of any board of health in this State, cognizant of any violation of this act, to inform the district attorney whose duty it shall be to institute proceedings against any person who is charged with a violation of the provisions of this act, and in case of conviction shall receive twenty-five per cent. of the fines actually collected which shall be in addition to any salary he may now receive under the law.

SEC. 5. The provisions of this act shall not apply to canned or condensed milk or cream.

SEC. 6. This act shall take effect October first, eighteen hundred and eighty-six.

Approved April 13, 1886.

Health Laws.

TO PREVENT FRAUD IN THE SALE OF LARD.

[Chapter 79, Laws of 1888.]

AN ACT to Prevent Fraud in the Sale of Lard, and to Provide Punishment for the Violation thereof.

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

SECTION 1. No manufacturer or other person or persons shall sell, deliver, prepare, put up, expose or offer for sale any lard, or any article intended for use as lard, which contains any ingredient but the pure fat of healthy swine, in any tierce, bucket, pail, package or other vessel or wrapper, or under any label bearing the words "pure," "refined," "family," or either of said words alone or in combination with other words of like import, unless every tierce, bucket, pail, package or other vessel, wrapper or label, in or under which said article is sold, delivered, prepared, put up, exposed or offered for sale, bears on the top or outer side thereof, in letters not less than one-half inch in length, and plainly exposed to view, the words "Compound Lard," and the name and proportion in pound and fractional parts thereof of each ingredient contained therein.

SEC. 2. Any person who violates any provision hereof shall be deemed guilty of a misdemeanor for each violation, and upon conviction thereof shall be fined for the first offense not less than twenty dollars nor more than fifty dollars, and every subsequent offense under this act shall be fined not less than fifty dollars nor more than one hundred dollars.

Approved March 10, 1888.

[Chapter 137, Laws of 1880.]

AN ACT to Prevent Fraud in the Sale of Lard in Certain Cases.

SECTION 1. *Be it enacted by the General Assembly of the State of Iowa*, That all persons or associations who shall engage in the business of selling lard rendered from swine that have died of hog-cholera, or other diseases, shall, before selling, or offering to sell any such lard, plainly stamp, print, or write upon the cask, barrel, or other vessel containing such lard, the words, "lard from hogs which have died from disease;" or, if sold without such cask, barrel, or other receptacles, the purchaser shall be informed that the lard is from hogs which have died of disease.

SEC. 2. For a violation of the provisions of the foregoing section, the offender shall, on convicton thereof, be punished by a fine of not less than five dollars, nor exceeding one hundred dollars, or imprisonment in the county jail not exceeding thirty days.

Health Laws.

PROTECTION OF PUBLIC HEALTH.

[Code of 1873.]

SECTION 4035. If any person knowingly sell any kind of diseased, corrupted, or unwholesome provisions, whether for meat or drink, without making the same fully known to the buyer, he shall be imprisoned in the county jail not more than thirty days, or by fine not exceeding one hundred dollars.

SEC. 4039. If any person inoculate himself or any other person, or suffer himself to be inoculated with small-pox within this State, or come within the State with the intent to cause the prevalence, or spread of this infectious disease, he shall be punished by imprisonment in the penitentiary not more than three years, or by fine not exceeding one thousand dollars, and imprisonment in the county jail not exceeding one year. [Or 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.] *Code of 1873 as amended by Chapter 102, Laws of 1884.*

SEC. 4041. If any person throw, or cause to be thrown, any dead animal into any river, well, spring, cistern, reservoir, stream or pond, he shall be punished by imprisonment in the county jail not less than ten nor more than thirty days, or by fine not less than five nor more than one hundred dollars. —*Code of 1873.*

SEC. 1539. It shall be unlawful for any person to sell, give away, by agent or otherwise, any spiritous or other intoxicating liquors, including wine or beer to any minor for any purpose whatever, unless upon the written order of his parent, guardian or family physician, or sell the same to any intoxicated person, or to any person who is in the habit of becoming intoxicated. —*Code of 1873.*

SEC. 4064. If any person run any threshing machine in this State without having two lengths of tumbling rods next the machine, together with the knuckles, or joints and jacks of the tumbling rods safely boxed and secured while the machine is running, he shall be deemed guilty of a misdemeanor, and be punished by fine of not less than ten nor more than fifty dollars, for every day or part of a day he shall violate this section; and any person who shall knowingly, permit either his own grain, or any that may be in his possession, or under his control, to be threshed by a machine the rods, knuckles, or joints of which are not boxed in accordance with the requirements of this section, shall be liable to a like fine, as that prescribed for the person running such machine, both of which fines may be recovered in an action brought before a court of contempt jurisdiction.—*Code of 1873.*—(1)

(1) This statute does not change the rule that a plaintiff cannot recover for injuries resulting from the negligence of another person, if his own negligence in any degree contributed directly to the injury. *32 Iowa, 146.*

Health Laws.

No person shall place in any of the waters of this State any lime, ashes, drug, or medicated bait, with intent thereby to injure, poison, or catch fish. Any person violating the provisions of this section shall be fined not less than five nor more than fifty dollars for the first offense, and for the second, or any subsequent offense, not less than twenty dollars, and shall stand committed until such fine is paid.—*Section 8, Chapter 50, Laws 1874.*

SEC. 1. It shall be the duty of any person owning or operating steam boilers in this State to provide such boilers with steam guage, safety-valve, and water guage, and keep the same in good order.

SEC. 2. Any person neglecting to comply with the provisions of this act shall be deemed guilty of a misdemeanor, and shall be punished by a fine not less than fifty, nor more than five hundred dollars.—*Chapter 14, Laws of 1874.*

SEC. 3869. If any person, with intent to produce the miscarriage of any pregnant woman, willfully administer to her any drug, or substance whatever, or with such intent use any instrument, or other means whatever, unless such miscarriage shall be necessary to save her life, he shall be imprisoned in the State prison for a term not exceeding five years, and be fined in a sum not exceeding one thousand dollars. (1.)—*Code of 1873, as amended by Chapter 19, Laws of the Nineteenth General Assembly.*

SEC. 3877. If any person mingle any poison with any food, drink, or medicine, with intent to kill or injure any human being, or willfully poison any spring, well, cistern, or reservoir of water, he shall be punished by imprisonment in the penitentiary not exceeding ten years, and by fine not exceeding ten thousand dollars.—*Code of 1873.*

SEC. 4. Any tramp who shall wantonly or maliciously, by means of violence, threats, or otherwise, put in fear any inhabitant of this State, or who shall enter any public building, house, barn or out-building belonging to any other person, with intent to commit some unlawful act, or who shall carry any fire-arm or other dangerous weapon, or who shall indecently expose his person, or who shall be found drunk and disorderly, or shall commit any offense against the laws of this State for which no greater punishment is provided, shall be guilty of a misdemeanor and on conviction thereof, shall be punished by imprisonment at hard labor in the county jail not exceeding thirty days, or by imprisonment in such jail in solitary confinement not exceeding ten days, nor less than three days.—*Chap. 43, Laws of 1890.*

(1) To cause death by abortion is in this State murder, independent of as well as under the statute, though there was no intent to cause the death of the woman.
The crime of attempting to produce miscarriage of a pregnant woman, is complete if the attempt is made at any time during pregnancy.
The jurisdiction is with the county in which the medicine intended to produce the miscarriage was administered, and not in that where the miscarriage took place. *25 Iowa, 128; 36 Iowa, 112; 40 Iowa, 260.*

Health Laws.

TOY PISTOLS.

[Chapter 78, Laws of Twentieth General Assembly.]

AN ACT to Prohibit the Selling or Giving Fire Arms to Miners.

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

SECTION 1. That it shall be unlawful for any person to knowingly sell, present or give any pistol or revolver, or toy pistol to any minor.

SEC. 2. Any violation of this act shall be punishable by a fine of not less than twenty-five, nor more than one hundred dollars, or by imprisonment in the county jail of not less than ten, nor more than thirty days.

Approved, March 29, 1884.

EFFECTS OF ALCOHOL AND STIMULANTS UPON THE HUMAN SYSTEM.

[Chapter 1, Laws of 1886.]

AN ACT to Provide for the Teaching and Study of Physiology and Hygiene with special reference to the Effects of Alcoholic Drinks, Stimulants and Narcotics upon the Human System, in the Public Schools and Educational Institutions of the State.

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

SECTION 1. That physiology and hygiene, which must in each division of the subject thereof include special reference to the effects of alcoholic drinks, stimulants and narcotics upon the human system, shall be included in the branches of study now and hereafter required to be regularly taught to and studied by all pupils in common schools and in all normal institutes, and normal and industrial schools and the schools at the Soldiers' Orphans' Home, and the Home for Indigent Children.

SEC. 2. It shall be the duty of all boards of directors of schools and of boards of trustees, and of county superintendents in the case of normal institutes, to see to the observance of this statute and make provision therefor and it is especially enjoined on the county superintendent of each county that he include in his report to the superintendent of public instruction the manner and extent to which the requirements of section one of this act are complied with in the schools and institutes under his charge, and the secretary of school boards in cities and towns is especially charged with the duty of reporting to the superintendent of public instruction as to the observance of said section one hereof, in their respective town and city schools, and only such schools and educational institutions reporting compliance, as above required, shall receive the proportion of school funds or allowance of public money to which they would be otherwise entitled.

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SEC. 3. The county superintendent shall not after the 1st day of July, 1887, issue a certificate to any person who has not passed a satisfactory examination in physiology and hygiene with especial reference to the effects of alcoholic drinks, stimulants and narcotics upon the human system, and it shall be the duty of the county superintendent as provided by section 1771 to revoke the certificate of any teacher required by law to have a certificate of qualification from the county superintendent if the said teacher shall fail or neglect to comply with section one of this act, and said teacher shall be disqualified for teaching in any public school for one year after such revocation, and shall not be permitted to teach without compliance.

Approved February 17, 1886.

BARBED WIRE AROUND SCHOOL HOUSES.

[Chapter 103, Laws of 1884.]

AN ACT to Prohibit the Use of Barbed Wire in Enclosing Public School Grounds.

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

SECTION 1. It is hereby made the duty of the board of directors of every independent district, and of every district township, to remove before the first day of September, 1884, any barb wire fence enclosing in whole or in part any public school grounds in such district, and it is also made the duty of any person owning or controlling any barbed wire fence within ten feet of any public school grounds to remove the same within the time herein named.

SEC. 2. Hereafter barb wire shall not be used in enclosing in whole or in part any public school building or the grounds upon which the same may stand; and no barbed wire shall be used for a fence or other purpose within ten feet of any public school grounds.

SEC. 3. For failure or neglect on the part of any board of directors of any independent district or of any district townships to carry out the provisions of this act any member of such board shall be fined on conviction not exceeding twenty-five dollars, any person violating the provisions of this act shall on conviction thereof, be fined not exceeding twenty-five dollars.

Approved March 29, 1884.

TO PREVENT RAILROAD ACCIDENTS.

[Chapter 148, Laws of 1876.]

AN ACT to Diminish Liability to Railroad Accidents, and to Punish Interference with, and Injury to, the Property of Railroad Companies.

SECTION 1. *Be it enacted by the General Assembly of the State of Iowa:* If any person shall throw any stone, or any other substance of any nature whatever, or shall present or discharge any gun, pistol, or other fire-arm at

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any railroad train, cars or locomotive engine, he shall be deemed guilty of a misdemeanor, and be punished accordingly.

SEC. 2. If any person not employed thereon, or not an officer of the law in the discharge of his duty, without the consent of the person having the same in charge, shall get upon, or off, any locomotive engine or car of any railroad company, while said engine or car is in motion; or elsewhere than at the established depots of such company, or who shall get upon, cling to, or otherwise attach himself to any such engine or car, for the purpose of riding upon the same, intending to jump therefrom when such engine or car is in motion, he shall be guilty of a misdemeanor, and be punished by fine not exceeding one hundred dollars, or by imprisonment not exceeding thirty days.

[Chapter 112, Laws of 1882.]

AN ACT to Further Diminish Liability to Railroad Accidents, etc.

SECTION 1. *Be it enacted by the General Assembly of the State of Iowa:* If any person shall willfully and maliciously uncouple or detach the locomotive or tender, or any of the cars of any railroad train, or shall in any manner aid, abet or procure the doing of the same, such person shall be punished by imprisonment in the State penitentiary not exceeding five years, or by fine not exceeding one thousand dollars, or both, at the discretion of the court.

SEC. 2. If any person shall unlawfully seize upon any locomotive, with, or without any express, mail, baggage, or other car attached thereto and run the same upon any railroad, or shall aid, abet or procure the doing of the same, such person shall be punished by imprisonment in the State penitentiary not exceeding ten years, or by fine not exceeding two thousand dollars, or both, at the discretion of the court.

SEC. 3. If any person shall, without permission from the proper authority, wrongfully take, or run any hand car upon any railroad in this State, he shall be deemed guilty of a misdemeanor, and on conviction thereof shall be fined not more than one hundred dollars, or imprisoned not more than thirty days at the discretion of the court; *provided*, that if by such unlawful use of any hand car, any locomotive or car is thrown from the track, or a collision be produced, or any person injured thereby, he shall on conviction, be imprisoned in the penitentiary for a term of not more than five years; *and provided further*, that if by reason of such unlawful use of any hand car, any person is killed, such person so offending shall be deemed guilty of manslaughter.

SEC. 4. If any person, not an employe upon the railroad shall wrongfully interfere with any automatic brake or bell rope upon any railroad car, or use the same for the purpose of stopping or in any way controlling the movement of the train [he] shall be subject to the penalty provided in section three of this act for the unlawful running of a hand car on any railroad; and any railroad conductor or brakeman on a railroad train shall have power to arrest such person so offending, and deliver him to some peace officer on the line of the railroad.

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[Chapter 104, Laws of 1884.]

AN ACT Concerning Bells and Steam Whistles on Locomotives,

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

SECTION 1. That a bell and a steam whistle shall be placed on each locomotive engine operated on any railway in this State, and said whistle shall be twice sharply sounded at least sixty rods before a highway crossing is reached, and after the sounding of the whistle the bell shall be rung continuously until the crossing is passed; *provided*, that at street crossings within the limits of incorporated cities or towns, the sounding of the whistle may be omitted, unless required by the council of the city or town, and the company shall also be liable for all damages which shall be sustained by any person by reason of such neglect.

SEC. 2. Every officer or employé of any railroad company who shall violate any of the provisions of this act shall be punished by fine not exceeding one hundred dollars for each offense.

Approved March 29, 1884.

[Chapter 163, Laws of 1884.]

AN ACT to Prevent Accidents at Railway Crossings.

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

SECTION 1. All trains run upon any railroad in this State, which intersects or crosses, or is intersected or crossed, by any other railroad upon the same level, shall be brought to a full stop at a distance not less than two hundred feet, nor more than eight hundred feet, from the point of intersection or crossing of such road, before such intersection or crossing is passed by any such train.

SEC. 2. Every engineer violating the provisions of the preceding section shall for each offense forfeit one hundred dollars to be recovered in an action in the name of the State of Iowa, for the benefit of the school fund, and the corporation on whose road such offense is committed, shall forfeit for each offense so committed, the sum of two hundred dollars to be recovered in a like manner.

Approved April 5, 1884.

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[Chapter 18, Laws of 1890.

AN ACT Requiring all Railroads, Corporations, Companies and Persons, Operating a Railroad and Doing Business in Iowa, to Equip All their Engines and Cars with Proper, Efficient and Safe Automatic Couplers and Brakes, and for Prescribing Penalties for Failure thereof.

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

SECTION 1. That it shall be unlawful for any corporation, company or person operating any line of railroad in this state, any car manufacturers or transportation company using or leasing cars, to put in use in this state any new cars or any cars that have been sent in to the shop or shops for general repairs, or whose draft rigging has to be repaired with a new draw bar or bars, that are not equipped with safety or automatic couplers to draw bars, such as will not necessitate the going between the ends of the cars to couple or uncouple them, but operated from the side of the car.

SEC. 2. That after January 1, 1895, it shall be unlawful for any corporation, company or persons operating a railroad, or any transportation company using or leasing cars of any description and used in the commerce of the country, or in the construction of railroads, to have upon any railroad in Iowa, for use in the transportation of freight or passengers any car that is not equipped with such safety automatic coupler as provided for in section 1 of this act.

SEC. 3. That it shall be unlawful for any corporation, company or person operating any line of railroad in this State, to use any locomotive engine upon any railroad or in any railroad yard in this State after the First Day of January, 1892, that is not equipped with a proper and efficient power brake, commonly called a "driver brake."

SEC. 4. That it shall be unlawful for any corporation, company or person operating a line of railroad in this state, to run any train of cars after the First Day of January, 1893, that shall not have in that train a sufficient number of cars with some kind of efficient automatic or power brakes so that the engineer upon the locomotive can control the train without requiring brakemen to go between the ends or on the top of the cars to use, as now, the common hand brake.

SEC. 5. Every railroad corporation, company or person operating a railroad in this state, and every person or persons using or leasing cars in the transportation business, or in building railroads, shall, and are by this act required to include in their annual report to the state railroad commissioners the number of locomotive engines and cars used in this state and what number is equipped with automatic power brakes and what number of cars equipped with automatic safety couplers and the kind of brakes and couplers used and the number of each kind, when more than one kind is used.

SEC. 6. Any corporation, company or person operating a railroad in this State, and using a locomotive engine, or running a train of cars, or using any freight, way or other car, contrary to the provisions of this act, shall be

deemed guilty of a misdemeanor, and shall be subject to a fine of not less than five hundred dollars, or not more than one thousand dollars, for the benefit of the school fund, for each and every offense, provided the penalties on this section shall not apply to companies in hauling cars belonging to railroads other than those of this State, which are engaged in inter-state traffic, and any railroad employé who may be injured by the running of such engine, or train, or car contrary to the provisions of this law, shall not be considered as waiving his right to recover damage by continuing in the employ of such corporation, company or person running such engine or trains, or cars contrary to this law.

Approved, April 5, 1890.

REGULATING THE PRACTICE OF MEDICINE.

[Chapter 104, Laws of 1886.]

AN ACT to Regulate the Practice of Medicine and Surgery in the State of Iowa.

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

SECTION 1. That every person practicing medicine, surgery or obstetrics, in any of their departments, within this State, shall possess the qualifications required by this act. If a graduate in medicine, such person shall present his or her diploma to the State board of examiners, for verification as to its genuineness. If the diploma is found genuine, and is issued by a medical school legally organized and of good standing, of which the State board of examiners shall determine, and if the person presenting and claiming such diploma be the person to whom the same was originally granted, then the State board of examiners shall issue its certificates to that effect, signed by not less than five physicians thereof, representing one or more physicians of the schools on the board, and such certificate shall be conclusive as to the right of the lawful holder to practice medicine, surgery and obstetrics within this State. If not a graduate, the person practicing medicine or surgery within this State, unless he or she shall have been in continuous practice in this State for a period of not less than five years, of which he or she shall present to the State board of examiners satisfactory evidence in the form of affidavits, shall appear before said State board of examiners, and submit to such examination as said board may require. All examinations shall be conducted in writing, and all examination papers, together with the reports, and action of the examiners thereon, shall be preserved as the records of said board for a period of five years, during which time they shall remain open for inspection at the office of said State board of examiners. Such examinations shall be in anatomy, physiology, general chemistry, pathology, therapeutics and the principles and practice of medicine, surgery and obstetrics. *Provided*, that each applicant upon receiving from the secretary of the board an order for an examination shall receive

also a confidential number, which he or she shall place upon his or her examination papers, so that when said papers are passed upon by the examiners, the latter shall not know by what applicant said papers have been prepared. That upon each day of examination all candidates be given the same set or sets of questions. It is further provided that the examination papers shall be marked upon the scale of one hundred (100), and that in order to secure a license it shall be necessary for the applicant to attain such average as shall hereafter be determined by the State board of examiners, and if such examination be satisfactory to at least five physicians of said board, representing the different schools of medicine on the board, the board shall issue a certificate which shall entitle the lawful holder thereof to all the rights and privileges herein provided, and the physicians and the secretary of the State Board of Health shall constitute and be deemed a board of examiners for the purpose of this act.

SEC. 2. The State board of examiners shall procure a seal within sixty days after the passage of this act, and through the secretary of said board shall receive applications for certificates and examinations. The president, or any member of the board, shall have the authority to administer oaths and take testimony in all matters relating to their duties as examiners aforesaid. The board shall provide three forms of certificates; one for persons in possession of genuine diplomas, one for candidates examined by the board, and one for persons who have practiced medicine or surgery in any of its departments for five years as provided in this act. Said certificates shall be signed by not less than five physicians of the board, and this number may act as an examining board in the absence of the full board: Provided that one or more members of the different schools of medicine represented in the State Board of Health shall also be represented in the board of examiners. The board of examiners shall hold meetings at such places as will best accommodate applicants residing in different portions of the State, and at any such time as they shall deem best, and due notice of the time and place of such meetings shall be published.

SEC. 3. The board shall examine all diplomas submitted to them for such purpose to determine their genuineness and the rightful ownership of the person presenting the same. The affidavit of the applicant and holder of any diploma that he or she is the person therein named, and is the lawful possessor thereof, shall be necessary to verify the same, with such other testimony of [as] the board may require. Diplomas and accompanying affidavits may be presented in person or by proxy. If the diploma shall be found genuine, and in possession of the person to whom it was issued, the State board of examiners shall, upon the payment of a fee of two dollars, to the secretary of the board, issue a certificate to the holder of such diploma, and no further fee or sum shall be demanded or collected from said applicant by said board for such certificate. If the diploma shall be found to be fraudulent, or not lawfully in possession of the holder or owner thereof, the person presenting such diploma or holding or claiming possession thereof, shall be deemed guilty of a misdemeanor, and on conviction thereof, before any

court of competent jurisdiction, be fined not less than twenty dollars nor more than one hundred dollars.

SEC. 4. Every person holding a certificate issued by the State board of examiners, shall, within sixty days after the date of such certificate, have the same recorded in the office of the county recorder in the county wherein he resides, and should he remove from one county to another to practice medicine, surgery or obstetrics, his certificate must be recorded in the county to which he removes. The county recorder shall endorse upon the certificate the date of record, and he shall be entitled to charge and receive a fee of fifty cents for his services, the fee to be paid by the applicant.

SEC. 5. The county recorder shall record in a book provided for that purpose, a complete list of the certificates presented for record, and the date of their issue by the State board of examiners. If the certificate is issued by reason of a diploma, the name of the medical college conferring the same, and the date when conferred shall be recorded; and when such certificate shall have been granted upon the examination of the board, or because of five years' practice in the State, such fact shall be recorded Said records shall be open for inspection during business hours.

SEC. 6. Candidates for examination shall pay in advance to the secretary of the State board of examiners, a fee of ten dollars, which fee, together with the fees received for certificates, shall defray the entire expense of the aforesaid board of examiners, and the balance shall be turned over to the State treasurer for the benefit of the school fund, except such an amount as will pay each member of the board ten dollars ($10) per day during the time he is in actual attendance upon the session of the said board for the purpose of performing the duties required of him under this act, and, as will pay the secretary of the board such a salary as they may allow, not to exceed five dollars per day during the time he is actually engaged in performing the work of the board under this act, and each member of the board of examiners shall also receive a sufficient amount to defray his actual and necessary expenses while in the discharge of the duties herein provided. Any one failing to pass the required examination shall be entitled to a second examination within twelve months without fee, *provided* that any applicant for examination by notice in writing to the secretary shall be entitled to an examination within three months from the time of said notice and a failure to give such opportunity, shall entitle such applicant to practice without the certificate required by this act until the next regular meeting of said board. [*Provided further*, the board may also issue certificates to persons, who upon application present a certificate of having passed a satisfactory examination before any other State board of Medical Examiners, upon the payment of the fee provided in section three.] *

SEC. 7. The State board of examiners may refuse to grant a certificate to any person who has been convicted of a felony committed in the practice of his profession, or in connection therewith, or may revoke certificates for like cause, or for palpable evidence of incompetency, and such refusal or revocation shall prohibit such person from practicing medicine, surgery or obstetrics, provided, such refusal or revocation of a certificate can only be made

* Amended by Chapter 66, Laws of 1888.

with the affirmative vote of at least five physicians of the State board of examiners, in which number shall be included one or more members of the different schools of medicine represented in said board; and provided further, that the standing of a legally chartered medical college, from which a diploma may be presented, shall not be questioned, except by a like vote.

SEC. 8. Any person shall be deemed as practicing medicine, surgery or obstetrics or to be a physician within the meaning of this act, who shall publicly profess to be a physician, surgeon or obstetrician, and assume the duties, who shall make a practice of prescribing or of prescribing and furnishing medicides for the sick, or who shall publicly profess to cure or heal, by any means whatsoever, but nothing in this act shall be construed to prohibit students of medicine, surgery or obstetrics from prescribing under the supervision of preceptors, or gratuitous service in case of emergency, nor shall this act extend to prohibit women who are at this time engaged in the practice of midwifery nor to prevent the advertising, selling or prescribing natural mineral waters flowing from wells or springs nor shall this act apply to surgeons of the United States army or navy, marine hospital service, nor to physicians as defined herein who have been in practice in this State for five consecutive years, three years of which time shall have been in one locality; provided, such physician shall furnish the State board of examiners satisfactory evidence of such practice, and shall procure the proper certificate, as provided in this act, and for which certificate such physician shall pay the secretary of the State board of examiners a fee of two dollars, and said board shall issue to the applicant such certificate, nor shall this apply to registered pharmacists when filling prescriptions, nor shall it be construed to interfere with the sale of patent or proprietary medicines in the regular course of trade.

SEC. 9. Any person who shall practice medicine or surgery within this State, without having complied with the provisions of this act, and who is not embraced in any of the exceptions, or after being prohibited from so doing as provided in section 7 of this act, shall be deemed guilty of a misdemeanor, and shall on conviction thereof, be punished by a fine of not less than fifty nor more than one hundred dollars, or by imprisonment in the county jail not less than ten days nor more than thirty days.

SEC. 10. Any person who shall file, or attempt to file, with the State board of examiners, as his or her own, the diploma of another person, or who shall file, or attempt to file with the county recorder the certificate of another person, as his or her own, or who shall file or attempt to file a diploma or certificate with the true name erased therefrom and the claimant's name inserted, or who shall file or attempt to file any forged affidavit or identification, shall be deemed guilty of the crime of forgery.

SEC. 11. The penalties, as provided by this act; or violation thereof, shal not be enforced prior to the first day of January, A. D. 1877.

SEC. 12. All acts and parts of acts in conflict with this act are hereby repealed.

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TO REGULATE THE PRACTICE OF DENTISTRY.

[Chap. 36, Laws of 1882.]

AN ACT to Insure the Better Education of Practitioners of Dentistry in the State of Iowa.

SECTION 1. *Be it enacted by the General Assembly of the State of Iowa:* That it shall be unlawful for any person who is not at the time of the passage of this act engaged in the practice of dentistry in the State, to commence such practice unless such person shall have received a license from the board of examiners, or some member thereof as hereinafter provided, or a diploma from the faculty of some reputable dental college, duly authorized by the laws of the State, or by some other of the United States, or by the laws of some foreign country in which college or colleges, there was at the time of the issue of such diploma, annually delivered a full course of lectures and instructions in dental surgery.

SEC. 2. A board of examiners is hereby created, whose duty it shall be to carry out the purpose and enforce the provisions of this act. The members of such board shall be appointed by the governor, and shall consist of five practicing dentists, who shall have been engaged in the continuous practice of dentistry in the State for five years or over, at the time of or prior to the passage of this act. The term for which the members of said board shall hold their office shall be five years, except that the members of the board first appointed under this act shall hold their office for the term of one, two, three, four and five years, respectively, and until their successors shall be duly appointed. In case of vacancy occurring in said board, such vacancy may be filled by the governor.

SEC. 3. Said board shall choose one of its members president, and one the secretary thereof, and it shall meet at least once in each year, and as much oftener and at such time and place as it may deem necessary. A majority of said board shall at all times constitute a quorum, and the proceedings thereof shall at all reasonable times be open to public inspection.

SEC. 4. It shall be the duty of every person who is engaged in the practice of dentistry in this State, within six months from the date of the taking effect of this act, to cause his or her name and residence, or place of business, to be registered with the said board of examiners, who shall keep a book for that purpose, and every person who shall so register with said board as a practitioner of dentistry, may continue to practice the same as such without incurring any of the liabilities or penalties of this act.

SEC. 5. No person whose name is not registered on the books of said board as a regular practitioner of dentistry, within the limits prescribed in the preceding section, shall be permitted to practice dentistry in this State until such person shall have been duly examined by said board and regularly licensed in accordance with the provisions of this act.

SEC. 6. Any and all persons, who shall so desire, may appear before said board at any of its regular meetings and be examined with reference to their knowledge and skill in dental surgery, and if such person shall be found, after having been so examined, to possess the requisite qualifications, said board shall issue a license to such person to practice dentistry in accordance with the provisions of this act. But said board shall at all times issue to any regular graduate of any reputable dental college without examination, upon the payment by such graduate to said board of a fee of one dollar. All licenses issued by said board shall be signed by the members thereof and be attested by the president and secretary; and such license shall be *prima facie* evidence of the right of the holder to practice dentistry in the State of Iowa.

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SEC. 7. Any member of said board shall issue a temporary license to any applicant upon the presentation by such applicant of evidence of the necessary qualification to practice dentistry; and such temporary license shall remain in force until the next regular meeting of said board occurring after the date of such temporary license, and no longer.

SEC. 8. Any person who shall violate any of the provisions of this act shall be liable to prosecution, before any court of competent jurisdiction, upon information, and upon conviction shall be fined not less than twenty-five dollars nor more than fifty dollars for each offense.

SEC. 9. In order to provide the means for carrying out and maintaining the provisions of this act, the said board of examiners may charge each person applying to, or appearing before them for examination for license to practice dentistry, a fee of two dollars, and out of the funds coming into the possession of the board from the fee so charged, the members of said board may receive as compensation the sum of five dollars for each day actually engaged in the duties of their office. And no part of the salary or other expenses of the board shall ever be paid out of the State treasury. All moneys received in excess of said per diem allowance shall be held by the secretary of said board, he giving such bond as the board shall from time to time direct. The said board shall make an annual report of its proceedings to the governor, by the fifteenth of November of each year, together with an account of all moneys received and disbursed by them pursuant to this act.

SEC. 10. Any person who shall be licensed by said board to practice dentistry, shall cause his or her license to be registered with the county clerk of any county or counties in which such person may desire to engage in the practice of dentistry; and the county clerks of the several counties in the State shall charge for registering such license a fee of twenty-five cents for each registration. Any failure, neglect or refusal on the part of any person holding such license, to register the same with the county clerk as above directed, for a period of six months, shall work a forfeiture of the license; and no license, when once forfeited, shall be restored except upon the payment to the said board of examiners of the sum of twenty-five dollars, as a penalty for such neglect, failure or refusal.

SEC. 11. Nothing in this act shall be construed to prevent persons from extracting teeth.

PHARMACY LAW.

[Chapter 75, Acts of the Eighteenth General Assembly as Amended by Chapter 137, Acts of the Nineteenth General Assembly, Chapter 83, Acts of the Twenty-first General Assembly, Chapters 71, 81, and 106, Acts of Twenty-second General Assembly, and Chapter 36, Acts of the Twenty-third General Assembly, to Regulate the Sale of Medicines and Poisons.]

AN ACT to Regulate the Practice of Pharmacy, and the Sale of Medicines and Poisons.

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

SECTION 1. That from and after the passage of this act it shall be unlawful for any person, not a registered pharmacist within the meaning of this act, to conduct any pharmacy, drug store, apothecary shop or store for the purpose of retailing, compounding or dispensing medicines or poisons, and any person violating the provisions of this section shall be liable to pay a penalty of five dollars for each day of such violation and cost of prosecution. Suits brought to recover any of the penalties provided for in this act (chapter 71, laws of 1888) or the acts to which it is amendatory, shall be instituted in the name of the State of Iowa by the county attorney, or under the direction and by the authority of the Commissioners of Pharmacy for the State of Iowa. In all cases brought under this act (chapter 71, laws of 1888), or the acts to which it is amendatory, the prosecution need not prove that the defendant has not the required pharmacy certificate of registration; if the defendant has such certificate he must produce it.

SEC. 2. That it shall be unlawful for the proprietor of any store or pharmacy to allow any person except a registered pharmacist to compound or dispense the prescriptions of physicians, or to retail or dispense poisons for medical use, except as an aid to, and under the supervision, of a registered pharmarcist. Any person violating the provisions of this section shall be deemed guilty of a misdemeanor, and, on conviction thereof, shall be liable to a fine of not less than twenty-five dollars, nor more than one hundred dollars, for each and every such offense.

SEC. 3. The Governor, with the advice of the executive council, shall appoint three persons from among the most competent pharmacists of the State, all of whom shall have been residents of the State five years, and of at least five years' practical experience in their profession, who shall he known and styled as Commissioners of Pharmacy for the State of Iowa; one of whom shall hold his office for one year, one for two years, and the other for three years, and each until his successor shall be appointed and qualified; and each year thereafter another commissioner shall be so appointed for three years, and until a successor be appointed and qualified. If a vacancy occur in said commission, another shall be appointed, as aforesaid, to fill the unexpired term thereof. Said commissioners shall have power to make by-laws, and all necessary regulations for the proper fulfillment of their duties under this act, without expense to the State, except that the Secretary of

State is authorized to furnish said commissioners with stationery and blanks necessary for their office, and said commissioners are authorized to administer oaths, and take and certify the acknowledgments of instruments in writing.

SEC. 4. The commissioners of pharmacy shall register in a suitable book, the names and places of residence of all persons to whom they issue certificates, and dates thereof. Druggists and pharmacists who were registered without examination, shall not forfeit their registration when they have voluntarily sold, parted with, or severed their connections with the drug business for a period of two years, at the place designated in certificate of registration. Should such party wish to re-engage in the practice of pharmacy, he will not be required to be registered by examination, as per section 5. Provided, that registered pharmacists who remove to another locality and re-engage in the practice of pharmacy within a period of two years, and have paid to the commissioner of pharmacy the sum of one dollar on or before the 22d day of March of each year, as provided in this chapter, such registered pharmacists shall not be required to register by examination, but his former registration shall be in full force and effect. Every registered pharmacist who desires to continue his profession shall, on or before the 22d day of March, of each year, pay to the commission of pharmacy the sum of one dollar, for which he shall receive a renewal of his certificate, unless his name has been stricken from the register for violation of law. It shall be the duty of each registered pharmacist, before changing the locality as designated in his certificate of registration, to notify the secretary of the commission of pharmacy of his new place of business, and for recording the same and certification thereto the secretary shall be entitled to receive fifty cents for each certificate. It shall be the duty of every registered pharmacist to conspicuously post his certificate of registration in his place of business. Any person continuing in business, who shall fail or neglect to procure his annual renewal of registration, or who shall change his place of business without complying with this section, or who shall fail to conspicuously post his certificate of registration in his place of business, shall, for each such offense, be liable to a fine of ten dollars for each calendar month during which he is delinquent.

SEC. 5. That the said commissioners of pharmacy shall, upon application, and at such time and place and in such manner as they may determine, examine, either by a schedule of questions to be answered and subscribed to under oath, or orally, each and every person who shall desire to conduct the business of selling at retail, compounding or dispensing drugs, medicines or chemicals for medicinal use, or compounding or dispensing physicians' prescriptions as pharmacists, and if a majority of said commissioners shall be satisfied that said person is competent and fully qualified to conduct said business of compounding or dispensing drugs, medicines or chemicals for medicinal use, or to compound and dispense physicians' prescriptions, they shall enter the name of such person as a registered pharmacist in the book provided for in section 4 of this act; and that all graduates in pharmacy,

having a diploma from an incorporated college or school of pharmacy that requires a practical experience in pharmacy of not less than four years before granting a diploma, shall be entitled to have their names registered as pharmacists by said commissioners of pharmacy without examination.

SEC. 6. That the commissioners of pharmacy shall be entitled to demand and receive from each person whom they register and furnish a certificate as a registered pharmacist, without examination, the sum of two dollars; and for each and every person whom they examine orally, or whose answers to a schedule of questions are returned subscribed to under oath, the sum of five dollars, which shall be in full for all services. And in case the examination of said person shall prove defective and unsatisfactory, and his name not be registered, he shall be permitted to present himself for re-examination within any period not exceeding twelve months next thereafter, and no charge shall be made for such re-examination.

SEC. 7. Every registered pharmacist shall be held responsible for the quality of all drugs, chemicals and medicines he may sell or dispense, with the exception of those sold in the original packages of the manufacturer, and also those known as "patent medicines," and should he knowingly, intentionally and fraudulently adulterate, or cause to be adulterated, such drugs, chemicals and medical preparations, he shall be deemed guilty of a misdemeanor, and, upon conviction thereof, be liable to a penalty not exceeding one hundred dollars, and in addition thereto his name be stricken from the register.

SEC. 8. Pharmacists whose certificates of registration are in full force and effect, shall have the sole right to keep and to sell, under such regulations as have been or may be established from time to time by the commissioners of pharmacy, all medicines and poisons, excepting intoxicating liquors.

SEC. 9. It shall be unlawful for any person, from and after the passage of this act, to retail any poisons enumerated in schedules "A" and "B," except as follows:

SCHEDULE A.

Arsenic, and its preparations, corrosive sublimate, white precipitate, red precipitate, biniodide of mercury, cyanide of potassium, hydrocyanic acid, strychnia, and all other poisonous vegetable alkaloids, and their salts, essential oil of bitter almonds, opium and its preparations, except paregoric and other preparations of opium containing less than two grains to the ounce.

SCEDULE B.

Aconite, belladonna, colchicum, conium, nux vomica, henbane, savin, ergot, cotton root, cantharides, creosote, digitalis, and their pharmaceutical preparations, croton oil, chloroform, chloral hydrate, sulphate of zinc, mineral acids, carbolic acid and oxalic acid, without distinctly labeling the box, vessel or paper in which the said poison is contained, and also the outside cover or wrapper, with the name of the article, the word, "poison," and the

name and place of business of the seller. Nor shall it be lawful for any person to sell or deliver any poison enumerated in schedules "A" and "B" unless, upon due inquiry, it be found that the purchaser is aware of its poisonous character, and represents that it is to be used for a legitimate purpose. Nor shall it be lawful for any registered pharmacist to sell any poisons included in schedule "A" without, before delivering the same to the purchaser, causing an entry to be made, in a book kept for that purpose, stating the date of sale, the name and address of the purchaser, the name of the poison sold, the purpose for which it is represented by the purchaser to be required, and the name of the dispenser, such book to be always open for inspection by the proper authorities, and to be preserved for at least five years. The provisions of this section shall not apply to the dispensing of poisons, in not unusual quantities or doses, upon the prescriptions of practitioners of medicine. Nor shall it be lawful for any licensed or registered druggist or pharmacist to retail, or sell, or give away, any alcholic liquors or compounds as a beverage, and any violations of the provisions of this section shall make the owner or principal of said store or pharmacy liable to a fine of not less than twenty-five dollars, and not more than one hundred dollars, to be collected in the usual manner; and, in addition thereto, for repeated violations of this section, his name shall be stricken from the register.

SEC. 10 Any itinerant vender of any drug, nostrum, ointment or appliance of any kind, intended for the treatment of disease or injury, who shall, by writing or printing, or any other method, publicly profess to cure or treat disease, or injury, or deformity, by any drug, nostrum, or manipulation, or other expedient, shall pay a license of one hundred dollars per annum, to be paid to the treasurer of the commission of pharmacy. Whereupon the secretary of said commission shall issue such license for one year. Any person violating this section shall be deemed guilty of a misdemeanor, and shall, upon conviction, pay a fine of not less than one hundred nor more than two hundred dollars, all moneys received for license to be reported to the Auditor of State. The sum of two thousand dollars per year, or as much thereof as may be necessary, is hereby appropriated out of the moneys so received for licenses for the expenses of said commission, all exceeding said amount to be paid into the State treasury.

SEC. 11. That any person who shall procure, or attempt to procure, registration for himself or for another, under this act, by making, or causing to be made, any false representations, shall be deemed guilty of a misdemeanor, and shall, upon conviction thereof, be liable to a penalty of not less than twenty-five nor more than one hundred dollars, and the name of the person so fraudulently registered shall be stricken from the register. Any person, not a registered pharmacist, as provided for in this act, who shall conduct a store, pharmacy or place for retailing, compounding or dispensing drugs, medicines or chemicals, for medicinal use, or for compounding or dispensing physicians' prescriptions, or who shall take, use or exhibit the title of registered pharmacist, shall be deemed guilty of a misdemeanor, and, upon conviction thereof, shall be liable to a penalty of not less than fifty dollars nor more than two hundred dollars.

SEC. 12. Physicians dispensing their own prescriptions only, are not required to be registered pharmacists. Provided, that nothing in this act (chapter 83, laws 1886) shall prevent any person not a registered pharmacist or not holding a permit, from keeping and selling proprietary medicines, and such other domestic remedies as do not include any intoxicating liquors or poisons. Nor from selling concentrated lye and potash, provided, however, that if any person sell or deliver said concentrated lye or potash without having the word "poison" and the true name thereof written or printed upon a label attached to the vial, box or parcel containing the same, shall be punished by imprisonment in the county jail not more than thirty days, or by fine not exceeding one hundred dollars; but they shall not be compelled to register the sales of said lye and potash as required by section 4038, Code of 1873.

SEC. 13. This act, being deemed of immediate importance, shall take effect from and after its publication in the Iowa State Register and Iowa State Leader, newspapers published at Des Moines, Iowa.

SEC. 14. All acts and parts of acts in conflict with this act are hereby repealed.

Original act, chapter 75, approved March 22, 1880, published in the Iowa State Leader March 27, 1880, and the Iowa State Register March 31, 1880.

TO REGULATE COAL MINES.

[Chapter 21, Laws of 1884, as amended by Chapter 40, Laws of 1886; Chapter 52 Laws of 1888; and Chapter 46, Laws of 1890.

AN ACT to Repeal Sections 1, 2, 3, 4, 5 and 6, of Chapter 21, Acts of the Twentieth General Assembly, and enact substitutes therefor, providing for Mine Inspectors, their manner of appointment, compensation, and defining their duties and terms of office.

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

SECTION 1. That there shall be appointed by the governor, with the advice and consent of the senate, three inspectors of mines, who shall hold their offices for two years, the said inspectors subject, however, to be removed by the governor for neglect of duty, or malfeasance in office. Said term of office shall commence on the first day of April of each even numbered year. Said inspectors shall have a theoretical and practical knowledge of the different systems of working and ventilating coal mines, and of the nature and properties of the noxious and poisonous gases of mines and of mining engineering, and said inspectors before entering upon the discharge of their duties shall take an oath or affirmation to discharge the same faithfully and impartially, which oaths or affirmations shall be endorsed upon their commissions, and their commissions so endorsed shall be forthwith recorded in the office of the Secretary of State, and such inspectors shall each give bonds in the sum of two thousand (2,000) dollars, with sureties, to the approval of the

governor, conditioned for the faithful discharge of their duties. The governor shall divide the State into inspection districts and shall assign the inspectors to duty in such place or district as he shall deem proper.

SEC. 2. Said inspectors shall give their whole time and attention to the duties of their offices respectively, and shall examine all the mines in this State as often as their duties will permit, to see that the provisions of this act are obeyed, and it shall be lawful for such inspectors to enter, inspect and examine any mine in this State and the works and machinery belonging thereto, at all reasonable times by night or by day, but so as not to unnecessarily obstruct or impede the working of the mines, and to make inquiry and examination into the state and condition of the mine as to ventilation and general security as required by the provisions of this act. The inspectors shall make a record of all examinations of mines inspected by them showing the date when made, the condition in which the mines are found, the extent to which the laws relating to mines and mining are observed or violated, the progress made in improvement and secured by the provisions of this chapter, number of accidents, injuries or deaths in or about the mines, the number of mines visited, the number of persons employed in or about the mines, together with all such facts and information of public interest concerning the condition of mines as they may think useful and proper, or so much thereof as may be of public interest to be included in their biennial report. The owner and agents of all coal mines are hereby required to furnish the means necessary for such inspection, and it shall be the duty of the persons having charge of mines whenever any loss of life shall occur by accident connected with the workings of such mine to give notice forthwith by mail or otherwise to the inspector of mines of his district and to coroner of the county in which such mine is situated, and the coroner shall hold an inquest on the body of the person or persons whose death has been caused, and inquire carefully into the cause thereof, and shall return a copy of the verdict and all testimony to the said inspector. No person having a personal interest in or employed in the mine where a fatal accident occurs shall be qualified to serve on the jury empaneled on the inquest, and the owner or agent of all coal mines shall report to the inspector all accidents to miners in and around the mines, giving cause of same, such report to be made in writing and within ten days from the time any accident occurs.

SEC. 3. Said inspectors, while in office, shall not act as agents or managers or mining engineers, or be interested in operating any mine, and the inspector shall biennially on or before the 15th day of August preceding the regular session of the general assembly, make a report to the governor of their proceedings and the condition and operation of the mines in this State, enumerating all accidents in or about the same, and giving all such information as they may think useful and proper, and making such suggestions as they may deem important as to future legislation on the subject of mining.

SEC. 4. The inspectors provided for in this act shall each receive a salary of twelve hundred dollars ($1,200) per annum, payable monthly, and shall be furnished with necessary stationery and actual traveling expenses, not to exceed five hundred dollars ($500) per annum, *provided* that each

inspector shall file at the end of each quarter of his official year, with the auditor of state, a sworn statement of his actual traveling expenses incurred in the performance of his official duty for such quarter, the said salary and expenses to be paid by the State, as the salaries and expenses of other State officers are provided for. They shall have and keep an office in the capitol at Des Moines, in which shall be kept all records, correspondence, papers, apparatus and property pertaining to their duties belonging to the State, and which shall be handed over to their successors in office. And each inspector shall, during his term of office, have and keep a residence in the district to which he is assigned, without expense to the State; also, have and keep an office at a place designated by the governor, accessible to railroad and telegraph, in their respective districts, where at reasonable times, and when not actually engaged elsewhere, such inspectors shall be found.

SEC. 5. Any vacancy occurring in the office of inspector when the senate is not in session, either by death or resignation, removal by the governor or otherwise, shall be filled by appointment by the governor, which appointment shall hold good until his successor is appointed and qualified.

SEC. 6. There shall be provided for such inspectors all instruments necessary for the discharge of their duties under this act, which shall be paid for by the State, on the certificate of inspectors, and shall be the property of the State.

SEC. 7. The agent or owner of every coal mine shall make or cause to be made an accurate map or plan of the working of such mine on a scale of not less than one hundred feet to the inch, showing the area mined or excavated. Said map or plan shall be kept at the office of such mine. The agent or owner shall, on or before the first day of September of each year, cause to be made a statement and plan of the progress of the workings of such mine up to said date, which statement and plan shall be marked on the map or plan herein required to be made; in case of refusal on the part of said owner or agent for two months after the time designated to make the map or plan, or addition thereto, the inspector is authorized to cause an accurate map or plan of the whole said mine, to be made at the expense of the owner thereof, the cost of which shall be recoverable against the owner in the name of the person or persons making said map or plan, and the owner or agent of all coal mines hereafter wrought out and abandoned, shall deliver a correct map of said mine to the inspector, to be filed in his office.

SEC. 8. It shall be unlawful for the owner or agent of any coal mine worked by a shaft to employ or permit any person to work therein, unless there are to every seam of coal worked in such mine, at least two separate outlets, separated by natural strata of not less than one hundred feet in breadth, by which shafts or outlets distinct means of ingress or egress are always available to the persons employed in the mine, but in no case shall a furnace shaft be used as an escape shaft, and if the mine is a slope or drift opening, the escape shall be separated from the other openings by not less than fifty feet of natural strata, and shall be provided with safe and available traveling ways, and the traveling ways to the escapes in all coal mines shall

be kept free from water, and falls of roof, and all escape shafts shall be fitted with safe and convenient stairs, at an angle of not more than sixty degrees descent, and with landings at easy and convenient distances, so as to furnish easy escape from such mine; and all air shafts used as escapes where fans are employed for ventilation shall be provided with suitable appliances for hoisting the under ground workmen, said appliances to be always kept at the mine ready for immediate use, and in no case shall any combustible material be allowed between any escape shaft and hoisting shaft, except such as is absolutely necessary for the operation of the mine, provided that where a furnace shaft is large enough to admit of being divided into an escape shaft and furnace shaft, there may be a partition placed in said shaft, properly constructed so as to exclude the heated air and smoke from the side of the shaft used as an escape shaft, such partition to be built of incombustible material for a distance of not less than fifteen feet up from the bottom thereof, and, provided that where two or more mines are connected underground. Each owner may make joint provisions with the other for the use of the other's hoisting shaft or slope as an escape, and in that event the owners thereof shall be deemed to have complied with the requirments of this section, and, provided further, that in any case where the escape shaft is now situated less than one hundred feet from the hoisting shaft there may be provided a properly constructed underground traveling way from the top of the escape shaft, so as to furnish the proper protection from fire for a distance of one hundred feet from the hoisting shaft, and in that event the owner or agent of any such mine shall be deemed to have complied with the requirements of this section; and, provided further, that this act shall not apply to mines operated by slopes or drifts, openings where not more than five persons are employed therein; and, provided further, that any escapement shaft that is hereafter sunk and equipped, before said escapement shaft shall be located, or the excavation for it begun, the district inspector of mines shall be duly notified to appear and determine what shall be a suitable distance for the same. The distance from main shaft shall not be less than three hundred feet without the consent of the inspector, and no building shall be put nearer the escape shaft than one hundred feet, except the house necessary to cover the fan.

SEC. 9. In all mines there shall be allowed one year to make outlets as provided in section 8, when such mine is over two hundred feet in depth; but not more than twenty men shall be employed in such mine at any one time until the provisions of section eight are complied with; [provided that in the case of mines of over two hundred feet in depth, there shall be allowed three years on the condition that during the third year not more than ten men shall be employed in such mine at any one time, and provided further, that in cases where the two years shall already have expired, a third year shall be allowed after the taking effect of this act;] and after the expiration of the period above mentioned should said mines not have the outlets aforesaid, they shall not be operated until made to conform to the provisions of section eight. And provided further, that this act shall not apply to mines where

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the escape way is lost or destroyed by reason of the drawing of pillars preparatory to the abandonment of the mine; provided that not more than twenty persons shall be employed in said mine at the same time; and provided further, that ten men or less may be lawfully employed in any coal mine without reference to the provisions of this or any other act.—*Chapter 46, Laws of 1890.*

SEC. 10. The owner or agent of any coal mine, whether it be operated by shaft slope or drift, shall provide and maintain for every such mine an amount of ventilation of not less than one hundred cubic feet of air per minute for each person employed in such mine, and not less than five hundred cubic feet of air per minute for each mule or horse employed in the same, which shall be distributed and circulated throughout the mine in such manner as to dilute, render harmless and expel the poisonous and noxious gases from each and every working place in the mine, and whenever the inspector shall find men working without sufficient air or under any unsafe conditions he shall first give the operator or his agent a reasonable notice to rectify the same and upon refusal or neglect so to do the inspector may himself order them out until said portion of said mine shall be put in proper condition, and all mines governed by the provisions of this act shall be provided with artificial means for producing ventilation such as exhaust or forcing fans, furnaces or exhaust steam or other contrivances of such capacity and power as to produce and maintain an abundant supply of air for all the requirements of the persons employed in the mine; but in case a furnace is used for ventilating purposes it shall be built in such manner as to prevent the communication of fire to any part of the works by lining the upcast with incombustible material for a sufficient distance up from said furnace to insure safety.

SEC. 11. The owner or agent of every coal mine operated by a shaft or slope, in all cases where the human voice can not be distinctly heard, shall forthwith provide and maintain a metal tube, or other suitable means for communication from the top to the bottom of said shaft or slope, suitably calculated for the free passage of sound therein, so that communication can be held between persons at the bottom and top of the shaft, or slope, and there shall be provided a safety catch of approved pattern and a sufficient cover overhead on all carriages used for lowering and hoisting persons, and on the top of every shaft an approved safety gate and also an approved safety spring on top of every slope, and an adequate brake shall be attached to every drum or machine used for raising or lowering persons in all shafts or slopes, and a trail shall be attached to every train used on a slope, all of said appliances to be subject to the approval of the inspector.

SEC. 12. No owner or agent of any coal mine operated by shaft or slope shall knowingly place in charge of any engine used for lowering into or hoisting out of such mine persons employed therein, any but experienced, competent, and sober engineers, and no engineer in charge of such engine shall allow any person except such as may be deputed for that purpose by the owner or agent, to interfere with it, or any part of the machinery, and

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no person shall interfere, or in any way intimidate the engineer in the discharge of his duties, and the maximum number of persons to ascend out of, or descend into, any coal mine on one cage shall be determined by the inspector, but in no case shall such number exceed ten, and no person shall ride upon or against any loaded cage or car in any shaft or slope except the conductor in charge of the train.

SEC. 13. No boy under twelve years of age shall be permitted to work in any mine, and parents or guardians of boys shall be required to furnish an affidavit as to the ages of their boys when there is any doubt in regard to their age, and in all cases of miners applying for work the agent or owner of the mines shall see that the provisions of this section are not violated.

SEC. 14. In case any coal mine does not, in its appliances for the safety of the persons working therein, conform to the provisions of this act, or the owner or agent disregards the requirements of this act for twenty days after being notified by the inspector, any court of competent jurisdiction, while in session, or the judges in vacation, may, on application of the inspector, by civil action in the name of the State, enjoin or restrain by writ of injunction the said agent or owner from working or operating such mines with more persons at once than are necessary to make the improvements needed, except as provided in section eight and nine, until it is made to conform with the provisions of this act, and such remedies shall be cumulative, and shall not take the place of, or effect any other proceedings against such owner or agent authorized by law, for the matter complained of in such action, and for any willful failure or neglect to comply with the provisions of this law by any owner, lessee or operator of any coal mine or opening whereby any one is injured, a right of action shall accrue to the party so injured for any damage he may have sustained thereby, and in case of loss of life by reason of such willful neglect or failure aforesaid, a right of action shall accrue to the widow, if living, and if not living, to the children of the person whose life shall be lost, for like recovery of damages for the injury they shall have sustained.

SEC. 15. Any miner, workman or other person who shall knowingly injure or interfere with any air-course or brattice, or obstruct or throw open doors or disturb any part of the machinery, or disobey any order given in carrying out the provisions of this act, or ride upon a loaded car or wagon in a shaft or slope, except as provided in section twelve, or do any act whereby the lives and health of the persons or the security of the mines and machinery is endangered, or if any miner or person employed in any mine governed by the provisions of this act shall neglect or refuse to securely prop or support the roof and entries under his control, or neglect or refuse to obey any order given by the superintendent in relation to the security of the mine, in the part of the mine under his charge or control, every such person shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be punished by a fine not exceeding one hundred dollars or imprisonment in the county jail not exceeding thirty days.

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SEC. 16. Whenever written charges of gross neglect of duty or malfeasance in office against any inspector shall be made and filed with the governor, signed by not less than fifteen miners or one or more operators of mines, together with a bond in the sum of five hundred dollars payable to the State and signed by two or more responsible feeholders and conditioned for the payment of all cost and expenses arising from the investigation of such charges, it shall be the duty of the governor to convene a board of examiners to consist of two practical miners, one mining engineer and two operators, at such time and place as he may deem best, giving ten days' notice to the inspector against whom charges may be made, and also the person whose name appears first in the charges, and said board when so convened and having first been duly sworn or affirmed truly to try and decide the charges made, shall summon any witness desired by either party and examine them on oath or affirmation which may be administered by any member of the board and depositions may be read on such examination, as in other cases, and report the result of their investigations to the governor; and if their report shows that said inspector has grossly neglected his duties or is incompetent or has been guilty of malfeasance in office, it shall be the duty of the governor forthwith to remove said inspector and appoint a successor; and said board shall award the cost and expenses of such investigation against the inspector or person signing said bond.

SEC. 18. The owner, agent or operator of any coal mine shall keep a sufficient supply of timber, to be used as props, so that the workmen may at all times be able to secure the workings from caving in, and it shall be the duty of the owner, agent or operator to send down all such props when so required.

SEC. 19. Any person willfully neglecting or refusing to comply with the provisions of this act when notified by the mine inspector to comply with such provisions, shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be punished by a fine not exceeding five hundred dollars or imprisonment in the county jail not exceeding six months, except when different penalties are herein provided.

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SEC. 22. The executive council shall appoint a board of examiners, composed of two practical miners, two mine operators and one mining engineer, who shall have at least five years' experience in his profession. The members of said board shall be of good moral character, and citizens of the United State, and State of Iowa, and they shall before entering upon their duties take the following oath (or affirmation): I, ..., do solemnly swear (or affirm) that "I will perform the duties of examiner of candidates for the office of mine inspector to the best of my ability, and that in recommending any candidate I will be governed by the evidence of qualification to fill the position under the law creating the same, and not by any consideration of political or personal favors; that I will grant certificates to candidates according to their qualifications and the requirements of the law."

They shall hold their office for two years.

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SEC. 23. Said board shall meet biennially on the first Monday in April of each even numbered year, except that for the year 1888 said board shall meet on the second Monday, in the office of State Mine Inspector in the Capitol, and they shall publish in at least one newspaper published in each mining district of the State the date fixed by them for the examination of candidates. They shall be furnished with the necessary stationery and other necessary material for said examination, in the same manner as other State officers are now provided. They shall receive as compensation the sum of $5.00 per day for time actually employed in the duties of their office, and actual traveling expenses. The said compensation and expenses shall be paid in the same manner as the salaries and expenses of other State officers are now paid; *provided*, that in no case shall the per diem received by any member exceed $50.00 for each biennial session.

SEC. 24. Certificates of competency shall be granted only to citizens of the United States and State of Iowa, of good moral character, not less than twenty-five years of age, who shall have at least five years' experience in the mines, and who shall not have been acting as agent or superintendent of any mine for at least six months prior to their appearance for examination.

SEC. 25. The examination of candidates for the office of Mine Inspector shall consist of oral and written questions in theoretical and practical mining and mine engineering, on the nature and properties of noxious and poisonous gases found in mines, and on the different systems of working and ventilating of coal mines. The candidates shall not be allowed to have in their possession at the time of their examination any books, memoranda or notes, to be used as aids in said examination. The board of examiners shall give to all persons examined, who in their judgment possess the requisite qualifications, certificates of such qualification, and from the persons holding such certificates the Governor shall appoint the State Mine Inspector.

Approved April 12, 1888.

DRAINS, DITCHES AND WATER COURSES.

[Chapter 96, Laws of 1888.]

AN ACT to Repeal Chapter 188, Laws of the Twentieth (20") General Assembly and to Enact a Substitute Therefore Relating to Drainage.

Be it enacted by the General Assembly of the State of Iowa: SECTION 1. That Chapter 188, laws of the twentieth general assembly be repealed and the following enacted in lieu thereof: that whenever any person who is the owner of any swamp, wet or marsh land, which, on account of its condition, may endanger the public health or is not for that reason in a proper condition for cultivation shall desire to construct any tile or other underground drain through the land of another and shall be unable to agree with the owner or owners of such land as to the same, he may file with the clerk of the

township, where said land is situated, an application therefore, giving a description of the land or lands through which he may desire to construct the same, and the township clerk shall forthwith notify the township trustees of said township of said application, who shall fix a time and place for the hearing of same, which time shall not be more than twenty days distant, and they shall cause said clerk to notify the applicant and land owner of the time and place of said hearing, at least ten days before the time fixed for the hearing of same, which notice shall be in writing, signed by said clerk, and shall be served on said applicant and land owner, if within the county, and if not then upon his agent for said land, if within the county, in the same manner as is now provided by law for the service of original notices, and in case that neither said party nor his agent are residents within said county, then the same shall be served by posting written notices in three public places in said township, one of which shall be upon said land at least fifteen days before said hearing.

SEC. 2. That upon the day fixed for hearing, if said trustees are satisfied that the provisions of the prior section have been complied with, they may proceed to hear and determine the same and shall have power to adjourn from time to time until same is completed. Provided that no adjournment shall be for more than fifteen days.

SEC. 3. The said trustees may fix the point or points of entrance and exit or outlet of said tile or other under-ground drain on said land, the general course of same through said land, the size and depth of same, when the same shall be constructed, how kept in repair, what connections may be made with same, what compensation, if any, shall be made therefor, and any other question arising in connection with same; and they shall reduce their findings to writings which shall be filed with the clerk of said township, who shall record it in full in his book of records of said township, and said finding and decision shall be final unless appealed therefrom as hereinafter provided for.

SEC. 4. Wherever any water course or natural drainage line crosses the boundary line between two adjoining land owners and both parties desire to drain the land along such water course or natural drainage line, but are unable to agree upon the conditions as to the juncture or connection of the lines of tile or other drainage at the boundary line aforesaid, then and in such case the township trustees shall have full authority to hear and determine all questions arising relative thereto between such land owners and to render such judgment thereupon as shall to them seem just.

SEC. 5. Any person shall have the right to go upon any public highway to construct an outlet to a drain provided he shall leave the highway in as good condition as it was before the drain was constructed, to be determined by the supervisor of highways in the district where the work is done.

SEC. 6. That whenever any railroad crosses the land of any person or persons who desire to drain their land for any of the purposes set forth in Section one (1) of this Act, the party or parties desiring such drain or drains shall notify the railroad company by leaving a written notice with the nearest station agent, stating in such notice the starting point, route or termination of such drain or drains, and if the railroad company refuse or neglect for the space of thirty days to dig across their right of way a drain of equal depth and size of the one dug by the party who sishes [wishes] to drain his land, then the party who desires to drain the land may proceed to dig such drain and the railroad company shall be liable for the cost of the construction of such drain, to be collected in any court having jurisdiction.

SEC. 7. Either party may appeal to the district court of the county from all the findings of the township trustees, within ten days after the findings have been filed with the clerk, and the party appealing shall cause a notice in writing of the taking of said appeal upon the opposite party for the same time and in the same manner as now provided by law for service of original notice in the district court; and if the appellant is the party petitioning for the drain, he must furnish a bond conditioned to pay all the costs of appeal assessed against him, said bond to be approved by the township clerk; and the matter shall be tried *de novo* in said court; *provided*, that if the applicant does not recover a more favorable finding or judgment in the district court, than he did before the trustees, he will pay all costs of the appeal.

SEC. 8. In case of appeal the township clerk shall certify to the district court a transcript of the proceedings before said trustees, which shall be filed in said court with the appeal bond, the party appealing paying for said transcript and the docketing of said appeal, as in other cases, and upon appeal the party claiming damages shall be plaintiff and the applicant defendant.

SEC. 9. The applicant shall pay the costs of the trustees, clerk and serving of notices on the hearing before the trustees, and shall pay all damages awarded before entering on the construction of said tile or other drain through the lands of the other.

SEC. 10. In case any dispute shall arise as to repair of any tile or other underground drain the same shall be determined by said trustees in same manner as in the original construction of same.

[Chapter 55, Laws of 1886.]

AN ACT to allow Underground Tile Drain across Public Highway, and Defining the duties of Road Supervisors relative to the same, and Repeal Section 1225, Chapter 2, Title 10, of Code of Iowa.

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

SECTION 1. When any water course or natural drain crosses any public highway in the State of Iowa, and the adjoining or abutting land owner wishes to cross said highway with an underground tile drain for an outlet, or to connect with another underground tile drain, they shall notify the road supervisor having supervision over that public highway to be crossed,

in writing, specify the depth of drain and size of tile to be used in crossing said highway, and give the road supervisor twenty days' time to construct said underground tile drain.

SEC. 2. When the road supervisor receives said written notice, he shall order said underground tile drain constructed across said highway, and pay for the tile and construction of the same out of any money or fund in his command.

SEC. 3. If the supervisor fails to construct said underground tile drain within the twenty days' time, then the abutting or adjoining land owner may go upon the highway and construct said underground tile drain across said highway, and he shall receive pay for constructing the same, including tile used in crossing said highway, out of any money or fund belonging to such road district, provided he shall leave the highway in as good condition as it was before the drain was constructed.

SEC. 4. That section 1225, chapter 2, title 10, of the Code of Iowa, is hereby repealed.

Approved March 30, 1886.

[Chapter 139, Laws of 1886.]

AN ACT to Repeal Section 1214, Chapter 2, Title 10 of the Code, in relation to Drains and Ditches and to Enact a Substitute therefor.

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

SECTION 1. That section 1214 of chapter 2, title 10 of the Code, be and the same is hereby repealed and the following enacted in lieu thereof.

SEC. 1214. Whenever any such ditch, drain or change in the direction of any water-course, shall have been located and established, as provided in the preceding section, or when it shall be necessary to cause any such ditch, drains or water-courses to be reopened and repaired, the auditor shall commission and appoint six disinterested freeholders of the county, not interested in a like question, who shall within twenty days after such appointment, personally inspect and classify as "dry," "low," "wet" or "swamp," all land benefitted by the location and construction of such ditch, drain or water-course, or the repairing or reopening of the same, and shall make an equitable apportionment of the cost, expenses, cost of construction, fees and compensation for property appropriated or damages sustained by the construction of any such ditch, drain, change of direction of such water-course or of repairing and reopening the same, and make report thereof in writing to the board of supervisors, which apportionment shall accrue and be assessed among the owners of the land benefitted by the location, construction or the reopening and repairing of such ditch, drain or water-course, in proportion to the benefit to each of them through, along the line or in the vicinity of whose lands the same may be located, constructed or reopened and repaired, respectively, and the same may be levied

upon the lands of the owners so benefitted, in said proportions, and collected in the same manner that other taxes are levied and collected for county purposes, and the amounts so assessed and collected shall be paid out of the county treasury, from the funds collected for that purpose, on the order of the county auditor, and said commissioners shall receive for each day's service, when so engaged, two dollars, to be paid out of the funds so collected. Any such ditch, drain or water-course, which is now or may hereafter be constructed, so as to prevent the surplus and overflow waters from the adjacent land from entering the same, is hereby declared a nuisance and the same may be abated, as provided in title 20, chapter 5, of the Code of Iowa, and the diverting, obstructing, impeding or filling up of such drains, ditches or water-courses in any manner by any person, without legal authority, is hereby declared a nuisance, and any person convicted of such crime shall be punished as provided in title 24, chapter 15, of the Code for the punishment of nuisances. Nothing in this chapter contained shall be construed so as to prohibit any land owner from appealing from the order of the board in assessing his land, for any of the purposes mentioned in this section, to the circuit court of the county, in the same manner that appeals are taken in the location of highways, nor shall the same be construed so as to prohibit the maintenance of an action for the recovery of any taxes erroneously or wrongfully assessed, for any of the purposes mentioned in this section, and in order to show that such assessment was erroneous or wrongful, it shall only be necessary to prove that such lands so assessed were not benefitted by the location, construction or maintenance of such ditch, drain or water-course.

SEC. 1207. The board of supervisors of any county having a population of five thousand inhabitants, as shown by the last preceding census, may locate and cause to be constructed ditches or drains, or change the direction of any water-course in such county, whenever the same will be conducive to the public health, convenience or welfare.—*Code of 1873.* [This section was amended by the Seventeenth General Assembly, so as to authorize the drains to pass through two or more counties, and the appointment of commissioners from each county. The Eighteenth General Assembly further amended the law, providing that the work should be done under the supervision of a competent engineer. The Nineteenth General Assembly again changed the law, providing for the reclamation of bodies of wet land in a county by ditches, drains levees and embankments, to promote the public health, convenience or welfare, the work to be done by the county.]

INSPECTION OF KEROSENE OIL.

[Chapter 185, Acts of Twentieth General Assembly.]

AN ACT to provide for the inspection and to regulate the sale of petroleum and its products, and to repeal Chapter 172 of the Acts of the Seventeenth General Assembly, and Section 3901 of the Code as amended by Chapter 149, Laws of the Twenty-first General Assembly.

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

SECTION 1. That the governor, by and with the advice and consent of the senate, shall appoint a suitable person, resident of the State, who is not interested in manufacturing, dealing in, or vending any illuminating oils manufactured from petroleum, as State inspector of oils, whose term of office shall commence on the first day of April of each even-numbered year, and continue for the term of two years and until his successor is appointed and qualified. It shall be the duty of such State inspector, by himself or his deputies, hereinafter provided for, to examine and test the quality of all such oils offered for sale by any manufacturer, vender or dealer; and if, upon such testing or examination, the oils shall meet the requirements hereafter specified, he shall fix his brand or device. "*Approved flash test—degrees*" (inserting the number of derees) with the date over his official signature upon the package, barrel or cask containing the same. And it shall be lawful for the State inspector, or his deputies, to enter into or upon the premises of any manufacturer, vender or dealer of said oils, and if they shall find or discover any kerosene oil, or any other product of petroleum kept for illuminating purposes, that has not been inspected and branded according to the provisions of this act, they shall proceed to inspect and brand the same. It shall be lawful for any manufacturer, vender or dealer to sell the oil so tested and approved as an illuminator; but if the oil or other product of petroleum so tested shall not meet said requirements, he shall mark in plain letters on said package, barrel or cask, over his official signature, the words: "*Rejected for illuminating purposes, flash, test—degrees*" (inserting the number of degrees). And it shall be unlawful for the owner thereof to sell such oil or other product of petroleum for illuminating purposes. And if any person shall sell or offer for sale any of such rejected oil or other product of petroleum for such purpose, he shall be deemed guilty of a misdemeanor, and, upon conviction thereof, shall be subject to a penalty not exceeding three hundred dollars.

SEC. 2. The State inspector provided for in this act is authorized to appoint a suitable number of deputies, which deputies are empowered to perform the duties of inspection, and shall be liable to the same penalties as the State inspector; *provided*, that the State inspector may remove any of said deputies for reasonable cause. It shall be the duty of the inspector and his deputies to provide themselves, at their own expense, with the necessary

instruments and apparatus for testing the quality of said illuminating oils, and when called upon for that purpose to promptly inspect all oils heretofore mentioned, and to reject for illuminating purposes all oils which will emit a combustible vapor at a temperature of one hundred and five degrees standard Fahrenheit thermometer, closed test, provided the quality of oil used in the flash test shall not be less than one-half pint. The oil tester adopted and recommended by the Iowa State board of health shall be used by the inspector and his deputies in all tests made by them. And said board shall prepare rules and regulations as to the manner of inspection, which rules and regulations shall be in effect and binding upon the inspector and deputies appointed under this act.

SEC. 3. The State inspector before he enters upon the discharge of the duties of his office shall take the oath or affirmation provided by law, and file the same in the office of the secretary of State, and execute a bond to the State of Iowa in a penal sum of not less than twenty thousand dollars with sureties thereto, to be approved by the secretary of State, who shall justify as provided by law, and in addition thereto state under oath that they are not interested, directly or indirectly, in manufacturing, dealing in, or vending any illuminating oils, manufactured from petroleum; such bond to be conditioned for the faithful performance of the duties imposed upon him by this act, and which shall be for the use of all persons aggrieved by the acts of said inspector, or his deputies, and the same shall be filed with the secretary of State. Every deputy inspector shall take a like oath or affirmation prescribed herein for the State inspector, and execute to the State a bond in the penal sum of five thousand dollars with like conditions and for like purposes, and with sureties thereto who shall justify and have like qualifications as herein provided for the sureties for State inspector and such sureties shall be approved by the clerk of the district court of the county in which such deputy inspector resides, and said bond and oath shall be filed in the office of such clerk and such deputy inspector shall before entering upon the discharge of his duties forward said clerk's certificate of such filing to the secretary of State to be placed on file.

SEC. 4. All inspections herein provided for shall be made within the State of Iowa, and the inspector and deputy inspectors shall be entitled to demand and receive from the owner or party calling on him, or for whom he shall perform the inspection, the sum of ten cents per barrel, and for the purpose of this act a barrel shall be deemed fifty-five gallons.

SEC. 5. It shall be the duty of the State inspector and every deputy inspector to keep a true and accurate record of all oils so inspected and branded by him, which record shall state the date of inspection, the number of gallons rejected, the number of gallons approved, the number of gallons inspected, the number and kind of barrels, casks or packages, the name of the person for whom inspected and the amount of money received for such inspection, and such record shall be open to the inspection of all persons interested; and every deputy inspector shall return a true copy of such record at the beginning of each month to the State inspector. It shall

be the duty of the State inspector to make and deliver to the Governor for the fiscal period ending the 30th day of June, 1885, and every two years thereafter, a report of the inspections made by himself and deputies for such period, containing the information and items required in this act to be made of record, and the same shall be laid before the General Assembly.

SEC. 6. If any person or persons, whether manufacturer, vendee [er] or dealer shall sell or attempt to sell to any person in this State any illuminating oil, the product of petroleum, whether manufactured in this State or not, which has not been inspected as provided in this act, he shall be deemed guilty of a misdemeanor and subject to a penalty in any sum not exceeding three hundred dollars, and if any manufacturer, vender or dealer in either or any of said illuminating oils shall falsely brand the package, cask or barrel containing the same, as provided in this act, or shall refill-packages, casks or barrels having the inspector's brand thereon, without erasing such brand, having the oil inspected, and such packages, casks or barrels rebranded, he shall be deemed guilty of a misdemeanor, and shall be subject to a penalty not exceeding three hundred dollars, or be imprisoned in the county jail not exceeding six months or both in the discretion of the court.

SEC. 7. Any person selling or dealing in illuminating oils produced from petroleum who shall purchase, sell or dispose of any empty kerosene barrel, cask or package, before thoroughly cancelling, removing or effacing the inspection brand on the same, shall be guilty of a misdemeanor, and, on conviction thereof, shall pay a fine of one dollar for each barrel, cask or package thus sold or disposed of; and any person who shall knowingly use any illuminating oil, the product of petroleum for illuminating purposes, before the same has been approved by the State inspector of oils, or his deputy, shall be guilty of a misdemeanor, and, on conviction thereof, shall pay a fine in any sum not exceeding ten dollars for each offense.

SEC. 8. No person shall adulterate with paraffine or other substance, for the purpose of sale or for use, any coal or kerosene oils to be used for lights, in such a manner as to render them dangerous to use; nor shall any person knowingly sell or offer for sale, or knowingly use any coal or kerosene oil, or any product of petroleum, for illuminating purposes, which, by reason of being adulterated, or for any other reason, will emit a combustible vapor at a temperature of less than one hundred and five degrees of standard Fahrenheit thermometer, tested as provided in this act; *provided*, that the gas or vapor from said oils may be used for illuminating purposes when the oils from which said gas or vapor is generated are contained in closed reservoirs outside the building illuminated or lighted by said gas. Any person violating the provisions of this section shall be deemed guilty of a misdemeanor, and shall upon conviction thereof be punished by imprisonment in the county jail not more than one year, or by fine not exceeding $500, or by both such fine and imprisonment, in the discretion of the court; *Provided further*, that nothing in this act shall be so construed as to prevent the sale for and use in street lamps of lighter products of petroleum, such as gasoline, benzine, benzole, naptha, or to prevent the use of machines or generators constructed on the principal of the "Davy safety lamp."

SEC. 9. It shall be the duty of the State inspector, and of any deputy inspector, who shall know of the violation of any of the provisions of this act, to prosecute before a court of competent jurisdiction any person so offending. And in case the State inspector, or any deputy inspector, having knowledge of the violations of the provisions of this act, shall neglect to prosecute as required herein, he shall be deemed guilty of a misdemeanor, and punished accordingly, and, upon conviction shall be removed from office.

SEC. 10. No oil, nor fluid, whether composed wholly or in part of petroleum or its products, or of other substance or material, which will ignite and burn at a temperature of 300 degrees of the standard Fahrenheit thermometer, open test, shall be carried as freight, nor shall the same be burned in any lamp, or vessel, or stationary fixture of any kind, in any passenger, baggage, mail or express car on any railroad, nor on any passenger boat moved by steam power, nor in any street railway car, stage coach, omnibus or other public conveyance in which passengers are carried, within the State. Any violation of the provisions of this section shall be deemed a misdemeanor, and the offender shall, on conviction thereof, be fined not less than one hundred dollars, nor more than one thousand dollars, and shall be liable for all damages resulting therefrom.

SEC. 11. If any inspector or deputy shall falsely brand or mark any barrel, cask or package, or be guilty of any fraud, deceit, misconduct or culpable negligence in the discharge of his official duties, or shall deal in, or have any pecuniary interest, directly or indirectly, in any oils or fluids used or sold for illuminating purposes while holding such office, he shall be deemed guilty of a misdemeanor, and upon conviction thereof, shall be fined not exceeding one hundred dollars, or imprisoned not exceeding thirty days, and be liable to the party injured for all damages resulting therefrom.

SEC. 12. It shall be the duty of the governor to remove from office, and to appoint a competent person in the place of, any inspector who is unfaithful in the duty of his office.

SEC. 13. Any person who shall knowingly or negligently sell or cause to be sold any of the oils mentioned in this act for illuminating purposes, except for the purposes herein authorized, which are below the standard and test required in this act, shall be liable to any one purchasing said oil, or to any person injured thereby, for all damages resulting from any explosion of said oil.

SEC. 14. Within sixty days after the passage of this act the State Board of Health shall make and provide the necessary rules and regulations for the inspection of illuminating oil, and for the government of the inspector and deputy inspectors provided for in this act, and as contemplated by the provisions of this act, which shall be approved by the governor of the State, and when so approved shall be furnished by said board to the inspector

and his deputies. When written complaint shall be presented to the governor charging the inspector or any deputy with a failure or a refusal to comply with or carry out said rules and regulations, or any provision of this act, he shall investigate such charge, and if well founded and sustained, the person against whom said charges were made shall be removed from office by the governor without delay. Said rules and regulations may be changed or modified by said board, subject to approval of the governor, not oftener than once a year.

SEC. 15. Chapter 172, of the acts of the seventeenth general assembly, and section 3901, of the Code, are hereby repealed.

DISEASED ANIMALS.

[Chapter 189, Laws of 1884.]

AN ACT for the Appointment of a State Veterinary Surgeon and Defining his Duties.

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

SECTION 1. The governor shall appoint a State veterinary surgeon, who shall hold his office for the term of three years unless sooner removed by the governor; he shall be a graduate of some regular and established veterinary college, and shall be skilled in veterinary science; he shall be a member of the State Board of health, which membership shall be in addition to that now provided by law. When actually engaged in the discharge of his official duties he shall receive from the State treasury as his compensation the sum of five dollars per day and his actual expenses, which shall be presented under oath and covered by written vouchers before receiving the same.

SEC. 2. He shall have general supervision of all contagious and infectious diseases among domestic animals within or that may be in transit through the State, and he is empowered to establish quarantine against animals thus diseased, or that have been exposed to others diseased, whether within or without the State, and he may with the concurrence of the State board of health, make rules and regulations such as he may deem necessary for the prevention, against the spread, and for the suppression of said disease or diseases, which rules and regulations, after the concurrence of the governor and executive council, shall be published and enforced, and in doing said things he shall have power to call on any one or more peace officers, whose duty it shall be to give him all assistance in their power.

SEC. 3. Any person who wilfully hinders, obstructs or resists said veterinary surgeon or his assistants, or any peace officer acting under him or them when engaged in the duties or exercising the powers herein conferred, shall be guilty of a misdemeanor and punished accordingly.

SEC. 4. Said veterinary surgeon shall on or before the 30th day of June of each year, make a full and detailed report of all and singular his doings since his last report to the governor, including his compensation and

expenses, and the report shall not exceed one hundred and fifty pages of printed matter.

SEC. 5. Whenever the majority of any board of supervisors, city council, trustees of an incorporated town, or township trustees, whether in session or not, shall in writing notify the governor of the prevalence of, or probable danger from, any of said diseases, he shall notify the State veterinary surgeon who shall at once repair to the place designated in said notice and take such action as the exigencies may demand, and the governor may in case of emergency appoint a substitute or assistants, with equal powers and compensation.

SEC. 6. Whenever in the opinion of the State veterinary surgeon the public safety demands the destruction of any stock under the provisions of this act, he shall, unless the owner or owners consent to such destruction, notify the governor, who may appoint two competent veterinary surgeons as advisers, and no stock shall be destroyed except upon the written order of the State veterinary surgeon countersigned by them and approved by the governor, and the owners of all stock destroyed under the provisions of this act, except as hereinafter provided, shall be entitled to receive a reasonable compensation therefor; but not more than its actual value in its condition when condemned, which shall be ascertained and fixed by the State veterinary surgeon and the nearest justice of the peace, who if unable to agree shall jointly select another justice of the peace as umpire, and their judgment shall be final when the value of the stock does not exceed one hundred dollars, but in all other cases either party shall have the right to appeal to the circuit court, but such appeal shall not delay the destruction of the diseased animals. The State veterinary surgeon shall, as soon thereafter as may be, file his written report thereof with the governor, who shall, if found correct, endorse his findings thereon, whereupon the auditor of state shall issue his warrant therefor upon the treasurer of state who shall pay the same out of any moneys at his disposal under the provisions of this act; *provided*, that no compensation shall be allowed for any stock destroyed while in transit through or across the State, and that the word stock, as herein used, shall be held to include only neat cattle and horses.

SEC. 7. The governor of the State, with the State veterinary surgeon, may co-operate with the government of the United States for the objects of this act, and the governor is hereby authorized to receive and receipt for any moneys receivable by this State under the provisions of any act of Congress which may at any time be in force upon this subject, and to pay the same into the State treasury to be used according to the act of Congress and the provisions of this act as nearly as may be.

SEC. 8. There is hereby appropriated out of any moneys not otherwise appropriated the sum of ten thousand dollars for use in 1884 and 1885, and three thousand dollars annually thereafter, or so much thereof as may be necessary for the uses and purposes herein set forth.

SEC. 9. Any person, except the veterinary surgeons, called upon under the provisions of this act shall be allowed and receive two dollars per day while actually employed.

Approved April 14, 1884.

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[Chapter 156, Laws of 1886.]

AN ACT to amend Chapter 11, Title 24 of the Code, Relating to Contagious Diseases in Domestic Animals.

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

SECTION 1. That sections 4058, and 4059 in chapter 11, title 24 of the Code be hereby repealed, and sections 2 and 3 of this act be substituted therefor, and be it known hereafter as sections 4058 and 4059 of the Code.

SEC. 2. Be it enacted: "Section 4058. Any person or persons driving any cattle into this State, or any agent, servant or employé of any railroad or other corporation who shall carry, transport or ship any cattle into this State, or any railroad company, or other corporation or person who shall carry, ship or deliver any cattle into this State, or the owners, controllers, lessees, or agents or employés of any stock yards, receiving into such stock yards, or in any other enclosures, for the detention of cattle in transit, or shipment, or re-shipment or sale, any cattle brought or shipped in any manner into this State, which at the time they were either driven, brought, shipped or transported into this State were in such condition as to infect with or to communicate to other cattle, pleuro pneumo*in*[ni]a, or splenitic or Texas fever, shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be punished by a fine of not less than three hundred dollars and not more than one thousand dollars, or by both fine and imprisonment in the county jail not exceeding six months, in the discretion of the court.

SEC. 3. Be it enacted: "Section 4059. Any person who shall be injured or damaged by any of the acts of the persons named in section 4058, and which are prohibited by such section, in addition to the remedy therein provided, may bring an action at law against any such persons, agents, employés or corporations mentioned therein, and recover the actual damages sustained by the person or persons so injured, and neither said criminal proceeding nor said civil action, in any stage of the same, be a bar to a conviction or to a recovery in the other."

Approved April 10, 1886.

[Chapter 79, Laws of 1886, as amended by Chapter 67, Laws of 1888.]

AN ACT to Prohibit the Traffic in Hogs infected with Swine Plague or Hog Cholera, and to Prevent the Spread of the same.

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

SECTION 1. All traffic in swine which have died with the swine plague or hog cholera, or from other contagious or infectious diseases within the State is hereby prohibited and it shall be unlawful for any person to haul in any vehicle or public conveyance any dead hogs which have so died or known to

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be affected with such disease, upon any public road or highway or upon any enclosure other than that upon which said hogs have died.

SEC. 2. Any person having in his possession swine which have died from the swine plague, hog cholera or other infectious disease shall, within a reasonable time, cause the same to be burned or buried to the depth of at least thirty inches so as to prevent the spread of the disease.

SEC. 3. Any person violating or failing to comply with any provision of this act shall be deemed guilty of a misdemeanor, and upon conviction thereof, shall be punished by fine of not less than five dollars nor more than one hundred dollars, at the discretion of the court. [It shall be unlawful for any person negligently or willfully to allow his hogs, or those under his control, infected with hog cholera, or other plague, or contagious disease, to escape his control or run at large.—*Chapter 67, Laws of 1888.*]

SEC. 4055. If the owner of sheep, or any person having the same in charge knowingly import or drive into this State, sheep having any contagious disease, or turn out, or suffer any sheep having any contagious disease, knowing the same to be so diseased, to run at large upon any common highway, or unenclosed lands, or sell or dispose of any sheep, knowing the same to be so diseased, he shall be deemed guilty of a misdemeanor, and punished by a fine in any sum not less than fifty dollars nor more than one hundred dollars. —*Code of 1873.*

SEC. 4056. If any person knowingly import or bring within this State, any horse, mule or ass, affected by the disease known as nasal gleet, glanders or button-farcey, or suffer the same to run at large upon any common highway or uninclosed land, or use or tie the same in any public place, or off his own premises, or sell, trade, or offer for sale or trade, any such horse, mule or ass, knowing the same to be so diseased, he shall be deemed guilty of a misdemeanor, and shall, on conviction, be punished by a fine of not less than fifty dollars, nor more than five hundred dollars; and in default of payment shall be imprisoned for any period not exceeding twelve months, or by both fine and imprisonment, at the discretion of the court.—*Code of 1873.*

SEC. 4057. If any horse, mule or ass, reasonably supposed to be diseased with nasal gleet, glanders or button-farcey, be found running at large without any known owner, it shall be lawful for the finder thereof to take such horse, mule or ass, so found, before some justice of the peace, who shall forthwith cause the same to be examined by some veterinary surgeon, or other person skilled in such diseases, and if, on examination, it is ascertained to be so diseased, it shall be lawful for such justice of the peace to order such diseased animal to be immediately destroyed and buried; and the necessary expense accruing under the provisions of this act shall be defrayed out of the county treasury.—*Code of 1873.*

SEC. 1484. The sheriff, constable, police officer, officer of any society for the prevention of cruelty to animals, or any magistrate, shall destroy any horse or other animal having the disease called and known as glanders, or any disabled creature unfit for other use.—*Code of 1873.*

Health Laws.

CONFINEMENT OF PERSONS ALLEGED TO BE INSANE.

[Chapter 68, Laws of 1888.]

AN ACT to Amend Sections 1401 and 1403, of the Code, Relative to the Confinement of Persons Found or Alleged to be Insane.

SECTION 1. *Be it enacted by the General Assembly of the State of Iowa:* That section 1401, of the Code, be, and the same is hereby amended, by inserting after the word "fees," in the fortieth line, the following: "And no person during such investigation, or who shall be found to be insane, as above provided, shall during investigation or after such finding and pending commitment to the hospital for the insane, or when *en route* to said hospital, be confined in any jail or prison, or other place of solitary confinement; except in cases of extreme violence, when it may be deemed absolutely necessary for the safety of such insane person, or of the public; and if such violently insane person be so confined, there shall at all times during such confinement be some suitable person or persons in attendance in charge of such insane person; but at no time shall any female be placed in such confinement without at least one female attendant remaining in charge of such insane person."

SEC. 2. That section 1403, of the Code, be amended by adding to said section the words: "*Provided,* however, that any female that may be so confined in such poor house or jail shall be at all times under the personal care of a suitable female attendant, who shall hold a key of the apartment in which said insane person is confined."

Approved April 6, 1888.

SUPPORT OF FAMILIES OF INSANE PERSONS.

[Chapter 70, Laws of 1888.]

AN ACT to Provide for the Support of the Family of Insane Persons Out of Their Estate and to Amend Section 2276 of the Code.

SECTION 1. *Be it enacted by the General Assembly of the State of Iowa:* Amend section 2276 of the Code is hereby amended by adding thereto the following: The court shall, if necessary, set off to the wife, and children under fifteen years of age of the insane person or to either, sufficient of his property of such kind as it shall deem appropriate, to support them for twelve months from the time he was adjudged insane.

Approved April 12, 1888.

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TO PROTECT PASSENGERS ON SAIL AND STEAM BOATS.

[Chapter 107, Laws of 1888.]

AN ACT to Provide for the Greater Safety of Passengers on Board all Sail and Steam Boats on the Inland Waters of the State of Iowa.

SECTION 1. *Be it enacted by the General Assembly of the State of Iowa:* That from and after the taking effect of this act it shall be unlawful for any person as owner, agent or master of any sail or steamboat plying on the inland waters of this State, having a capacity to carry five persons or more, to hire such boat for the carrying of persons, or to receive passengers for carriage thereon for hire, without each year, before the boating season, and before its use, first obtaining a license for the said boat as hereinafter provided; and every person violating the provisions of this section shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be punished accordingly. *Provided,* that the provisions of this act shall not apply to any sail or steam boat duly licensed under laws of the United States during the term covered by such license.

SEC. 2. That the governor shall on or before the (2nd) second Monday in May in each year appoint such number of competent and suitable persons inspectors of boats as he may deem necessary, to serve until the second Monday in May of the next ensuing even numbered year, unless sooner removed by the governor. The person so appointed shall qualify by taking an oath to be endorsed on his certificate of appointment, to faithfully and honestly discharge the duties of his office.

SEC. 3. That it shall be the duty of any inspector upon demand of any owner, agent, or master of any sail or steamboat, having a capacity for the carrying of five passengers or more, plying upon the inland waters of the State, and upon payment to him of the fee hereinafter provided for, to thoroughly and carefully inspect such boat and all its machinery and appliances, and if such boat is found safe and suitable to be hired for the carrying of persons or for the carrying of passengers, to give to such owner, agent or master, a certificate to that effect, and certifying the number of persons that may be carried thereon; which certificate shall entitle such boat to be used for the carrying of passengers for the season from the date thereof; and said certificate or a copy thereof shall be posted in a conspicuous place on or in said boat. And any owner, agent, or master of such boat, knowingly permitting or receiving for carriage on such boat a greater number of persons than authorized in such certificate shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be punished by a fine not less than twenty dollars nor more than one thousand dollars.

SEC. 4. That it shall be unlawful for any person to act as pilot or engineer on any steamboat carrying passengers on the inland waters of this State, without first obtaining a license so to do as hereinafter provided. And any

person violating this provision shall be deemed guilty of a misdemeanor, and on conviction thereof shall be punished by a fine not less than twenty dollars nor more than five hundred dollars. That any person desiring license as such pilot or engineer shall apply therefor to some inspector appointed under this act whose duty it shall be, upon payment to him of the fee hereinafter provided for, to forthwith inquire into the competence of such applicant. If such applicant is found to be of sober habits, competent and capable of performing the duties of a pilot or engineer the inspector shall issue to such pilot or engineer, a certificate entitling him to act as such pilot or engineer, as the case may be, for five years from the date thereof, unless sooner revoked for good cause by some inspector of the State with the approval of the governor.

SEC. 5. That said inspector shall be entitled to charge the following fees and require payment thereof in advance: For each sail boat inspected ($1.00) one dollar; for each steam boat inspected ($10.00) ten dollars. Provided that steamers with capacity of twenty or less passengers shall be inspected for five dollars, whether the same be licensed or not, and for each application for license as pilot or engineer ($3.00) three dollars, whether a license be granted or not.

SEC. 6. Said inspectors shall report on or before January first of each year, to the governor of the State, the whole number of licenses, granted by them to pilots and engineers and to whom granted, the total number of sail boats and steam boats inspected by them, also the total amount of fees received by them for such licenses and inspection.

Approved April 12, 1888.

OFFENSES AGAINST PUBLIC POLICY.

SECTION 4087. If any two or more persons conspire or confederate together with the fraudulent or malicious intent wrongfully to injure the person, character, business or property of another, or to do any illegal act injurious to the public trade, health, morals, or police, or to the administration of public justice, or to commit any felony, they are guilty of a conspiracy, and every such offender, and every person who is convicted of a conspiracy at common law, shall be punished by imprisonment in the penitentiary not more than three years.—*Code of 1873.*

NUISANCES.

SECTION 4098. "The erecting, continuing, or using, any building, or other place, for the exercise of any trade, employment or manufacture, which by occasioning noxious exhalations, offensive smells, or other annoyances, becomes injurious to the public health, comfort, or property of individuals, or the public, *the causing or suffering any offal, filth or noisome*

substance to be collected or to remain in any place, to the prejudice of others, the obstructing or impeding, without legal authority, the passage of any navigable river, harbor or collection of water, or the corruption, or rendering unwholesome or impure the water of any river, stream or pond, * * * are nuisances."(1)—*Code of 1873.*

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(1) That boards of health may act understandingly in the removal of nuisances which are injuries to the public health, it is essential that they should have a clearly defined idea of what nuisances are, which they may remove or cause to be removed. A nuisance is said to be anything wrongfully done, or permitted, which injures or annoys another in the enjoyment of his legal rights.—Cooley on Torts, page 565; *Rex v. Watts*, 2 C. & P. 486, slaughter-house; *Rankett's Case*, 2 Rolle's Abr., 140, 141, melting stinking tallow; *Catlin v. Valentine*, 9 Paige's Ch. (N. Y.) 576, slaughter-houses; *Pickard v. Collins*, 23 Barb.. (N. Y. S. C.) 444, barn; Wood on Nuisances, Sec. 494.

Anything, then, which injures or annoys the public in the enjoyment of life or health is a nuisance, which it is the duty of boards of health, as the guardians of the public health, to abate.

The erecting, containing, or using any building or other place, for the exercise of any trade, employment or manufacture, which by occasioning noxious exhalations, offensive smells, or other annoyances, becomes injurious to the public health, comfort or property of individuals, or the public, *the causing or suffering any offal, filth or noisome substance to be collected or to remain in any place, to the prejudice of others*, the obstructing or impeding without legal authority, the passage of any navigable river, harbor, or collection of water, or the corruption, or rendering unwholesome, or impure, the water of any river, stream or pond; * * * are nuisances.—*Code of 1873, sec. 4089.*

Where an indictment charged that the defendant "unlawfully and injuriously did erect, continue and use a certain enclosure, or pen, in which cattle and hogs were confined, fed and watered, and the excrement, decayed food, slops and other filth were retained," whereby were occasioned "noxious exhalations and offensive smells, greatly corrupting and infesting the air; and other annoyances dangerous to the public health, comfort and property of the good people residing in that immediate neighborhood," it was *held*, that the acts charged constituted a public indictable nuisance, both under this section (4089) of the statute, and at the common law.—*The State v. Kaster*, 35 Iowa Supreme Court Reports, 221.

Any use of property, or any trade, that corrupts the atmosphere with smoke, noxious vapors, noisome smells, dust, or other substances or gases producing injury to property or to health, or impairing the comfortable enjoyment of property, is a nuisance. —*Wood on Nuisance*, p. 574, sec. 531.

Where defendant erected stock yards so near plaintiff's dwelling, and so kept them that the odors therefrom were not only an annoyance, but were unwholesome, threatening the health of plaintiff and his family, *held*, that the defendant could not escape liability on the ground that the yards were necessary to the operations of the road, and that the odors could not be avoided.—*Shively vs. Cedar Rapids, I. F. & N. W. R. R. Co.*, 74 Iowa, 170.

Any classification of nuisances will be necessarily imperfect; yet, for the purposes of this subject, it may be said that the public health nuisances are of two kinds:

1. Those which are *per se*, or which are such from their very nature, and which cannot exist in the vicinity of habitations without causing offense to the senses and injury to the health; such, for instance, as the exposed and decaying carcasses of dead animals, or accumulations of offal, garbage and slops, or fœcal matter in exposed places.

2. Those which are *prima facie*, or which become nuisances by reason of the misuse or negligent care exercised of an otherwise harmless and perfectly lawful object, business, or occupation; as, for instance, slaughter-houses, rendering-establishments, mill-ponds, or burying-grounds.

The methods of procedure to be adopted for the removal of any unhealthy nuisance will vary according as the nuisance to be abated comes within one or the other of these classifications.

If a board of health finds any decomposing or offensive matter upon private property, which, in their opinion, is injurious to health, they must first order the owner or occupant to remove it within twenty-four hours. If he neglects to do so, they may proceed summarily to cause such nuisance to be removed. If the danger to public health is imminent, and safety requires immediate suppression or abatement of the nuisance, the board of health would be protected if they proceeded at once to suppress it, for the safety of the people is the highest law.—*Meeker v. Rensselaer*, 14 Wend., 397.

If any unhealthy nuisance is found in a public place, it is the duty of the board of health to cause its immediate removal. If a pond, a slaughter-house, or a burial-ground, or anything of a kindred nature, becomes offensive and unhealthy to the community it is the duty of the board of health to proceed at once to abate the same. In the case of *City of Salem v. Eastern Railroad Company*, the Supreme Court of Massachusetts (98, p. 443,) under a statute which is a verbatim copy of the Iowa statute, held that the adjudication of the board that a nuisance exists is conclusive, and no appeal lies therefrom. The board should keep an accurate record of their proceedings, and all adjudications should appear therein in clear and distinct language. It is not the purpose of the order to direct in what mode the person should proceed to remove the

TO PROTECT FISH.

[Chapter 34, Laws of 1890.]

AN ACT for the Protection and Preservation of Fish and Repealing Sections 1, 2, 3, 4, 6, 7, 8, 9, 10 and 11 of Chapter 50 Acts of the Fifteenth General Assembly, Chapter 70 Acts of the Sixteenth General Assembly, Sections 3, 5, 6, 7 and 8 of Chapter 80, Acts of the Seventeenth General Assembly, Chapter 92, Acts of the Eighteenth General Assembly, and Chapter 9, Acts of the Twentieth General Assembly.

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

SECTION 1. That sections 1, 2, 3, 4, 6, 7, 8, 9, 10 and 11 of Chapter 50 of the Acts of the Fifteenth General Assembly, Chapter 70, Acts of the Sixteenth

nuisance. It should direct the end to be accomplished, leaving the party to adopt any effectual mode he may choose. If the owner or occupant neglects to remove the nuisance the board are at liberty to enter upon private property where it exists and take such measures as they may see fit for its removal.

The court further says, in relation to boards of health: "Their action is intended to be prompt and summary. They are clothed with extraordinary powers for the protection of the community from noxious influences affecting life and health, and it is important that their proceedings should be embarrassed and delayed as little as possible by the necessary observance of formalities. Although notice and opportunity to be heard upon matters affecting private interests ought always to be given when practicable, yet the nature and object of those proceedings are such that it is deemed to be most for the general good that notice should not be essential to the right of the board to act for the public safety. Delay for the purpose of giving notice, involving either of public delay for such hearings as the parties may think necessary for the protection of their interests, might defeat all beneficial results from an attempt to exercise the powers conferred upon boards of health. The necessity of the case, and the importance of the public interests at stake, justify the omission of notice to the individual."

"Notice must be given of general regulations prescribed by the board before parties can be held in default for a disregard of their requirements. No previous notice to parties so to be affected by them is necessary. They belong to that class of police regulations to which all individual rights of property are held subject, whether established directly by enactments of the legislature, or by its authority through boards of local administration."

Whether a business or thing, not in itself a nuisance, is so managed or suffered to exist as to be a nuisance, is a fact which must be determined by the board, upon investigation made by them. Although slaughter-houses are regarded by the courts as *prima facie* nuisances, a person engaged in carrying on the business of slaughtering animals cannot be compelled to discontinue that business upon the judgment of any tribunal except that of a court of competent jurisdiction. In this way alone can a board of health *legally* determine whether such a business is a nuisance so as to authorize them to abate it. But any collection of offal or filth in or about the slaughter-house may be removed by the board of health, and the place may be required to be kept clean under the authority conferred by sections 17 and 18, chapter 151, Laws of 1880, but the suppression of the business itself can only follow a judicial determination that it is conducted so as to be injurious to the public health. "A slaughter-house in a city or public place, or near a highway, or where numerous persons reside, is *prima facie* a nuisance." *Bushnell v. Robeson & Co.*, 62 Iowa, 540.

As to whether or not animals affected with a contagious disease may be summarily destroyed, the general rule seems to be that so long as the owner restrains the animal upon his own premises, no person has a right to kill them (except as provided by regulations of the State veterinary surgeon under the provisions of chapter 189, Laws of 1884); but if they are suffered to go at large, or if they escape from the owner's custody, the owner of the premises upon which they escape may kill them if necessary for the protection of his own animals. In the case of a horse or other animal affected with glanders, which is recognized by the courts as an incurable disease, and one which may communicate all its loathsomeness and fatality to human beings, there is no question but what a board of health would be protected in destroying them wherever found, after due notice given to the owner, if in their opinion it was necessary for the public health.—*See section 1481, Code of 1873.*

From the foregoing it will be seen, boards of health are armed with power to suppress unhealthy nuisances, which they should be prompt to exercise in all cases where the public health is, or will be jeopardized.

The success of boards of health depends very much upon the firmness with which they enforce needful sanitary regulations. See Hanover's Law of Horses, page 76

General Assembly, sections 3, 5, 6, 7 and 8 of Chapter 80, Acts of the Seventeenth General Assembly, Chapter 92 Acts of the Eighteenth General Assembly, and Chapter 9, Acts of the Twentieth General Assembly, be and the same are hereby repealed and the following enacted in lieu thereof.

SEC. 2. It shall be unlawful for any person to take from any of the waters of the State any fish in any manner except by hook and line; except that it shall be lawful for any person to take minnows for bait with a seine that does not exceed five yards in length. Also that it shall be lawful to take buffalo and suckers by spearing between the first day of November and the first day of March following. The word minnows, as used herein, does not include or apply to young bass, pike, croppies, salmon, or fry of any game fish, either native or foreign; and all such fish, either young or adult, so taken, shall be immediately returned to the waters from whence taken. It shall be lawful for the State fish commissioner to take from any of the public waters in any manner any fish for the purpose of propagation or restocking other waters.

SEC. 3. It shall be unlawful for any person to catch or take from any of the waters of the State, any salmon or trout, between the first day of November and the first day of April following, or any bass, pike, croppies or any other game fish between the first day of November and the fifteenth day of May following, in each year, in any manner whatsoever.

SEC. 4. It shall be unlawful for any person, company or corporation to buy, sell or offer for sale, or have in his or their possession for sale or transportation, any fish which shall have been taken in violation of sections 2 and 3 of this act.

SEC. 5. Any person found guilty of a violation of the preceding sections of this act shall, upon conviction before any justice of the peace, mayor of any incorporated town or city or any court of record within the county in which such offense is committed, be fined not less than ten nor more than fifty dollars and stand committed until such fine and costs are paid.

SEC. 6. No person shall place, erect or cause to be placed or erected, in or across any of the rivers, creeks, lakes or ponds, or any outlets or inlets thereto any trawl line, seine, net, weir, trap, dam or other obstruction in such manner as to hinder or obstruct the free passage of fish up, down or through such water course for the purpose of taking or catching fish, unless the same be done under the supervision of the fish commissioner, except minnows as provided in section 2 of this act.

SEC. 7. No person shall place in any of the waters of the State any lime, ashes, drug, or medicated bait, or shoot any gun or use any dynamite, gun cotton, giant powder or other explosive or any electrical machine or device with the intent thereby to kill, injure, poison, stupify or catch fish.

SEC. 8. Any person found guilty of a violation of sections 6 or 7 of this act shall, upon conviction before any justice of the peace, mayor of any incorporated town or city, or any court of record in the county in which such offense is committed, be fined not less than twenty-five dollars nor more than one hundred dollars, and stand committed until such fine is paid. And any seine, net, trap or other device used in violation of sections 6 or 7 of this

act may be seized and destroyed by order of the court before whom such action may be brought.

SEC. 9. In all prosecutions under sections 2, 3, 4, 5 and 13 of this act the person filing the information shall be entitled to a fee of five dollars, which shall be taxed as costs against the person, company or corporation so convicted, and in all prosecutions under sections 6, 7 and 8 of this act the persons filing the information shall be entitled to a fee of ten dollars, which shall be taxed as costs, as above provided, but in no case shall the fee of the informant be paid out of the county treasury. Any fish found in the possession of any person, company or corporation taken in violation of the preceding sections shall be seized and sold for the purpose of paying the costs in the case.

SEC. 10. Persons raising or propagating fish on their own premises or owning premises on which there are waters having no natural outlet or inlet through which such waters may become stocked or replenished with fish from public waters, shall absolutely own such fish as they may contain, and any person taking or attempting to take any fish therefrom, without the consent of the owner or his agent, shall be deemed guilty of a misdemeanor, and, upon conviction thereof, shall be fined not less than five dollars nor more than twenty-five dollars, or imprisoned in the county jail not more than thirty days, and shall be liable to the owner of the fish in damages, in double the amount of damages sustained, the same to be recovered in civil action before any court having jurisdiction over the same.

SEC. 11. Nothing herein contained shall be held to apply to fishing in the Mississippi, the Missouri or the Big Sioux rivers, nor so much of the Des Moines river as forms the boundary between the States of Missouri and Iowa.

SEC. 12. It shall be the duty of the fish commissioner to see that the provisions of this act are enforced, and, for that purpose, he shall have the right to call to his assistance any prosecuting attorney to prosecute all violations of this act in the county where such violations occur.

When requested by the fish commissioner, the attorney-general shall give his opinion in writing upon all questions of law pertaining to his office. Nothing in this act shall be construed as prohibiting any citizen from instituting legal proceedings for the enforcement of any provisions hereof.

SEC. 13. It shall be unlawful for any person to fish for or catch in any manner any fish in any stream in this State which has been stocked with breeding trout—one or two years old—by this State or the United States fish commission for one year from date of said stocking, provided notice of said stocking is posted by authority of the State fish commissioner whenever a public highway crosses such stream.

Any violation of this section shall be subject to the penalties prescribed in section 5 of this act.

SEC. 14. All acts or part of acts, inconsistent or in conflict herewith are hereby repealed.

SEC. 15. This act being deemed of immediate importance shall be in force and take effect from and after its publication in the "Iowa State Register" and "Des Moines Leader," newspapers published in Des Moines, Iowa.

Approved April 1, 1890.

SALE OF INTOXICATING LIQUORS.

[Chapter 35, Laws of 1890.]

SECTION 2. That after this act takes effect no person shall manufacture for sale, sell, keep for sale, give away, exchange, barter or dispense any intoxicating liquor, for any purpose whatever, otherwise than is provided in this act. Persons holding permits, as herein provided, shall be authorized to sell and dispense intoxicating liquors for pharmaceutical and medical purposes, and alcohol for specified chemical mechanical purposes, and wine for sacramental purposes, and to sell to registered pharmacists and manufacturers of proprietory medicines, for use in compounding medicines, and to permit-holders for use and resale by them, for the purposes authorized by this act, but for no other purposes whatever; and all permits must be procured, as hereinafter provided, from the district court of the proper county at any term thereof after this act takes effect, and a permit to buy and sell intoxicating liquors, when so procured, shall continue in force until revoked according to law. *Provided*, further, that this section shall not be construed to prevent licensed physicians from dispensing in good faith such liquors as medicine to patients actually sick and under their treatment at the time of such dispensing.

The remaining sections provide the machinery for the enforcement of the law.

FINANCIAL STATEMENT.

RECEIPTS.

Warrants on State Treasurer June 30, 1889, to June 30, 1890	$ 4,812.36	
Warrants on State Treasurer June 30, 1890, to June 30, 1891	4,921.32	
		$ 9,733.68

EXPENDITURES.

Secretary's salary June 30, 1889, to June 30, 1891	$ 1,200.00	
Expenses board meetings June 30, 1889, to June 30, 1890	292.25	
Contingent expenses June 30, 1889, to June 30, 1890	3,320.11	
	4,812.36	
Secretary's salary June 30, 1890, to June 30, 1891	1,200.00	
Expenses board meetings June 30, 1890, to June 30, 1891	330.60	
Contingent expenses June 30, 1890, to June 30, 1891	3,390.73	
	4,921.32	
		$ 9,733.68

APPENDIX.

Appendix—Iowa's Duty to the Insane.

IOWA'S DUTY TO THE INSANE.

BY H. A. GILMAN, M. D., SUPERINTENDENT HOSPITAL FOR THE INSANE, MT. PLEASANT, IOWA.*

I am happy to be called upon to present the claims of the unfortunate class, with whom my life work has been cast for a period of twenty-five years. A brief resume of what has already been done for the care of this class by our State may not be out of place at this time.

In 1854, the fifth general assembly of this State made an appropriation for the construction of a hospital for the insane, and the location selected was Mt. Pleasant. For a period of nearly seven years that institution was undergoing the process of construction and was not formally opened for the reception of patients until March, 1861. At least one political campaign was fought over this enterprise, and the stump resounded with the statement that a huge building, nearly one mile in area, and capable of accommodating all of the insane of the State for the next fifty years, was being constructed, and it was dubbed "Grimes' folly." The work was, however, continued, and the people builded better than they knew, as the rapid increase of those requiring such care and accommodation demonstrated.

In March, 1861, the institution was formally and appropriately opened, under the superintendency of the devoted and able Dr. Patterson, who still survives, having devoted his entire life to the cause of humanity in this and other States, to be followed by the lamented and consecrated Dr. Ranney, who fell a martyr to the cause, literally yielding up his life in his devotion. It was only intended to accommodate three hundred and fifty patients in this hospital, but four hundred were crowded in, and the demand was for

*Read before the annual meeting of the Iowa State Medical Society, and by unanimous resolution referred to the State Board of Health for publication in the Sixth Biennial Report of the Board.

more room; and in 1868, I think it was, the legislature made the first appropriation for the hospital at Independence, which was to accommodate a like number, and when opened was placed in charge of Dr. Reynolds, who most faithfully labored in placing the new plant in line with the best institutions of the country, ably seconded by our friend, Dr. Hill, who succeeded him. Thus up to eight years ago the actual capacity for the care and treatment of the insane, provided by the State, was about eight hundred. The terribly crowded condition of the two hospitals at that time, and the pressure of other cases, constantly demanding treatment, called loudly for still further room, and as a result appropriations were made by the twentieth and twenty-first general assemblies for additions to both the hospitals, and for a third institution, which was located at Clarinda. By this action, the capacity of the two older hospitals has been doubled, and provision already made at Clarinda for three hundred, so that in the past eight years, the increased accommodation provided has been from eight hundred to nearly two thousand. But still the cry goes forth from the almshouses of the State, and from the families struggling to care for their loved ones in their own homes, for more room, while the hospitals are all crowded, and the boards of trustees are compelled to order many cases discharged and returned to the counties from whence they came.

The demands of humanity and the economy of the hour alike call for prompt action in still further providing for these afflicted ones, who can not speak for themselves, and who, in members of this society and kindred associations, must find champions. While tardy in commencing and carrying forward the work of providing accommodation and care, yet the retrospect of the last eight years, affords much satisfaction to the participants in the service, and reflects much credit upon the great heart of our commonwealth. If the same policy, with the additional wisdom which experience brings, can be pursued for a like period in the future, the problem of proper care for all of the insane of Iowa will have been solved, and all will enjoy that comfort, treatment, and so far as possible, immunity from suffering, which their misfortune entitles them to. To accomplish this, however, requires an amount of presistent effort which no one can realize who has not been actively engaged in the effort, and the combined forces of this society should be

focalized upon the next general assembly that no delay be permitted in meeting the demands of the hour in this direction.

The hospitals at Independence and Mt. Pleasant are now practically completed, except as it may be desirable to have attached infirmary wards for the sick and feeble, or to be used in case of contagious diseases. Sufficient appropriations should be made by the next general assembly to complete the hospital at Clarinda, thereby accomodating at least 400 more, and it seems almost criminal that there should be further delay in establishing a hospital in northwestern Iowa, and pushing it to completion as rapidly as the work can be economically carried forward. No reason seems obvious why this provision should not be promptly made. The howl of the demagogue for personal political aggrandizement of party purposes, as has sometimes been the case in the past by narrow-minded and no-hearted men of all parties, should meet with the rebuke deserved, and the broad philanthropy and intelligent progress of this State should rally to the demands of the hour.

A section of land should be secured, and the opportunity afforded for all of its patients capable, to be employed in its early history in cultivating the soil or in aiding in the construction of the buildings, and in grading the grounds, as accommodation may be made for them from time to time. There is nothing more detrimental to the interests of any class than idleness, and we owe it to the large class of insane, not suffering acute brain disease, to take advanced steps in making arrangements for diversified industries, in connection with all of our hospitals. In a small way we have always done more or less in this direction, but by proper and well organized effort, and the facilities in the way of shops and tools, a great deal more may be accomplished, which will not only be useful in our domestic economy, but in relieving to a great extent the restlessness resulting from the monotony of non-employment. The advanced steps taken by other States, in making proper provision for all their insane, should act as a stimulus to Iowa. New York is not only making the necessary provision, but has, by its legislature, enacted a law prohibiting the placing of the insane in county almshouses. Vermont has practically done the same thing, and even Minnesota, on the north of us, younger and less wealthy, with its three hospitals, is providing for every insane person in the State. The comparatively new State of Nebraska has three institutions for the care

of the insane, and Dakota two. Missouri has practically four and Illinois five, and is moving toward the construction of an additional one. California, on the Pacific, is providing for all of its insane. Thus we are surrounded by States making provision for all, or a much larger per cent than Iowa is doing, and with one hand stretched out to the Atlantic, and the other to the Pacific, the great heart of the Nation is rapidly enfolding within its comfortable retreats these unfortunate of God's children. No more patriotic or economic question at present occupies the attention of our people, right here in Iowa, and he who accomplishes most in pushing forward to an early consummation the needed accommodation and care of the insane of the State, will call forth the warmest encomiums of a grateful commonwealth.

While the homes for these people are being provided, a constant, persistent effort must be made to increase the efficiency of the working force of each hospital. It is frequently the case that we are compelled to employ as nurses and attendants young men and women from the country or town with no experience whatever. They may learn aptly and become valued employés; many, however, will not, and the weeding out process must continually go on. The training school in many institutions is doing much to educate proper attendants; but I feel that in connection with the medical department of the State University, there should be constructed a hospital and training school for nurses and attendants, who could have the advantages of lectures on anatomy, physiology and pharmacy, and practicable demonstration of the care of the sick at the bedside; and at the same time have the advantage of lectures, by the chair on mental diseases, adapted to persons seeking to enter the profession of nurses or attendants. By such a course of instruction we can have such material to draw from for attendants in our hospitals as will warrant the best possible efficiency, and guarantee that skilled and conscientious care which the superintendent of every hospital is constantly seeking for in each case placed in his charge.

The chapel exercises, the varied programs for amusements, the athletic exercises, the industrial departments, together with such wise medicament as will aid nature in the restoration of both mental and physical health, covers in general our course of treatment.

All individuals thus saved to themselves, their families and the community, not only escape the torture of chronic insanity with its delusions confirmed for life, sometimes of a most distressing character, and most likely a lifetime expense to the county or State, but they become producers of wealth, useful citizens, and supporters of the family. Are not these two sides of the question sufficient to arouse the students of political economy on the one hand, and the philanthropists on the other? To you, gentlemen of this society, in your several committees, the people look for guidance in these matters, and for the formation of public opinion you are largely responsible. Is it too much to expect that your influence will be felt in the right direction? Whether by the side of the death-bed of the mother's darling, or when in the throes of agony, a republic was in danger, you have not been found wanting. I believe your sympathy and substantial support extends to, and will in all the future aid in maintaining by your voices and efforts, the sacred duty we owe to those for whom "the light of reason has gone out." and who thus beclouded can not appeal in their own behalf.

DISPOSAL OF SEWAGE.

EDITOR OF BULLETIN (1):—I have lately been reading a number of articles in various sanitary works and journals on sewers and sewage.

The authors of these pose as sanitary engineers (?).

Their whole system is this: Given: A river or harbor: what grade must be established to run the sewage of a city into the water and so pollute it as much as possible for ten or twenty miles around?

Here is a city extending back from the waters of river or harbor for seven, eight or more miles; what grade is needful to dump the filth of the suburbs down on that part of the city, bordering on the water side?

(1) From the MONTHLY BULLETIN of the State Board of Health for March, 1891.

How many holes shall there be in the sewer, to permit the smell and gases to fill the atmosphere, and permeate the residences of the solidly built parts of the city?

That, in a nutshell, is what nine-tenths of these works and articles amount to.

And to do that class of work does not require a man of national reputation. An engineer capable of running a level and deciding on a gradient is fully competent to build such a filth conveyor.

The idea is all wrong that the filth of five miles, or a greater distance, should be run through the entire city, exposing the inhabitants of that part of the city nearest the terminus of the sewer to the contamination of the sewage of some one living half a dozen miles away.

Suppose the sewers all lead to the river or harbor, and the part of the city nearest the initial points of the sewers is attacked with typhoid fever. Would it be right, or is it right, to run all the excreta from the thinly settled part of the city so affected, down through the thickly built and inhabited portion, and float the typhoid germs out along the entire water front?

It seems to me as if each portion of the city has enough to do to keep itself in sanitary condition, without having to guard against the evils that another portion pours down on it.

Until an engineer arises capable of devising ways and means to district a city and have each district secure its own sanitation, without danger from another district, the present race of so-called sanitary engineers would do well to take in their signs, and call themselves just simply what they are, surveyors and civil engineers.

JAMES L. LORING, C. E.

To the Honorable State Board of Health of Iowa: (2)

Having been requested to furnish a paper on SEWERAGE, the following remarks are suggested as the result of an endeavor to read as much as time would permit, the results of the experience of others.

In a former paper published in the BULLETIN of this Board your engineer suggested that the day must come when district sewerage must take the place of the sewerage of large areas, and he is glad

(2) Presented to the State Board of Health by James L. Loring, C. E. of the State Board, and ordered printed.

to notice that such influential journals as the *Sanitary News*, of Chicago, have in several later numbers advanced the same views.

How best to accomplish this end is as yet a question, but discussion has commenced, and from a multitude of counsellors perhaps the wisdom of methods may be evolved.

Doubtless many ways will be devised, but science eventually triumphs, and even as this powerful agency has harnessed the lightning for man's daily use, so the same untiring research will arrange for his sanitary well being.

The sewerage system of nearly all the cities and towns of the United States is in its swaddling cloths.

Given:—A city or town set upon a hill at the foot of which runs a stream of water; establish a gradient and thereon build a brick-ringed tunnel, or lay an iron pipe, thus forming a channel through which to discharge as rapidly as possible, water, which will run down hill if left to itself, and which shall be the carrying agent for the hourly accumulating filth of ten square miles of humanity. Is that sanitary engineering? It seems as if the veriest tyro at the eye-piece of an engineer's level could establish the grade, and a fairly skillful brick-layer build the tunnel.

But that is not all. Into the stream pours all the sewage, under the delusion that the water will purify everything it touches. Will it kill germs and bacteria? Have not the scientists who make these matters a study, demonstrated that the chill or cold does not destroy, but that only a certain heightened temperature can obliterate those organisms which propagate disease?

Let the case be taken of a city situated as is Des Moines, already grown to sixty thousand population, the greater part of whose waste goes into the rivers that bound two of its borders. One hundred and sixty miles from the Mississippi river this sewage is added to all that may flow down all along the current from far up in Minnesota, increased by all that the numerous towns and slaughter-houses below may choose to add, growing greater in volume every day. Will such a state of affairs be permitted to exist continuously? It is not to be believed; there must come a stopping place.

This last year, and for four or five years past, but little rain has fallen. The river, that used so frequently to exceed its banks, has fallen so low that grass has grown, and cattle have browsed, in the

middle of its bed. Where were the flushing waters to carry away the constantly inpouring sewage?

The Columbus *Dispatch*, as copied in the issue of Oct. 10, *Sanitary News*, says:

"The river just now is a menace to the health of the city, and just what to do is what the health officer does not know. The water is of inky blackness, and from it ascends a most sickening odor, that fills the air for squares away. The health officer fears an epidemic of fever may follow."

And much more follows on the dangerous aspect of the case.

When an engineer in Ohio, I well remember the clear Scioto, just as thirty-six years ago I first saw the Des Moines, carrying the tribute of its pure water to its outlet at Alexandria. Yet the first is to-day "of inky blackness" and the second has lost its virgin purity, and may soon rival the first.

The *News* also in the same number adds to its warnings the voice of the Philadelphia *Record*:

"Concurrently with low water in the streams which furnish the supply in many cities of the country, there has been an increase in the number of typhoid fever cases. By so much as the volume of running water is at any time diminished, the proportionate pollution is increased. It is fair to infer, from more pollution more fever; and it is reasonable to insist that the way to prevent disease is to stop the cause of it.

"It is not an impracticable thing to take care of the sewage with which our streams are poisoned.

"The city of Berlin, with a third more inhabitants than Philadelphia, manages to dispose of its sewage by a system of irrigation which measurably repays the city for the expense incurred.

"It is also possible to adopt the system of chemical precipitation, which renders the sewage innocuous by admixing it with lime, copperas, sulphate of alumina, salts of iron or other disinfecting and deodorizing substances.

"The city of London takes care of a large part of its sewage by means of chemical precipitation."

The drainage of London cost thirty millions, and is the result of years of trial and experiment. Such an enormous sum is of course exceptional, and only possible in a city of five million people. Yet cities everywhere may reap a benefit from the expenditure of this money. From the attained results of London sewerage may be found ways adapted to smaller communities, and those having the benefit of a knowledge of the various systems there in use, may, at proportionately less expense, adopt the one properly adequate.

But from everywhere comes the warning: "Do not pollute your streams."

How can this effect be attained? Must it be a work of the chemist applied to individual residences? Must it be the work of the same agent extended to a certain district? Must it be by the method of farm irrigation? Must it be by that agent which gives to the English-speaking world the word, "Purification," which the Greeks named "Puros" "Fire"?

To give a dictum as to methods is not the purpose of this paper.

To flow sewage down hill into a river seems easy. The expense is less, especially if the hills are steep along the banks. The system seems to be engrafted into all communities, and looked on as an easy, ready solution of a vexing question.

Town councils are not selected for sanitary abilities, and their constituents are apt to grumble at expenses incurred for matters beyond their experience or study.

Improvement comes slowly but surely.

A few men, enthusiastic in the direction of sanitary thought, anxious and still growing more eager to solve the problem for their fellows, without pay or means to prosecute research, can only warn against existing evils, draw attention to needed reforms, and hope for the millenial dawn.

The under-lake conduit furnishing Chicago with water, would have remained only a dream in the brain cells of the engineer if money had not been forthcoming to test its validity. So must be the question of methods of sewage disposal outside of utilizing the water courses.

Somehow or way money alone can decide.

The age is prolific of thought and ideas, the only difficulty being to give them materialization.

Can a city be persuaded to turn a certain district over to the chemist, another to another agent, and these working from some acknowledged success in some city like London, bring the results to some satisfactory conclusion?

Time is required for this, but time is money, and brains are born.

One thing always stands in the way of progress ,and that is, the inability of mankind in general to look ahead.

That which is around the average man to-day bounds his prospects. He is apt to be a pessimist, and look as through a glass,

darkly. He sees one hundred men and can not comprehend that shortly a thousand may occupy the same ground. He grumblingly acceds to the needful taxation that will aid the one hundred; he cares nothing for the thousands of next year.

Yet this is the complexion to which we must come at last.

The wants and demands of the future must be met.

We are only here as temporary keepers and custodians of the land. We owe to our descendents uncontrovertable duties, and not the least of these are the ways and means to perfect health.

We have no earthly nor moral right to poison the waters that should flow untramelled and clear as the skies they reflect, but men apt and skillful should be designated and paid to experiment, to devise, to accomplish.

The dwellers on the streams of Iowa should see them flow by their doors as they did when the Sacs and Foxes paddled their canoes over their limpid waters. They should be able to drink, or allow their cattle to drink, without asking if typhoid fever, diphtheria, or all the ills man is heir to, are in the draught.

Money can do this work and that alone; even this Board cannot create a state of health by a formula of rules. The State should make it a Bureau, and, outside of all politics, scientific men should form its *personnel*. These should be authorized to examine and investigate, and their decisions have the dicta of law, and to back them, money.

"What constitutes a State"? The men and women in its borders, and surely neither "High raised battlement" nor lofty tower can guard those over whom the Goddess Hygeia does not preside.

The question of sewage disposal is beyond compare worthy of elucidation. It *must* be answered, and that in a short time.

The able physicians who constitute this board are selected from various portions of the State of Iowa, and in their practice many problems must appear solvable only by a research into the causes of disease referable to improper sewerage.

Each should semi-annually report on such cases, and give their deductions.

From all these may come solution and authoritative remedy.

It is only thus that communities can be aroused.

I cannot resist adding a plea for the members of the profession from whose pains-taking efforts must come, in a great degree, the

final solution of the whole question of sewage disposal. This profession is civil engineering.

But how few the opportunities the members of this profession have! I have known many of my brother engineers, skillful, intelligent, quick to see and comprehend; taking pride in the possibilities of the work; absorbed in problems of overcoming difficulties; willing and anxious to do; yet abandoning their loved work, in utter weariness, for some other business.

All of them are students; their minds trained to mathematical demonstrations; and yet hampered by an atmosphere of politics they do not wish to inhale. Not one of them but would rejoice to see his office freed from the demands of a political party.

Beginning with the county surveyor, elected, not for his engineering qualifications, but for his political bias. He is unsalaried, and even a corner room in a court house is begrudged him.

I have often felt sorry for him when I have heard a proposed ticket read ending with the invariable wording: "For surveyor *and* coroner." Both are kindly elected together, to earn their money at a rate fixed unalterably by the legislature, utterly regardless of whether one day's labor may not be worth three of another's.

The sport of politics, bound to contribute to party exigencies, he goes into commission without knowing whence shall come his employment. He sees a committee of two farmers set to superintend the building of roads and iron bridges, and totally ignored, he has no inducement to study, or to experiment and elevate his professional standard.

The same state of affairs exists in cities. A laborious, painstaking engineer must give way to party politics every year. So that many an engineer, who is a reader and thinker, sees no opportunity to put in practice his plans, and quits his profession in disgust.

Some amendment should be made to this state of affairs.

Of what use to train a young man at Ames, or Iowa City, in civil engineering, grant him a diploma and turn him loose to starve?

The State of Iowa affords facilities for the education of farmers, veterinary surgeons, etc., who may reasonably expect employment, within her borders, shortly after graduation.

Her classes of civil engineers, if they desire employment, must follow the lines of railroads to the Rocky Mountains and the

Sierra Nevada, and thus the State is deprived of the services of an intelligent body of young men whose talents she has developed and trained.

If at any time an engineer is needed, for home work, he is brought from Chicago or New York.

The chairman of a certain board of supervisors, in an Iowa county, wrote to me that an iron bridge, built by an eastern company, did not, in the unanimous opinion of the board, meet their requirements, and asked what an examination would cost. The answer was: "Twenty dollars to twenty-five dollars." No reply was made, but the committee, consisting of two farmers, who knew just as much about an iron bridge as they did of the differential calculus, recommended payment for the bridge, without examination, rather than pay that fee to satisfy their own reasonable doubt.

This state of affairs should not be existent.

Not a phase of our statute law gives standing to a civil engineer, while all other professions are guarded and recognized.

There are ninety-nine counties in Iowa, and in each should be one or more civil engineers, paid, salaried officials, and with instruments and office furnished, he should be held responsible for every engineering work in the county.

The law declares who may practice medicine or law. It throws the ægis of its authority over the druggist who supplies only remedies after disease has made its attack. Why should it not say who shall initiate those preventive measures that shall keep disease at arms' length? Why should it not recognize the profession of a civil engineer, who shall also have knowledge of sanitation?

How quickly would every engineer in Iowa respond to all demands on his talents and his skill. How great would be his interest in the needful reforms, and the result would be a ready solution of the sanitary well-being of every city, town and township of Iowa.

DISPOSAL OF HOUSEHOLD WASTE.

BY FREDERICK BECKER, M. D.(1).

To the State Board of Health:

I desire to call the attention of the board to the sanitary condition of most of the small towns, and isolated homes, of the State, which suggests that something be done by this board to remedy these existing evils.

It would seem uncalled for to appeal to this board, were it not for the fact that when epidemic, or contagious diseases, invade small towns, and even isolated country homes, the death rate is usually a large one. Larger towns and cities are, as a rule, provided with modern sanitary improvements, such as sewer systems and water works, which provide for the disposal of sewage, and for the furnishing of an abundant supply of pure water, doing away with the necessity of using water from wells situated on small village lots, where, on a small space of ground, are placed the dwelling, barn, privy and often other necessary and unnecessary buildings, together with the well and cistern, for the family water supply.

Aside from that, every family, be it ever so small and economical, has a certain amount of offal, which, if not the greatest care is exercised in its disposal, accumulates, and in time forms a decomposing mass, filling air and soil with its effluvia, contaminating air and water supply.

This is not all. These little towns have their hotels, restaurants, stores, shops, livery stables, and other business enterprises, where offal of all kinds accumulates and fills streets and alleys.

Is it a wonder that under conditions of this kind, contagious diseases find a fertile soil?

(1.)—Of the Committee on Food and Water of the State Board.

Appendix—Disposal of Household Waste.

The question arises: What can the State Board of Health do to better the sanitary condition of our smaller towns and isolated country homes?

The only answer I know of, is: To better educate the people how to dispose of their offal and sewage.

I was very much interested in reading a pamphlet lately on this very important subject, written by Wm. Paul Gerhard, a sanitary engineer of New York City, and entitled "The Disposal of Sewage of Isolated Country Houses," which describes an effective method to dispose of sewage in a cheap manner.

I am of the opinion that the distribution of a sufficient number of these pamphlets to the health physicians of the different local boards would prove a nucleus out of which a plant might grow fruitful, of great benefit to the present and future generations.

Mr. Gerhard, in his book on "The Disposal of Household Waste,"—says: "Taken in its broadest sense, domestic refuse consists of *solid garbage*, of the liquid and semi-fluid wastes or *sewage*, and of *gaseous impurities*.

Solid garbage comprises three kinds of waste material, namely: (1) Animal and vegetable matter; (2) mineral matters; (3) miscellaneous coarse rubbish.

Organic refuse, or kitchen offal, is largely composed of those animal or vegetable parts of food which are removed in preparing it for eating, such as potato parings, husks of certain vegetables, cabbage leaves, fruit peelings, intestines of birds, etc., of portions of food left over after cooking, and food remnants removed from the table, such as meat and fish-bones, waste bits of birds, meat offal, kitchen grease, bones, fat, etc.

The mineral matters consist of the incombustible remains of fuel, such as coal and wood ashes, cinders, clinkers, house dirt, yard sweepings, small rubbish, and of miscellaneous dry refuse matter.

The coarser miscellaneous rubbish consists of a heterogeneous mixture of imaginable things, such as dust, floor sweepings, litter, mud, broken bottles, oyster cans, tin cans, worn-out kitchen utensils, preserve jars, medicine bottles, broken toys, old mattresses, straw, hay, old boots, baskets, pieces of matting, oil cloth, carpet, wall paper, leather, rubber, paper, pieces of cloth, bits of wearing

(1)—Reprinted by permission of the author, Wm. Paul Gerhard.

Appendix—Disposal of Household Waste.

apparel, hoop skirts, towels, napkins, shirts, sheets, stockings, rags, stones, clinkers, brick-bats, plaster, flower-pots, old crockery, broken glass, old iron, scrap tin, bones, hair, sticks, shavings, oyster and clam shells, etc.

House sewage consists of water fouled by use in the household, such as soapy and fatty slop-water, kitchen and laundry wastes, chamber slops, to which are often added solid excreta, urine, the flushing water used in the removal of liquid and solid excrements through a system of plumbing fixtures, etc., stable drainage and manufacturing wastes.

The gaseous impurities comprise air fouled by the process of respiration, by emanations and exudations from the skin and body, by perspiration, by the combustion of fuel, by noxious products incident to most forms of artificial illumination, by the processes of cooking and washing, by exhalations from soiled linen, cast-off clothing, etc., accumulations of decomposing matters of all kinds, and occasionally bad gases originating in the drains, waste-pipes, traps and plumbing fixtures of a house.

The removal of gaseous impurities is accomplished first, by removing all direct sources of bad air, and second, by ventilation; and since this may properly be considered a separate and distinct subject, although of equal importance in domestic sanitation, I shall not touch upon it.

Generally speaking, the solid refuse, the garbage and ashes are either properly disposed of on the premises adjoining habitations, or else they are removed by scavenging. Liquid refuse or slop-water is disposed of on the premises where sufficient space is available, or else it is removed by sewerage. Human excreta are sometimes disposed of on the premises by admixture with garden earth or ashes, or else removed in pails or tubs, all comprising the so-called dry methods of removal.

It is necessary, in order that no nuisance, and no danger to health may arise, to dispose of all waste matters in the most economical, least disagreeable, and safest manner possible.

Isolated Country Habitations.—Household refuse is always generated in the process of housekeeping; in fact it is an unavoidable incident of human life. The oftener and the more regularly the removal of this refuse is accomplished, the nearer do we succeed in maintaining in our homes that cleanliness which is one of the

first virtues of the householder. The contents of swill barrels are always more or less subject to rapid fermentation and decomposition, and soon become not only highly offensive, but dangerous to health, particularly during hot weather. Hence, in summer time a daily removal is especially important.

With small cottages, farm-houses, mechanics' and laborers' dwellings, the management of both garbage and sewage is not a difficult matter. Instances are extremely rare where there is not provided sufficient garden space to enable the farmer or laborer to return to the soil as manure the wastes from the household. It matters little whether the plot of ground attached to the house is arable or pasture land, a vegetable or fruit garden, each of these advantageously cultivated by their owner. Moreover, a good and thrifty housewife will soon learn the habit of saving the fat, lard, tallow or grease, either to sell it to the soap-maker, or use it on her own premises in making soap. Much of the meat refusal and other swill can be disposed of as food for household animals, such as dogs and cats. Some of the refuse is taken up with avidity by chickens; finally, one or more swine, kept in cleanly surroundings—for it is mistake to suppose that a pig is by nature not a clean animal—will dispose regularly of much of the remaining swill or kitchen refuse; other parts may, without difficulty, be dried and burned in the kitchen range. Coarser refuse, and many of the matters contained in the above enumeration may be picked out and kept in a dry condition, in an out-house, until some peddling junk-dealer arrives, who will always be glad to remove them.

It appears, therefore, that the garbage question is not at all a troublesome one, requiring only a little intelligence and common-sense management.

Excreta of domestic animals and various other refuse may be dug into the ground, and thus every source of a nuisance can be effectually removed. By a little considerate management of the range and fuel, securing a better combustion, the quantity of ashes and cinders can be kept down to a minimum, and if kept dry and absolutely free from admixture with organic refuse, ashes and cinders may be utilized to improve garden walks or country roads, or to fill up low spots.

The disposal of the liquid sewage in small isolated houses can be equally easily accomplished. Wherever a small garden, a lawn, a

grape-vine trellis, or an apple orchard adjoins the house, the sewage may be used with advantage to feed the plants and fruit trees, and to irrigate the soil. The ruling principle should be to keep solid and liquid waste matters as much apart as possible, as this will facilitate the disposal of both. The kitchen water, the soapsuds from washing, chamber slops, urine and other foul water, are easily disposed of by daily distribution in the garden, either by surface or sub-surface irrigation. Both methods are far preferable to the crude methods usually adopted of discharging into an open ditch, or into some neighboring water-course, brook or pond, or of retaining them on the premises by pouring on the surface of the ground in front of the kitchen window, keeping the soil continually moist, and saturating it quickly with putrefying filth, or by storing it in leaching or tight cess-pools, or pouring it into disused wells.

The slops may be collected every day in a tight vessel and carried to the garden and there used to water plants, shrubs or fruit trees.

Instead of surface irrigation the slop-water may be discharged into one or more lines of absorptive drains, consisting of common agricultural tiles, laid with open joints at a depth of eight to ten inches below the surface. For the smallest cottage fifty feet of tiles are sufficient, laid either in one or several lines, and the amount of tiles should be increased in proportion to the quantity of waste water from the house.

The principal point of importance is that the sewage be applied to the soil while fresh, and before it begins to decompose; that it should be applied in moderate quantities only, to prevent an oversaturation of the soil; that it should be applied on or near the surface, within reach of the oxidizing influence of the air; and finally, that the application be made intermittent, so as to give the soil after each discharge a chance to breathe, as it were, and to allow the solid finer portions to be oxidized and destroyed. An easy method of disposing of slop-water, where the house has no plumbing fixtures, is to have near the house a hopper, or receiver, made of wood, rustless iron, or better, earthenware, and provided with a strainer and proper cover. From this a pipe may be carried under ground to the absorption tiles. The sewage from the house may be

carried and discharged into this hopper, thus sending a considerable volume at one time into the tiles.

The solid excreta may be disposed of by an earth- or ash-closet, in place of the usual privy so universally condemned by all sanitarians.

In the dry earth system sufficient dried earth or garden loam, and sometimes coal ashes, are mixed with the excreta to absorb all foulness and keep down odor, and prevent putrefaction. An earth-closet, if out of doors, should not be too far away from the house; it should be protected by a substantial structure, well lighted and ventilated; plastered on the inside to prevent exposure in cold weather, and also the rays of the sun. A dry walk should lead to it from the house, screened from view and the winds. As a rule it is better to locate the earth-closet in an isolated, detached part of the building. The excreta should be received in a movable wooden box, well tarred, or in a galvanized iron pail, which must not be too large, and of such shape that it can be easily carried. All parts of the earth-closet should be above ground, and no vault or pit of any kind should be permitted. The receiving vessel should fit close up under the seat, and each time the closet is used, ashes or dry earth should be added as deodorizers. The property of dry earth, of not only deodorizing but of absorbing and rendering harmless the excreta of animals, has long been well known. A much smaller quantity of earth is required for earth-closets if solids and liquids are separated, which may be accomplished by intercepting the urine under the seat by a separate waste-pipe. The earth-closet is thereby more easily kept free from smell.

The dry earth manure ought to be removed at frequent intervals, and in the summer time used in the garden. In winter time it may be dried in an out-house, and then can be applied over and over again. Ashes are sometimes used in place of earth.

In houses of more pretentions, where the earth closets are located in an extension of the cottage, a more convenient method of disposal of the liquids may be had by a properly ventilated and trapped waste-pipe to carry the waste from the kitchen sink, laundry-tub and bath-tub into a small receiving tank located outside the house below the frost line. This tank may be of wood, iron, earthenware or brick. It may be emptied by hand, by a syphon or other

mechanical device. It may be useful to provide a greater trap to prevent the grease from being discharged and clogging the small absorption tiles. It is assumed that the topography of the lot is favorable to such a plan; that there is not a slope from the garden or absorption field toward the house, as then disposal by gravity becomes impossible.

Whether or not farm-houses and laborers' cottages should be provided at all with plumbing work is a question of convenience and comfort. The annoyance of frequent repairs, the difficulty in securing competent mechanics to make repairs, freezing in Winter, and sometimes lack of water for flushing purposes, deter many from putting plumbing into their homes in country districts.

Generally speaking, suburban and country residences, not in reach of sewers may dispose of the sewage by one of several methods, it being understood that the disposal of garbage is the same as for smaller houses, the difference being only one of degree.

1. The sewage may be discharged into an open surface ditch or gutter, removing everything from the house and carrying it into a distant sink hole, or to some low spot where the sewage will be allowed to soak away and evaporate slowly. This system has not a single feature of merit, and becomes highly offensive to the immediate vicinity of the house.

2. The house drain may empty the sewage into a large open, or leeching cess-pool, which allows the liquids to ooze away through underground, porous strata, or through fissures and cracks in rocks. This is a system to be utterly condemned. A leeching cess-pool is not only in itself an abominable nuisance, but it unavoidably pollutes the subsoil in the neighborhood of dwellings, contaminates the water supply, and renders obnoxious the air we breathe. Even if where it cannot work danger to our own house, our own well or spring, it may pollute a shallow or deep well of adjoining premises.

3. The drain may deliver the sewage from the house into a tightly-built cess-pool provided with an overflow pipe carried into some ditch or water course. This is a makeshift arrangement which cannot be indorsed.

4. The sewage may be emptied into an absolutely tight cess-pool, without any overflow. This is permissible under certain circumstances, but it may become an evil, for it involves long storage, and not immediate disposal, hence, though it avoids the pollution of

the water supply, and the contamination of the soil, its objections are many and serious, and it cannot be approved.

There may be cases where there is no other feasible way to dispose of sewage other than to run it into a tight cess-pool. In that case it should be as far away from the house as possible. There should be proper disconnection by traps between it and the house. It should be built in two compartments, one, the larger, to receive the solids, the other smaller, the liquids. Both should be built of moderate size, circular in shape, of hard burned brick, laid in hydraulic cement, and the walls rendered in Portland cement inside and out. Each chamber should be arched over, topped with a man-hole, and covered with an iron cover. It should be supplied with a good ventilator, and must be frequently emptied and cleaned. The liquids may be pumped out and spread upon the lawn, garden shrubs, and vines. The solids may be removed and dug as fertilizers under the soil. An overflow pipe should be provided that the liquids may flow into the proper chamber.

5. The sewage may be discharged into some stream, or water course, which is simply removing the evil from one place to another. The pollution of creeks, rivers and streams must be avoided.

6. The sewage may be disposed of on the premises, or on some adjoining land, either by application to the land, if the topography of the land is favorable, or by some mechanical process of filtering and straining.

Wherever suitable land is available, the application of the sewage to the soil forms the best method for the disposal of sewage. The land should not be near the house nor domestic water supplies, and depending not so much upon the surface as the inclination of the underground geological formation.

The soil of the field should be gravelly and porous. If tight clay or damp, it should be properly under-drained below the frost line. Common two-inch porous tile, one foot long, may be laid eight or ten inches below the surface on continuous boards, with a space at the joint of one-fourth inch, to facilitate oozing out of sewage. The joint should be covered with an earthen cap to protect from dirt falling therein. A fall of two or three inches per hundred feet is sufficient. The tile may be laid in parallel lines five feet apart.

They should connect with the main conduit by a Y branch. The main conduit should be laid two feet deep, and the two-inch branches be laid in cement until they reach the depth of eight or ten inches. The main drain or conduit should be four inches in diameter and connect with a flush tank with a fall of not over six inches per hundred feet, where it connects with the branches. The flush tank should be built of hard brick laid in hydraulic cement, and perfectly water tight, circular in form, and large enough to hold one day's volume of sewage. Between the house and flush tank should be placed an intercepting chamber, or grease trap, to catch all solids, paper and fatty matter from the kitchen. This chamber must be cleaned frequently.

The liquid wastes from the house are retained in the flush tank until it is filled, when by means of a gate-valve, the contents are delivered suddenly into the main conduit and thence into the irrigation tiles, and thus the whole absorption field is brought into use, instead of a constant dribbling, trickling stream. The purification begins at once. The clarified liquid soaks into the ground, the impurities being retained by the earth, and quickly destroyed. Air enters the pores of the soil and prepares it for future use, while the tank is again filling up. It is the layer of earth next the surface—the sub-surface, that acts on sewage. Aeration is the *sine qua non* of the whole system.

For a small country house the whole system should not exceed in cost $250; for a large country residence, $500.

As villages are but an aggregation of country houses, the filth products can be disposed of on the premises therein by the methods given for country houses.

In proportion as the dwellings become crowded together, the gardens attached reduced in size, and the population increased, the community as a whole must adopt proper measures for sewage disposal. To dispose of the slop-water nuisance a six-inch pipe will answer for a whole village of one thousand inhabitants, with branch pipes to each dwelling. From this sewer all surface and subsoil water should be rigidly excluded. The solid refuse may be removed by a system of public scavenging, and disposed of on outlying soil.

MONEY VALUE OF SANITATION.

BY L. F. ANDREWS.

In every department of social life the cost is counted, except that of sickness and death, and in no department is the cost so great as in these. Probably not one person in each thousand of the population of a community, or of the whole State even, ever stops in the rush of life to estimate the cost of sickness in a community, or what proportion of it may be saved, or to calculate the profit that may accrue from preventing it—a profit to be fixed in coin, as tangible as any stamped with the head of Liberty by the government. How much labor, time and money are lost in the State, or in any community annually through sickness of those who perform the labor! Vital statistics with their columns and pages of figures of population, number of deaths, number of deaths per thousand of the living, number of deaths under five and ten years, number of deaths from specified diseases, most of which are preventable, all represent expense, loss and misery. They also represent the health of a people. The mortuary table is the barometer of the sanitary condition of a people. That community is the most healthy which has the greatest number of individuals capable of doing the largest and best amount of the varied essential labor for the common good and with the least cessation.

What is the money loss caused by sickness and death among that class who perform the labor of a community—not simply the wage workers, but of all occupations—between the ages of ten and sixty years?

In estimating such loss recourse cannot be had to the usual life expectancy tables, for the lives of the working people, as a mass, are not the people upon whom life insurance tables are based.

There are not definite statistics at hand to formulate an exact account of the loss. It must, therefore, be approximate, and exemplary.

As a basis of calculation, an estimate made by Mr. Sutton, Actuary to the Registry of Friendly Societies in England, and presented to the International Health Exhibition, at London, in 1884, by Sir James Paget, is taken, as covering a class similar to that under consideration. In his address he says: "In his (Mr. Sutton's) office are the returns for many years past of the sickness and mortality of the very large number of members in these societies, and among other things there is recorded the number of days for which each member, when 'off work' on account of sickness, received money from his society. Hence, Mr. Sutton can estimate the average number of days' sickness and consequent loss of work among the several hundred thousand of the workmen and others who are members of these societies. From the entire mass of these returns he deduces that the average number of days' sickness per member per annum is very nearly one and one-half weeks, and this estimate agrees generally with the estimates made in other societies by Mr. Nelson, and others. But the averages thus obtained include the cases of members of all ages, and among them many cases of chronic illness and inability to work during old age. In order, therefore, to get a better idea of the actual annual loss through sickness he has calculated the average annual number of days' sickness of each person during what may be termed the normal working time of life, that is, between fifteen and sixty-five years of age. This he has done among the members of the large group of friendly societies known as the Manchester Unity of Odd Fellows. They are not strictly selected, but they are such persons as are able, when in good health, to earn good wages or salaries, and the fact of their joining these associations seems to show them to be comparatively thrifty and careful persons. They do not, at all events, include many of those who do but little work, if any, or no work at all. They include very few habitual drunkards, cripples, or those who are entirely invalids. They include very few of those who, through weakness and disease or mere profligacy, cannot earn enough to become a member of a society whose dues it appears are small. They include, also, very

few of the insane, or imbecile, or idiotic. With such a class of persons as a basis, he calculates that the annual loss of work per individual is 1.314 weeks. That is, a small fraction more than nine days in each year. The loss is a little more than that for women, it being 1.334 weeks; so that by taking the general average as nine days we certainly will escape the risk of going above the mark of actual occurrence. The membership of these societies is between three hundred thousand and four hundred thousand, so that the figures are fairly large enough to prevent error on account of the meagerness of material upon which the estimate is based."

For the purpose of computation, apply these figures to one hundred thousand of our own population—those engaged in active business of the country. Assuming they will each lose nine days each year by illness, it would be nine hundred thousand days. Estimating the value of this labor at one dollar per day, the aggregate is nine hundred thousand dollars per year. Bear in mind this is only for the loss of time. It does not include the cost of care and maintenance necessitated by sickness. Each sick person requires the time and attention of another person, who is also deprived of productive labor. Added to this must be the medical attendance, and the cost reaches an almost incredible amount.

What are the causes of this sickness? The vital statistics of all countries, and of cities show that a large majority of them are preventable. In Iowa over one thousand persons die from typhoid fever; over two thousand from consumption; over fifteen hundred from diphtheria; over one thousand from scarlet fever and measles each, annually. Take typhoid fever as an example, the mortality from which is one thousand per year. This number of deaths, according to most reliable statistics, would represent about twenty thousand cases, nineteen thousand of whom made a more or less complete recovery, and one thousand died. The average duration of typhoid fever is ten weeks. Here we have a loss of one hundred and ninety thousand weeks in one year from only one disease, and that one of the most preventable. Fixing the expense of this sickness at the low average of eight dollars per week, the aggregate is one million five hundred and twenty thousand dollars per year, which, from a sanitary standpoint, is an absolute loss and waste.

Sir James Paget estimates the cost in the city of London, at twenty million pounds annually, chiefly from loss of labor by sickness from clearly preventable diseases.

Add to this the loss in the mortality of the one thousand, and what do we find? Statistics show the mortality from typhoid fever is greatest in the ages from fifteen to twenty-five years, the average being twenty-three years. These are the workers of a community—the strong, the robust.

Dr. Farr, the well-known statistician, and author of the life tables adopted by insurance companies the world over, fixes the future wages of a laborer at the age of twenty, at six hundred and thirty-seven pounds; of a professional man with a moderate income of two hundred and eighty eight pounds per year, at five thousand three hundred and twenty-nine pounds at the age of twenty-five, and six thousand and thirty-eight pounds at the age of forty; of the whole community, men, women and children, at one hundred and fifty-nine pounds ($772.74). Assuming that the productive value of the one thousand who die from typhoid fever is six hundred and thirty-seven pounds ($3,095.82), the lowest estimate of Dr. Farr, we have six hundred and thirty-seven pounds, or three millions, ninety-five thousand, eight hundred and twenty dollars money loss. Summarized, this account would show the money loss to be in the one thousand deaths:

Labor value,	$3,095,820
Sickness, expense ten weeks each,	800,000
Funeral expense at $25 each,	25,000
	$3,920,820
Sickness of 1900,	152,000
Total annual loss,	$4,072,820

Turning now to the children, we find the loss enormous. While it is true they are not the workers, but are consumers, they have cost money. If they do not survive the worker will not be forthcoming to reinforce the ranks depleted. It is from the infant class the waste must be supplied. So, then, these lives have an economic value, which must be taken into this account. Over six thousand children died last year in Iowa, under ten years of age, of whom over three thousand were from diphtheria, scarlet fever, and other preventable diseases. Assuming that the average cost of rearing these six thousand children to the time of their decease is fifty dollars each, we have an actual loss of three hundred thousand dollars, which is irreparable; for the dead are gone forever. Assuming again that

the cost of sickness of these is twenty dollars each, we have an additional loss of one hundred and twenty thousand dollars, or a total loss of four hundred and twenty thousand dollars, one-half of which may be charged to defective sanitation. This does not include the much larger number of cases of sickness and recovery, the expenses of which would be not less than one million dollars.

Take now the loss from diphtheria:

1,500 lives at $50		$ 75,000
Sickness expense at $20 each		30,000
Burial expense at $15		225,000
	$	430,000
7,500 cases, sickness and recovery		150,000
Total loss	$	580,000

For scarlet fever we have:

1,000 lives at $50	$	50,000
Sickness expense at $20		20,000
Burial expense at $15		15,000
	$	85,000
9,000 cases, sickness and recovery		180,000
Total loss	$	265,000

For measles, we have:

1,000 lives at $50	$	50,000
Sickness expense at $10		10,000
Burial expense at $15		15,000
19,000 cases, sickness and recovery		190,000
Total loss	$	265,000

Here we have an aggregate loss from the four diseases, typhoid fever, diphtheria, scarlet fever, and measles, to-wit:

Measles	$	265,000
Typhoid fever		4,072,820
Diphtheria		580,000
Scarlet fever		265,000
Total	$	5,182,820

In this account no estimate is made of the productive value of the three thousand five hundred children who died.

In order to estimate the value of life in hard, cold money, we must apply business principles. We must bear in mind that in its production a certain amount of money, as capital, is invested, to reappear in the labor of the man. The labor of the parent, expense of nurture, clothing, and education are all investments, as capital, to be returned in the earnings and income of the survivor. This investment increases, up to a certain age, when the earnings begin, soon equaling the outgoings, and exceeding the outgoings through manhood to old age, when they become extinguished. The present value of a person's probable future earnings is that minus the probable outgoings in realizing those earnings. Dr. Farr fixes the earning value of a person at twenty years at two hundred and thirty-four pounds, or one thousand, thirty-seven dollars and twenty-four cents. Assuming that fifteen hundred of these children would reach twenty years, there is a further loss of one million, five hundred and fifty-five thousand, eight hundred and sixty dollars, and for this loss the commonwealth and the community are directly responsible, the causes of the death being admittedly preventable, and permissible only through violation of sanitary laws and gross neglect of social duty as citizens.

These figures show conclusively that there is a money value in preserving the health of the people, and in extending the duration of life, because it extends the power of labor, and adds to the wealth of the community in which they live.

Can this waste of money and loss of life be diminished? It certainly can. It certainly is being done. Improved sanitation, general diffusion of knowledge of hygiene, would reduce the rate of sickness and death very largely. In no city in the world, perhaps, are sanitary measures more rapidly enforced than in London, and under these restrictions seventy thousand lives are saved annually. The report of the Michigan State Board of Health for the year 1890, gives tables showing that under the restrictive measures of isolation and disinfection, there were saved in that year from death by scarlet fever, four hundred lives; from diphtheria, seventeen hundred. With a complete sanitary system of drainage, sewerage, and water supply, the report estimates a saving of nine hundred lives, and nine thousand cases of sickness per year.

From these figures it can be seen that sanitary supervision is conducive to economy. As to economy, Carlyle says: "A poor

Irish widow, in one of the lanes of Edinburgh, went forth with her three children, bare of all resource, to solicit help. Sent from one to another, helped by none, till her heart and strength failed, she sank down in typhus fever, died, and infected the lane with the fever so that seventeen other persons died there in consequence. Would it not have been economy to have helped this poor woman? She took typhus fever and killed seventeen others!"

Sanitary science is making rapid progress throughout the world. Philanthropy and charity have joined hands in the emancipation of the people from disease and premature decay, by investigation, the acquirement of practical knowledge, and the adaptation thereof to practical results which have already been accomplished. A universal application of the knowedge of sanitation and hygiene already gained, would be a good business investment in any community, by the increased wealth-producing labor, increased population, and increased sum of general happiness; for one of the main elements of happiness is health. "It," says Livy, "is the possession of no class or rank, and may bless the pauper whilst it is denied to the monarch. Compared to health all the luxuries of wealth, and all the trappings of pomp are as nothing."

Carry this possible improved condition on through a decade, and there would be reached and diminished, another class, not only work-wasting, but chargeable upon the community—the insane and the imbecile.

Sanitation is self-preservation. "The moral of self-preservation," says Dr. Sykes, "has, at the first blush, the ringing sound of a supremely selfish act; but when the enemy comes in the form of disease that cannot be fought in a spirit of individualism, but must be repulsed with a spirit of socialism—in the truest sense of the word—and with a love for your neighbor as great as for yourself; when you appreciate that in preserving the child you preserve the man; that in preserving your neighbor you preserve yourself and your kindred, then does self-preservation call forth the kindest motives and the most unselfish acts; then is the sanitary worker, whether voluntary or official, no longer looked upon as an intruder, but welcomed as an adviser and protector; and when neglect of those precautions that should have been taken result in the death of a neighbor, if you ask, 'Am I my brother's keeper?' let it be remembered you are."

Hygiene goes hand in hand with Sanitation. The cure of diseases by remedies has its unbelievers, but Hygiene has none. Her language is intelligible to every enlightened mind. She imposes no sacrifices for the services she renders. The expenditure she necessitates find compensation in health; for nothing is so expensive as sickness. An expenditure to improve and secure health is practical economy.

So far advanced already is sanitation that contracts may be made to reduce the death rate in any community one-half in less than a decade, and secure the abolition of so-called children's diseases. This being true, and as the public health is the supreme law, it is clearly the duty of the legislature, as well as all municipal authorities, to aid Philanthropy and Charity in diminishing this enormous and extravagant waste of money and wealth-producing element of the commonwealth.

ANIMAL DISEASES.

AN APHTHOUS AFFECTION AMONG DAIRY COWS OF THE STATE.

M. STALKER, D. V. S.*

The following is an extract made from a report sent to the governor concerning a disease which recently appeared on a number of farms in the eastern and southern counties of the State:

AMES, August 12, 1891.

GOVERNOR BOIES, Des Moines:

Dear Sir:—I have just returned from a tour of inspection among the diseased cattle of Tama county. Your attention has doubtless been called to a disease that has become quite general in southeastern Iowa within the last two or three weeks. Several newspaper accounts of the trouble have appeared from time to time, some of which give a pretty clear account of the disease. So far

*State Veterinary Surgeon.

as I have been able to learn, the disease is confined to cattle alone. Milch cows seem to be most susceptible, but no class is entirely exempt. The disease is a form of aphtha, though differing, I think, from any form of the disease heretofore definitely described.

The most characteristic symptoms consist of soreness of the mouth, producing salivation and loss of mucus membrane of the tongue, lips and nose, soreness of the feet, eruption of the skin on the teats and udders of cows, with some elevation of temperature, and rapid emaciation. The tongue in some instances becomes so swollen as to protrude from the mouth, becoming dry, cracked and very painful. Canker-like ulcers invade the mucus membrane of the mouth, especially the dental pad against which the incisor teeth rest, thus rendering it impossible for the animal to crop the grass. This inability to eat causes, in a large measure, the rapid loss in flesh. The lips, tongue and nose are covered with dark-colored scabs in aggravated cases, and not unfrequently the membranes of the nasal passages are involved, causing a profuse discharge. The lesions on the udder and teats are not of so severe a type, usually consisting of slight superficial cracks, and a sunburnt appearance of the general surface. This condition, however, is evidently associated with a considerable degree of pain from the resistance the animal makes against being milked. A rapid falling off of the flow of milk is a noticeable symptom, and often precedes any external evidence of the disease. In none of the cases I observed was there any abrasion of the skin of the legs or feet, though this does not coincide with observations made by some others who have investigated the same disease. In the cases I examined, the foot trouble seemed to be confined to the deeper structures, associated with swelling and fever about the pastern joints, not unlike the effects of rheumatism.

Locomotion is performed with pain and difficulty, and often the animal will rise to its knees and stand in that position, refusing to get upon its feet from the pain induced by standing. The symptoms as given above, would apply to the more severe type of the disease. In many instances the foregoing symptoms are so modified as to severity, that it would require close attention to recognize their presence. In such cases the animal continues to eat and drink, and in the course of a few days is restored to normal conditions of health.

There are two questions the farmer will invariably ask of the man who goes to his farm with the intent of investigating the outbreak. First: "What causes it?" Second, "What am I to do?" The second question is easily answered; the first is not. Let us take the easy one first. In a majority of instances the disease is of a mild type, and recovery will take place in from one to two weeks without giving the case the slightest attention. The more severe forms require treatment. This, for the greater part, will consist in astringent and antiseptic applications to the diseased surfaces. For the abrasions in the mouth and on the lips, probably nothing is better than a saturated solution of borax or chlorate of potash, to which one per cent of carbolic acid may be added. This should be applied to all raw and ulcerated surfaces by means of a soft swab, and should be repeated several times each day until the patient is convalescent. Either the borax or chlorate of potash can be finely pulverized and mixed with two or three times its bulk of salt, and given to cattle with the milder form of the disease, thus saving the labor of catching and confining a large number of refractory animals. I observed that animals suffering with the disease, even in quite a severe form, would take salt readily. For other parts of the body, where abrasions occur, a mixture of carbolic acid and glycerine, in the proportion of twenty parts of glycerine to one of the acid, will be found a suitable application. Animals not able to graze from the severity of the disease, should be given bran mashes, or other soft food, until the more active stage of the disease is passed. Other complications, as constipation, will have to be treated as they arise. If the above precautions be taken with reference to the worst cases, the loss from death will be practically nothing.

The responsibility of all parties does not end with the proper treatment of the sick. I am receiving many letters from dairymen wanting to know what they must do, and whether the dairy products from such cows should be placed upon the market. Allow me to say once for all, that the milk from no diseased cow should be used as an article of human food. Even an injury that would be sufficient to produce a rise in temperature is sufficient to condemn the milk of the injured animal. It is not likely that the present disease would be reproduced in the human being by the use of the milk from an affected animal, but both common prudence and common

decency forbid its use as an article of food. It may with propriety be given to the lower animals after it has been boiled. I am not of the opinion that the milk from any herd where the disease exists should be used, though reasonable precautions are taken to exclude the milk of animals actually suffering from the disease. There is an early febrile stage of the disease which may escape detection, and during which the danger may be quite as great as during the more active stages of the disease. It is certain that an exceedingly disagreeable odor is given off from the heated milk. This can even be detected in cheese made from such milk. I had an opportunity of examining such a product, made for the express purpose of testing the quality of the cheese. It is my judgment that local boards should insist on this precaution.

As to the cause of the disease, I am not able to give a satisfactory answer. In fact I have not taken the time to make a study of this feature of the subject before giving you the benefit of such facts as I believe the public should have as speedily as possible. The cause will call for time and careful study to elucidate, or at least much time and pains may be necessary to arrive at right conclusions. This, however, will make little difference in the line of work that will fall to the lot of the average cattle owner. I reserve for a later time, and after more mature study of the question, my judgment as to the cause. I have already said I do not think the disease has been described in works on veterinary science, or if so, the present outbreak is so modified by local conditions, as to produce symptoms widely different from anything coming under my observation. My attention was first called to the disease some three weeks ago, in the southeastern part of the State, but under conditions that did not create suspicion of anything unusual. Since that time cases have been reported to me from a large number of localities in almost one-fourth of the State. From the most recent information I have, it is as far west as Monroe county, along the line of the C., B. & Q., and Tama county on the C. & N. W. Before this reaches you, the affected territory may be greatly extended. There are some facts that would indicate that the disease spreads by contagion, while other evidence would seem to point to other sources of poison. I do not anticipate any serious loss to the stock interest of the State as a result of the disease.

There will be more or less temporary embarassment of the dairy interest, and a notable shrinkage of the product for a time. The disease runs its course quite rapidly, and from what I am able to see of it, my impression is that a few weeks will bring us out of the serious part of the difficulty.

It makes its appearance in a community so suddenly, and affected herds are reported in such rapid succession as to defy all attempts at quarantine, were it evident that such measures if enforced would prove availing against further spread.

M. STALKER.

[Since writing the above, numerous letters of inquiry have been sent to the sections of the State where the disease has been most prevalent. From the best information I am able to gather from answers to these letters, it seems that there have been a number of new cases, though but few have assumed an aggravated type; and the loss is trifling except in the way above indicated.

At this date, October 24th, the disease appears to have practically disappeared from the State, so far as I can learn. It seems to have been self limited; disappearing in a manner as little to be accounted for as was its appearance. I have not as yet completed any work that enables me to assign a satisfactory explanation as to the cause. It now seems more than probable that some cases of the same disease existed during the Summer of 1890. Its appearance again during the Summer of next year need not be a matter of surprise.

WATER SUPPLY FOR LIVE STOCK.*

There is no fact better known to the sanitarian, than that one of the chief sources of danger to life and health, is the contamination of drinking water. If a malignant form of fever makes its appearance in a family, which can not be explained by the history of actual exposure to contagium, the water supply always comes in for an early and liberal share of attention. The instances are sufficiently numerous in which the investigator is enabled to trace the malady to this source, to warrant every reasonable precaution in procuring a pure water supply. Nor are these facts known to the sanitarian alone. The reading public have been sufficiently enlightened on

*By Prof. M. Stalker, State Veterinary Surgeon and ex-officio member of the State Board of Health.

this subject to enable them to avoid much of the danger from this source. While we are beginning to take a fairly lively interest in our personal dangers, and the methods calculated to avert them, we have yet hardly taken time to consider the economic question of how far our live stock industry may be affected by the same class of causes. We drill down into the solid rock to procure a water supply of unquestioned purity, for family use. We boil or subject to other purifying means, all suspected samples before they can be used. This is well. But all this time our helpless, dumb creatures may be compelled to drink from a shallow slough, foul with decomposing vegetation, or from a surface pond almost at boiling temperature under a summer sun, where the minute forms of animal and vegetable life gender in such profusion as to render the whole a mass of animate slime. Not one who has had a glimpse of the microscopic world, would expect a human being to take a draught of such a beverage and live. But our animals are not only expected to live, but to thrive under such conditions. That these expectations are frequently disappointing, I will cite an instance or two in proof. During the latter part of the Summer of 1890, I had occasion to investigate a severe outbreak of disease on a farm in one of the counties of Iowa. The animals, including horses, cattle and pigs, were all affected in the same way. The local symptoms were largely confined to the throat. There was swelling, partial paralysis of the walls of the upper air passages, and painful and difficult breathing. The animals attacked uniformily died after an illness of about two days. The disease I could not recognize as belonging to any of the well defined types with which I was acquainted. Here were horses, cattle and pigs, sick and dying with disease showing the same symptoms in all. There are few if any of the specific forms of disease that spread as epizootic among the widely differing species of domestic animals. I could not classify the disease, and at once set about the task of discovering if possible, some common source of exposure. The pastures, buildings and water supply were each in turn subjected to careful scrutiny. The buildings were such as are to be found on ordinary Iowa farms, fairly comfortable and clean. I could find no clue in the quantity or quality of feed that promised to lead to a solution of the difficulty. On investigation of the water supply, I found that most of the animals on the farm drank from a small creek that

ran a zigzag course through the premises. The stream was in part supplied from a series of springs, and in ordinary seasons afforded a fair amount of water, which ran, at least for a part of its course, over a gravelly bed. The dry Summer of 1890, with several previous ones, showing an abnormal light rainfall, had so reduced the amount of water that it had ceased to run. On making examination and conducting inquiries, I ascertained that it had been the custom on the farm to throw the carcasses of animals down the steep bluffs into the bed of the stream. I further learned that during this Summer, chicken cholera had prevailed on the farm, and that a large number of chickens had died and been thrown over the bank. I was also informed that hog cholera had caused the death of a considerable number of swine, the carcasses having been treated in a similar manner. The several yards occupied by horses, cattle, pigs and barn yard fowls, were on the hillside with abrupt drainage into the creek. In addition to this, large heaps of fermenting manure were deposited about the foot of the hill near the edge of the stream, where the animals went to drink. A few of the animals on the farm had not had access to the stream, but had been watered from a well. None of these had showed signs of sickness, though they had been in daily contact with those that had their water from the pools in the bed of the stream, and even with some of the sick. On looking up the local geography of the neighborhood, I found that a number of farmers had built their homes along the banks of this stream, and had been accustomed to make use of it in much the same way as the farmer above referred to. Inquiry elicited the fact that on no less than four farms situated on the banks of this stream, animals had died showing symptoms identical with those on the farm first investigated. I regarded the evidence as sufficient to make out a strong case against the impurity of the water and gave an opinion accordingly.

The above is but a single instance of many that have come under my observation. It is one of the most glaring, but by no means one attended with the greatest degree of loss. On another occasion, where a high rate of mortality had prevailed among the cattle running on the open prairie, I was able to trace the cause to contamination of surface water. An animal dead from anthrax had been drawn into a basin on the open prairie. Later the rains filled the

basin with water, and about one thousand cattle on the range had access to the pond for water supply. The result was that about ten per cent of all the animals having access to the impure water, died from anthrax. The teachings of these object lessons are sufficiently obvious. These animals are endowed with organizations not unlike our own, and the manifest laws of being and of health can no more be violated with impunity by them than by ourselves.

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