SECOND

BIENNIAL REPORT

OF THE

STATE BOARD OF HEALTH

OF THE

STATE OF IOWA,

FOR THE

FISCAL PERIOD ENDING JUNE 30, 1883.

DES MOINES:
GEO. E. ROBERTS, STATE PRINTER.
1883.

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

IOWA STATE BOARD OF HEALTH,
OFFICE OF SECRETARY,
DES MOINES, June 30, 1881.

To HON. BUREN R. SHERMAN, *Governor of Iowa:*

I have the honor to herewith submit the report of the State Board of Health of Iowa, through its Secretary, R. J. Farquharson, M. D., for the fiscal period ending June 30, 1883.

W. S. ROBERTSON, *President.*

MEMBERS OF THE BOARD.

‡WILLIAM S. ROBERTSON, Muscatine, President; term expired January 31, 1881.

WILMOT H. DICKINSON, Des Moines; term expires Janury 31, 1889.

**S. B. OLNEY, Fort Dodge; term expires January 31, 1890.

JUSTIN M. HULL, Lake Mills; term expires January 31, 1884.

PHILIP W. LEWELLEN, Clarinda; term expires January 31, 1885.

HENRY H. CLARK, McGregor; term expires January 31, 1886.

EPHRIAM M. REYNOLDS, Centerville; term expires May 31, 1887.

JAMES L. LORING, C. E., Dallas Center; term expires May 4, 1887.

*SMITH MCPHERSON, Attorney-general, *ex officio*.

†R. J. FARQUHARSON, Secretary; Des Moines.

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*Succeeds J. F. McJunkin, whose term expired January 1, 1881.

†Succeeds L. F. Andrews, whose term expired May 5, 1881.

‡Reappointed by the Governor, January 29, 1881; term expires January 31, 1888.

**Succeeds Geo. F. Roberts, whose term expired January 31, 1883.

CONTENTS.

ERRATA.

The title of "Northern Division" should appear over Cerro Gordo county, page 178; the title of "Western Division" over Shelby county, on page 203.

On page 319, the total footing of the Financial Statement should read to-wit:

Total miscellaneous	$7,239.64
Expenses of Board meeting	739.00
Total expenditures	$7,978.64

On page 321, the total of classified expenses should read $7,978.64.

PREFATORY.

To Buren R. Sherman, *Governor:*

Herewith is presented the Second Biennial Report of the State Board of Health for the fiscal period ending June 30, 1883, together with the vital statistics for the year ending October 1, 1881. These statistics are incomplete, and altogether unsatisfactory and cannot be otherwise under existing laws, and this will continue until there is a complete registration of all persons practicing medicine within this State. As it is of the utmost importance that these statistics should be complete, such legislative action, therefore, should be had, as will tend to secure this result.

The State Board of Health has been in existence three years. That it has accomplished some of the objects for which it was created is evident from the hearty indorsement received from all portions of the State. As stated in the former Report, the principal work of the board has been to educate the people as to the importance of better sanitary and hygenic conditions; to teach them how to escape sickness and death; to impress upon them the clearly ascertained fact that many diseases are preventible, and to disseminate the means of avoiding such.

The wisdom of the Health Law, and the efficiency of the State Board of Health, has been abundantly demonstrated during the presence of contagious diseases, which have prevailed over the State during the last year. The subject of sanitation has, therefore, been forcibly brought to the notice of the people in such manner as to demonstrate the relation of cause to effect. The masses of the people have thus far evinced marked readiness of conviction, when the proof is clearly presented. A large number of cases of fatal disease traced to preventable causes has greater influence on the public mind than claims of statistics, or pages of written theories and assertions. To trace out, and explain pathological results from physical causes, is

largely the work of the State Board of Health. New sources of danger to the public health are constantly being investigated, and the old more vigilantly restricted. The result has been satisfactory, and its impression has already been made upon the people, as evidenced not only in the action of individuals but of communities. Frequent inquiry from all parts of the State indicate conclusively that public sentiment is aroused to the importance of improved sanitation. The secular press has also awakened to the value of this work, which bears so intimate relations to the most vital interests of the State and the individual. The rapid increase of periodicals devoted exclusively to sanitation and hygiene; the numerous organizations of voluntary health associations, comprising the ablest minds of all professions and trades—all indicate progress in this direction. No retrograde movement has been made. Twenty-seven States now have State Boards of Health. In no State has one been abolished, but on the contrary, they have been given increased support and power, and vested with extended authority to secure more complete results.

Practical experience has demonstrated the necessity for greater executive powers and authority, vested in the State Board. Contingencies constantly arise, where local influences prevent the operation of the health law. Authority should rest somewhere to secure to communities the benefit of the statute, and nowhere could this be lodged, with a view to impartial judgment, more safely than with the State Board of Health. As the statute now is, this body has only advisory powers; it should have mandatory authority, and its rules and regulations have full statutory force and effect.

The changes in the law, which experience has proved necessary, will be presented to the next Legislature, in carefully devised measures, which will be fully and thoroughly discussed before the proper committees, to the end that the object and intent of the law may be more fully accomplished.

REPORT OF MEETINGS OF THE BOARD.

PROCEEDINGS OF MAY MEETING, 1882.

MUSCATINE, May 2, 1882.

Pursuant to adjournment the State Board of Health met in Muscatine, in the office of Dr. W. S. Robertson, at 10 A. M.

Present, Drs. Robertson, Dickinson, Hull, Reynolds and Lewellen.

The President, Dr. Robertson, in the chair.

The minutes of the last meeting were read and approved.

Upon the call for reports of standing committees,

Dr. Hull's report on Ventilation was continued until the next meeting.

The name of Dr. Olney was substituted for that of Dr. Robertson on the Committee on Education.

On motion, the name of the Secretary was added to the Library Committee.

On motion of Dr. Lewellen, $500 was appropriated to be expended in the purchase of the nucleus of a library.

Dr. Dickinson stated that he made to the last Legislature his report on the sanitary condition of the Reform School at Mitchellville.

The report of the Secretary was then read and approved, as follows:

REPORT OF THE SECRETARY.

Gentlemen—I have the honor to report as follows: The printing of the first biennial report was so delayed that a small edition of three hundred copies was only ready for distribution among the members of the Legislature two days before the final adjournment. An act (S. F. 322) was passed which will prevent this in the future. The act provides for the printing of the reports of public officers and institutions before the time of meeting of the Legislature.

A list of amendments to the State Board of Health act, which was carefully prepared by the "Committee on Legislation," consisting of

the President, Dr. Dickinson and the Attorney-General, failed to pass through the apathy and indifference of the Senator in whose hands it was placed.

A measure, proposed by the Senator from Scott county, for the abolition of all boards of health, except those in cities and towns, with population of three hundred or more, also failed to pass.

The following acts became laws, all having more or less connection with public health:

I. House File, 31, an Act to amend chapter 159, section 3 (acts of 1876), in relation to the printing and distribution of public documents. This act makes provision for the printing and distribution of 5,000 copies of the report of the State Board of Health, one copy of which shall be sent to the clerk of each local board of health.

II. Senate File, 129, an Act granting additional powers to cities organized under the general incorporation laws of the State: providing for taxing "*itinerant doctors*," junk dealers, etc.

III. Senate File, 59, an Act authorizing cities acting under special charters, to cause land upon which there is stagnant water, to be filled up or drained, and providing for the collection of the expenses of such work.

IV. House File, 128, an Act to provide for the publication of city and town ordinances in book or pamphlet form, and for the taking effect thereof. (Health ordinances may be published in pamphlet form).

V. House File, 244. An Act empowering cities under special charter to establish boards of health. Allows Davenport, Dubuque and Keokuk to have boards composed partly of members of the city council, and others not in any official capacity.

VI. Senate File, 322. An Act in relation to the reports of public officers and institutions, and to provide for the printing and distribution of public documents. The act requires reports to be made and printed before the time of the meeting of the legislature.

VII. House File, 306. An Act to punish and prevent the adulteration of food, drink and medicine, and the sale thereof when adulterated.

VIII. Senate File, 195. An Act amending section 3, chapter 151 (acts of Eighteenth General Assembly), relating to fees of clerks of District and Circuit courts. This act adds to said section 3, the following: "For which service the clerk shall receive, in addition to the compensation already allowed him by law, the sum of ten (10)

cents for each birth, death or marriage so recorded by him, and the further sum of ten (10) cents for each hundred words of written matter contained in said report, the same to be paid out of the county fund.

NEW AND COMPENDIOUS FORM OF PHYSICIAN'S REPORTS OF BIRTHS AND DEATHS.

The forms now in use for births and death are so large and cumbrous, as to render it exceedingly inconvenient, if not impossible, to physicians to carry them about. As a necessary consequence of their absence at the very time they are actually needed for a correct notation of facts, the reports are meager and imperfect, if reliance is placed upon the memory alone, and oftentimes no record at all is made. To remedy these defects, the accompanying form was devised and is herewith submitted. These certificates, each three by seven inches, are bound in books of fifty, and by means of a punched line are easily torn out, leaving every tenth page as a stub, or permanent record of the preceding ten cases. The certificates of still-births are in the back part of the book of births, and with the corresponding stub are printed on blue paper. Sample copies of these books were distributed to each manufactory of blank books, to the clerks of courts and to the members of the State Board of Health.

The following circular accompanied the samples of certificates:

STATE BOARD OF HEALTH,
OFFICE OF SECRETARY.
DES MOINES, IOWA, March 25, 1882.

Clerk of the Circuit and District Courts—Herewith we send you samples of a new and condensed form of Return of Births and Deaths by Physicians, which you can adopt when requiring a new supply. This form has been prepared for the convenience of physicians, to carry in their pockets.

R. J. FARQUHARSON, *Secretary.*

DISTRIBUTION OF THE REPORT.

Chapter 157, section 3, as amended by the last Legislature, requires a copy of the report to be sent to the clerk of each local board of health. To facilitate a compliance with the provisions of this act the following circular was sent out:

STATE BOARD OF HEALTH,
SECRETARY'S OFFICE,
DES MOINES, IOWA, March 25, 1882.

To the County Auditor—Under the provisions of sections 14 and 15, chapter 151, Acts of the Eighteenth General Assembly, clerks of townships, and

clerks and recorders of cities and towns, are made clerks of local boards of health, and said clerks are required to make report to the State Board once each year, and at such other times as the State Board may determine. The State Board respectfully ask you to report to this office the name and post-office address of each township clerk in your county, and also the clerks and recorders of cities and towns so far as possible. Please give the clerks of cities and towns separate from those of townships. Enclosed herewith are blank forms for such return.

Yours very respectfully.

R. J. FARQUHARSON,
Secretary of the Board.

After the clerks of local boards are supplied, copies will be sent to health officers of cities, towns and townships, as far as the supply of unbound copies alloted to us will go.

To each member of the State Board two (2) bound and ten (10) unbound copies have been sent. Of the bound copies, one has been sent to each State Board of Health, to the National Board of Health, and to the Surgeon-Generals of the Army, Navy, and United States Marine Hospital Service. Copies were also sent to some health officers of cities who have favored us with their reports. A copy was sent to the Commissioner of Inland Revenue of the Dominion of Canada, from whom we have received a complete set (six volumes) of the valuable reports of that department, on the adulteration of food, together with separate pamphlets containing analysis of drinking waters, and the act to "prevent the adulteration of food, drink and drugs." A copy was sent to the Tokio University, Japan, in hopes of getting in return the three annual reports of the Central Sanitary Bureau of Japan.

From a study of these reports much sanitary information will no doubt be derived, and perhaps a great increase of sanitary wisdom. If we should find there a confirmation of what seems now only "traveler's tales," that among a population crowded beyond any of our experience, that in a country entirely destitute of water-supply, sewers, water closets, indeed, of all the means and appliances deemed by us essential to modern sanitary civilization, the filth, diseases, diphtheria, typhus and scarlatina, those apparent scourges of neglect and dirt, should be very scarce, and others again unknown.

CORRESPONDENCE.

The following correspondence is considered of sufficient importance to report:

A NUISANCE AT COLFAX, JASPER COUNTY.

October 8, 1881, a committee of citizens complain that the local board refuses to act in the case of a nuisance.

To which the following reply was sent:

IOWA STATE BOARD OF HEALTH,
OFFICE OF THE SECRETARY,
DES MOINES, IOWA, October 11, 1882.

MESSRS. HOLLAND, INERMIRE, WILEY, AND BAKER, *Colfax, Iowa:*

Gentlemen—Your joint letter of the 8th inst. reached me to-day, through the hands of Dr. Kennedy.

The State Board of Health has no power to act directly in the abatement of nuisances. This power is entirely in the hands of the local board of health. If this board refuses or neglects to act, you can proceed by *mandamus* to compel it to do its duty, or you can, under section 3331 of the Code, bring a suit against the party creating the nuisance, either for abatement or damages, or both.

Yours truly,

R. J. FARQUHARSON,
Secretary.

SALE OF COAL OIL.

From Prof. Elliot, of the School of Mines, Columbia College, New York, asking for a copy of the law of Iowa in regard to the sale of coal oils, and their action. Copies of the law were sent, and reply made that the act was a dead letter, from being permissive and not mandatory, and from the smallness (5 cents) of the fee for inspection.

DRAINAGE OF WET LAND.

J. B. Graham, clerk of Pleasant Valley township, Carroll county, sends the following:

To the Secretary of the State Board of Health:

Sir—When there is wet land, that the local board of health thinks against the public health, can they compel the owner to ditch said land?

Reply of November 25, 1881.

"You can proceed by civil action, in any court having jurisdiction, against the owner of the land, and if you gain the suit, he will be obliged to drain

it; this according to section 18, Board of Health act. But it will have to be proven that the wetness of the land has actually produced sickness. It is not sufficient that the board thinks it might produce sickness, as in the case of an ordinary nuisance, which they have the right to abate peremptorily."

DANGER FROM ICE-WATER.

Dr. A. W. Cantwell, health officer of Davenport, Scott county, under date of October 27, 1881, inquires in regard to the danger of using ice cut below the city. The reply was as follows, viz:

"Ice is always purer than the water from which it is formed. Davenport ice contains in 1,000,000 parts 0.19 of albuminoid ammonia, while the river water has 0.32 parts; however, ice cut from the Des Moines river contains only about one-fourth (¼) of that in the Davenport ice, *i. e.* 0.05 parts."

Dr. C. H. Cogswell, of Cedar Rapids, under date of October 27, 1881, complains of the failure of physicians to report births and deaths.

Reply was made that this failure was not peculiar to Cedar Rapids, but was general, and that nothing could be done to correct this evil until we had a compulsory registration of all persons practicing medicine.

SCHOOL-HOUSES AS SOURCES OF DIPHTHERIA.

WAUBEEK, LINN COUNTY, November 9, 1881.

To the State Board of Health, Des Moines:

Gentlemen—We were appointed by the Independent School District of Waubeek a committee to confer with you in regard to holding a winter term of school.

This action was based on the following facts:

Waubeek is a small town of 300 inhabitants. Two years ago last August several deaths occurred here from diphtheria. At that time many of the inhabitants believed it not contagious, and of course pursued no system of disinfection. After the disease had subsided the winter school commenced and it broke out again in school, and several more deaths occurred. We have three terms of school each year, and every term but one, since the first outbreak, it has invariably appeared shortly after the commencement, or during each term. Since the last week in June twelve deaths have occurred in Waubeek and vicinity. Our school-house was painted inside and white-washed before the fall term commenced. It is built of brick; two stories. The space between the lower ceiling and upper floor is filled with saw-dust. The floors are out of repair and filled with filth. Under the floor is a space, four feet high, unoccupied.

Will you be so kind as to answer the following questions, and make such suggestions as you choose:

I. Would it be prudent, in view of the above facts, to convene our schools in winter session?

II. Ought the saw-dust to be removed from the house; and if so, what material should replace it to deaden the sound?

III. How should we disinfect the house to destroy the germs of diphtheria?

IV. Is it probable that diphtheria originated in the school-house this fall, or was it brought there from infected dwellings?

An early reply is requested, as we want to report on the 14th inst.

Yours, etc.,

(Signed) H. S. BISHOP, JOHN PENLY, E. A. WARNER, *Committee.*

Per H. S. B.

To which the following answer was sent:

IOWA STATE BOARD OF HEALTH,
OFFICE OF THE SECRETARY,
DES MOINES, November 8, 1881.

MESSRS. BISHOP, PENLY, AND WARNER, *Committee, Waubeek, Linn county, Iowa:*

Gentlemen:—Your kind favor of the 5th inst. came duly to hand. Diphtheria is undoubtedly contagious, and as much care should be taken to avoid spreading the contagion as in a case of small-pox. Unfortunately, we have for diphtheria no such certain preventive as vaccination for small-pox, and we are left to depend upon such means as isolation of the patient (as far as possible), and the destruction or rapid disinfection of all the usual carriers of contagion, such as rags and clothing, the discharges from the body, etc. Everywhere diphtheria increases upon the opening of the public schools in the autumn. It does not, however, originate in the school-houses, but in families, the school-house being only the means of dissemination, and very thoroughly it does its work.

No children should be allowed to attend school from any family having a case of diphtheria, not only during the existence of the disease, but for a further period, say a month, during which there has been a thorough cleaning and disinfection of the household, under the supervision (if possible) of an intelligent physician.

Of the school-house, nothing appears wrong, but the filthy floors and the saw-dust. The filthy floors should be removed and replaced with new ones. The saw-dust should be replaced with what is called "pugging." Cleats are nailed along the joists a little below their middle, upon them boards are placed so as to make a kind of loosely laid floor; over this is to be poured fluid cement or plaster, so as to form a layer of one or two inches in thickness. This will effectually deaden sound, and by rendering the floor impervious to air, will make the room above warmer and hence more comfortable for the children.

I. After the above changes it would be prudent to open the school.

II. This question is already answered.

III. There are probably no germs of diphtheria in the school-room; they are in the children.

IV. Diphtheria always originates in dwellings, the school-house being the focus whence it is spread among the community.

Yours truly,

R. J. FARQUHARSON,
Secretary.

NEGLECT OF LOCAL BOARDS OF HEALTH.

Dr. A. J. Christensen, of Lansing, Allamakee county, in a letter of November 9, 1881, complains of the conduct of the local board of health. To which the following answer was sent:

"The complaint made by you of the faults of the local board of health, both by omission and commission, are similar to many others which reach this office from various parts of the State.

"The State Board of Health publishes rules and regulations for the instruction of local boards, according to the law. It rests, however, with the various communities, such as townships, towns, and cities, to enforce these regulations. If they neglect or refuse to do so, they must suffer the consequences in the increase of disease and deaths, and the State Board cannot interfere, as its function is purely an advisory one."

REMOVAL OF DIPHTHERIA CORPSES.

PARKERSBURGH, BUTLER CO., IOWA, Nov. 14, 1881.

To the Secretary of the Iowa State Board of Health, Des Moines, Iowa:

Dear Sir—Does rule second of your board totally prohibit the removal of bodies from the State of those that died of diphtheria? My son died of diphtheria one year ago the 3d day of last April. Can I remove his body from the State? An early answer will oblige.

Yours, etc.,

W. H. OWEN.

This was referred to the President.

DES MOINES, November 11, 1831.

DR. W. S. ROBERTSON, *President Iowa State Board of Health, Muscatine, Iowa:*

Dear Doctor—I am just now in receipt of the above letter.

Rule second does not prohibit the transportation of diphtheria corpses in any case, no mention being made therein of the date, or even the existence of any previous burial. Now, an easy and direct answer, one consistent with our rules, would be that the body might be moved, with the precautions prescribed by the rules, but for the fact that there has been a previous decision of the board otherwise. In December, 1880, Dr. Harbach, health

officer of West Union township, Fayette county, submitted this question by asking permission to move three bodies of children, who had died of diphtheria in April and May previous. The matter was referred to Dr. Dickinson, and by him to yourself, and the permission, as I understand it, was refused.

The original draft of the rules as submitted to you contained the following, viz.: "The transportation of bodies of persons recently dead (*i. e.* within six months) of small-pox, yellow fever, or Asiatic cholera, is absolutely forbidden." In your letter of May 15, 1881, you say: "I question the propriety of allowing bodies dead of small-pox, cholera, or yellow fever, as well as of diphtheria and scarlet fever, from being transported at any time." But as subsequently adopted, the rules did not include diphtheria in the category of prohibition. My idea is that there is much less danger in transporting a body which has been dead and interred some time, than a recent corpse; because, according to my experience, putrifaction destroys the contagious germs, and undertakers and others are much more particular and careful in handling and preparing such bodies. I think, therefore, the rules should stand as they are, those disinterred for transportation being no exception to the others. These are merely my ideas on the subject; what you order shall be carried out.

Yours truly,

R. J. FARQUHARSON,
Secretary.

IOWA STATE BOARD OF HEALTH,
OFFICE OF THE PRESIDENT,
MUSCATINE, IOWA, November 15, 1881.

R. J. FARQUHARSON, *Sec'y I. S. B. of Health:*

Dear Sir—I think with the usual precautions of a cere-cloth, and an air-tight box, there would be little, if any, danger in the removal of Mr. Owen's son now, it being one year and seven months since his decease. But I would insist in the precaution of a proper preparation of the body as indicated in our rules.

Very truly yours,

W. S. ROBERTSON,
President.

IOWA STATE BOARD OF HEALTH,
OFFICE OF THE SECRETARY,
DES MOINES, November, 16, 1881.

W. H. OWEN, ESQ., *Parkersburg, Butler County, Iowa:*

Dear Sir—Yours of the 10th inst. came duly to hand, and was referred to the President. Any bodies may be removed, subject to the restriction of the rules, a copy of which is herewith sent for your information and guidance. In this case the same preparation of the body is to be made, and the same precautions used, as in the case of a recent death from diphtheria.

Yours truly,

R. J. FARQUHARSON,
Secretary.

OUTBREAK OF SMALL-POX.

STATE BOARD OF HEALTH OF MINNESOTA,
SECRETARY'S OFFICE,
RED WING, MINNESOTA, November 11, 1881.

DR. FARQUHARSON, *Secretary Iowa State Board of Health:*

Dear Sir—I am sorry to have to report that a patient directly from Bellevue, below Dubuque, came home to Hokah, Houston county, Minn. He states that he and others were taken sick; they went to a hospital; he was permitted to come home. He broke out the second day, and is now confluent. I visited the place last night and have arranged that no patient or contagion escape from us, and as was agreed at our conference last September, I send you official notice of the same.

Yours truly,

CHARLES N. HEWITT,
Secretary Minn. S. B. of H.

IOWA STATE BOARD OF HEALTH
OFFICE OF THE SECRETARY,
DES MOINES, November 14, 1881.

DR. CHARLES N. HEWITT, *Secretary Minn. S. B. of Health:*

Dear Doctor—Your kind favor of the 11th inst. came duly to hand. You have greatly the advantage of us in having your outbreaks of small-pox reported. Ours reach you as soon as they do this office, for we generally first hear of them by the Chicago papers. Small-pox is now at Clinton, Lyons, Dubuque, and Bellevue, and perhaps at some other places, yet we have had no official notice of its occurrence.

Yours truly,

R. J. FARQUHARSON.
Secretary.

COMPULSORY VACCINATION OF CHILDEN IN THE PUBLIC SCHOOLS.

LYONS, IOWA, March 21, 1881.

Dear Doctor—Our School Board has refused to issue an order compelling all children attending the public schools to be vaccinated, or submit evidence of proper protection from small-pox, claiming that there is no law for the same, and that they can resort to no compulsory measures in this respect.

Holding a different opinion, that the order should be issued as a sanitary and precautionary measure, I desire to obtain the decision of the State Board, and also the opinion of the Attorney-General upon this point, and I will have it published in our paper here.

If I am wrong, what action should be taken in the matter?

Yours truly,

CHARLES H. LATHROP.

IOWA STATE BOARD OF HEALTH,
OFFICE OF THE SECRETARY,
DES MOINES, November 22, 1881.

DR. CHARLES H. LATHROP, LYONS, IOWA:

Dear Doctor—Yours of the 21st came duly to hand. The functions of the State Board are simply advisory; it cannot decide questions of law.

School boards have the legal right to require previous vaccination as a condition to entering the schools, and such is already the practice in some places.

The local board of health has the authority to order the vaccination of all school children, and also the power to enforce this order.

Thus, under section 22 (chapter 151, Laws of 1880) according to the opinion of the Attorney-General of February 11, 1881, the local board has not only the right to order the vaccination of any one, but to prescribe the details of the process. The Attorney-General says: "I have no question at all, but that local boards of health have the power to regulate and determine how vaccination shall be done; and that the board may direct that all persons shall be vaccinated."

Yours truly,

R. J. FARQUHARSON,
Secretary.

TRANSPORTATION OF CORPSES THROUGH THE STATE.

CHICAGO, November 16, 1881.

R. J. FARQUHARSON, M. D., *Secretary Iowa State Board of Health, Des Moines, Iowa:*

Dear Sir—I saw not long since a copy of your rules for the transportation of corpses by railroads and steamboats, and a short time ago, while at the C., R. I. & P. R. R. depot here, noticed a corpse en route from somewhere on the Pacific Coast, which must necessarily have passed through Iowa. The person in charge had only a physician's certificate that death was not due to any infection or contagious disease. The body was well boxed, and in apparent good condition.

Now, I would like to know if the rules laid down by this State (that in addition to the certificates about contagious or infectious diseases, the shipping undertaker's certificate that the body has been prepared in *exact accordance with rules for shipment must also accompany the body*) can be made to apply to a corpse originating in another State and passing through this State to another State. With corpses originating in Iowa of course I understand that the local rules will hold good.

Again, there has been for a long time a rule strictly enforced by all transportation companies that under no circumstances will they receive a corpse from any other company or from an individual, unless there is a certificate that death was not caused by infection or contagious disease, presented by the person who is in charge of the corpse.

Does not this really cover such a case, and is it not sufficient where the corpse comes from another and goes through Iowa to another State?

Please answer on this and oblige.

Yours truly,

S. B. PARKER.

Care of McCorkle Bros., room 6, Portland Block, Chicago, Ill.

This letter was submitted to the President, with the following indorsement:

NOVEMBER 19, 1881.

Would it suffice to answer that our rules apply only to "corpses originating" in Iowa, and to those coming from abroad but destined for burial in this State?

Would not the rule spoken of as existing among transportation companies be sufficient protection in the cases of corpses passing through the State?

IOWA STATE BOARD OF HEALTH,
OFFICE OF THE PRESIDENT,
MUSCATINE, IOWA, November 23, 1881.

R. J. FARQUHARSON, *Secretary Iowa State Board of Health:*

Dear Doctor—The rules apply, according to my understanding, to bodies of persons dying ("originating") in Iowa. I have often intended raising the question propounded by Mr. Parker. I think when a corpse crosses our State it should be competent for any health officer, or officer having charge of such transportation, to require of the attendant, or the person shipping, a personal certificate as to the non-contagion of the disease causing death.

I think the rule now in existence among transportation companies protects our State from infectious diseases.

While on this subject, I think there should be a more vigorous effort made to enforce the rules on the subject. Undertakers do not strictly observe the rules; local health officers should look after the matter.

Very truly yours,

W. S. ROBERTSON,
President.

IOWA STATE BOARD OF HEALTH,
SECRETARY'S OFFICE,
DES MOINES, November 24, 1881.

S. B. PARKER, ESQ., *Room 6 Portland Block, Chicago:*

Dear Sir—Yours of the 16th instant came duly to hand, and was referred to the President.

Our rules only apply to the bodies of persons dying in Iowa. We consider the certificate of the non-contagious or non-infectious nature of the cause of death, as required by transportation companies, as sufficient protection,

while the body is in transit; but the local health officers at railroad stations will be instructed to see that bodies are accompanied by such a certificate.

Yours truly,

R. J. FARQUHARSON,
Secretary.

NEGLECT OF PHYSICIANS TO REPORT.

Dr. J. S. Lewis, health officer, Dubuque, complains of the failure of physicians to report deaths and also cases of diseases injurious to public health. Answered as follows:

The difficulties you speak of exist throughout the State. Nothing can be done, however, until all persons practicing medicine are compelled by law, under a sufficient penalty, to register themselves with the county clerks. Every city should only permit an interment upon a physician's certificate of death. This is the practice in Davenport, where also the principal cemeteries are out of town.

CHEESE-POISONING.

DAVENPORT, Iowa, December 27, 1881.

DR. R. J. FARQUHARSON, *Secretary Iowa State Board of Health:*

Dear Sir—Acting upon the advice of Dr. Middleton, I take the liberty of writing you, thinking that perhaps you can give us some light upon a subject in which many have an interest. About a week ago, one of our grocers cut a large fine cheese and sold a considerable quantity of it. Nearly all who partook thereof reported that it made them very sick. A sample was sent me with a request that I make an analysis of the same. Examined it under the microscope, but could detect nothing abnormal. All chemical tests applied to detect the presence of foreign matter (such as the symptoms it produced might indicate), were without success. One ounce of the cheese taken just before dinner produced intense vomiting and purging three and a half hours afterward. A few of those who partook of the cheese were not affected. We are greatly in the dark as to the cause of the trouble, and knowing that your experience and observation in this direction has been large, any information you might be able to give, as to this probable cause of trouble, would be very thankfully received by many interested.

Very truly yours,

FRANK NADLER.

Davenport, Iowa.

P. S.—I am informed that the cheese is from a creamery in New York.

IOWA STATE BOARD OF HEALTH,
OFFICE OF THE SECRETARY,
DES MOINES, December 29, 1881.

FRANK NADLER, ESQ., *Davenport, Iowa:*

Your kind favor of the twenty-seventh instant came duly to hand.

This is a case of the action of that apparently mysterious poison which is developed in the interior of cheese, blood-puddings, sausages, hogshead-

cheese, canned corn-beef, etc.; indeed, in the masses of any highly nitrogenized matter. It is the beginning of putrefaction, but with the exclusion of the oxygen of the air, it is not perceptible to the senses, though bacteria have (it is said) been detected in the washings of such affected substances, under the microscope. This poison has received the name of *Allanto-toxicon, i. e.*, sausage-poison; in German, *Wurstgift*.

This form of poisoning is not uncommon. Yesterday's papers contained an account of the poisoning of a whole family from eating hogshead-cheese, and last summer almost all of the inhabitants of a village in this State were poisoned by eating of a freshly cut cheese. The best preventive in the case of sausages, hogshead-cheese, blood-puddings, and all that kind, is a thorough boiling until they creak under pressure. Of course, in the case of cheese, this preventive cannot be applied, nor is any effective one known. Happily, the mortality from this species of poisoning is not large, and the treatment simple, consisting in the use of emetcis (if early enough), then of anodynes and stimulants. Yours truly,

R. J. FARQUHARSON,
Secretary.

VACCINATION OF RAILROAD EMPOYES.

CHICAGO, ROCK ISLAND & PACIFIC R'Y.,
OFFICE OF SURGEON-IN-CHIEF,
DAVENPORT, IOWA, December 30, 1881.

To all employes—Since the Boards of Health of the different States, in which the lines of this road are located, believe that small-pox is interrupting travel, and otherwise prejudicing the health and lives of the citizens, and that immunity from the disease may be enjoyed, it is deemed best for all railway employes to be vaccinated.

You will, therefore, within thirty days from the date of this order, be vaccinated.

In those cases were vaccination has been performed, but not within one year, re-vaccination is required.

All officers in charge of men will see that this requirement is strictly enforced, and any refusal to comply with its provision must at once be reported to the General Superintendent.

A. KIMBALL,
General Superintendent.
R. H. CHAMBERLAIN,
Division Superintendent.
W. F. PECK,
Surgeon-in-Chief.

I have issued the above order on *all* divisions of the road.

W. F. PECK.

POWER OF A LOCAL BOARD OF HEALTH TO ENFORCE VACCINATION.

FAYETTE, FAYETTE CO., December 30, 1881.

Dear Sir—Have we the authority as a local board of health to enforce vaccination?

We have passed an ordinance to that effect, as we have variola near us.

Please answer at once.

M. Y. BAKER,
Health Physician.

IOWA STATE BOARD OF HEALTH,
SECRETARY'S OFFICE,
DES MOINES, January 2, 1882.

DR. M. Y. BAKER, *Health Officer, Fayette, Fayette Co:*

Dear Doctor—Yours of the 30th ult. came duly to hand.

The local board of health has the authority to enforce any general rules in regard to vaccination, as they have any other sanitary measure.

In answer to a similar question from Clinton county it was replied that:

"The local board of health has the authority to order the vaccination of all school children, and also the power to enforce this order.

"Thus, under section 22 (chapter 151, Laws of 1880) according to the opinion of the Attorney-General of February 8, 1881, the local board has not only the right to order the vaccination of any one, but to prescribe the details of the process."

The last sentence of section 22 is sufficiently general to include almost any exercise of power on the part of the local board, "and may take such other measures as may be deemed necessary for the safety of the inhabitants."

Yours truly,
R. J. FARQUHARSON.
Secretray.

PROPER LOCATION OF A PEST-HOUSE.

OTTUMWA, January 18, 1882.

PROF. W. F. PECK, *Davenport, Iowa:*

Dear Sir—Our city board of health are taking steps to locate a pest-house for the care of small-pox patients, and desiring to act prudently in the matter I address you the following question, which I will be much obliged to have you answer at as early a day as may be convenient to you.

(1.) "At what distance is it reasonably probable that small-pox will be communicated through the atmosphere?"

(2.) "Within what distance of an inhabited dwelling would you regard it unsafe to locate and use a house in which to place and treat small-pox patients?"

Of course these inquiries are based on the theory that such house will be properly kept. I now address you at the instance of our mutual friend, Dr. E. L. Lathrop, of this city.

Yours truly,

H. B. HENDERSHOTT.

OFFICE OF DR. W. F. PECK.
DAVENPORT, IOWA, January 19, 1882.

DR. R. J. FARQUHARSON, *Secretary Iowa State Board of Health, Des Moines:*

Dear Doctor—You reply to this letter, and give Hendershott the information solicited.

Yours truly,

W. F. PECK.

IOWA STATE BOARD OF HEALTH,
OFFICE OF THE SECRETARY.
DES MOINES, January 20, 1882.

H. B. HENDERSHOTT, ESQ., *Ottumwa, Iowa:*

Dear Sir—Yours of the 18th inst. was sent to me by Dr. Peck, with a request that I answer your questions.

1. "At what distance is it reasonably probable that small-pox will be communicated through the atmosphere?"

This question cannot be definitely answered, but my opinion is, that most cases reported as infected through the air at long distances, will prove on thorough investigation to have been by contact (contagion); as in the case of small-pox in one of the crew of the United States ship Pensacola, lying off Callao, South America, who had not been ashore for months, and where at first the mysterious germs seemed to have been borne in the wind from the city, where small-pox was raging. Further investigation showed however, that in all probability the contagion came from the paper money given by the bumboat man to the sailor.—*Report of Sur.-Gen'l U. S. Navy for 1879.*

2. "Within what distance of an inhabited dwelling would you regard it unsafe to locate and use a house in which to place and treat small pox patients?"

As Judge Burton's recently delivered opinion has the following: "But there is evidence of its having been carried across a river 1,500 feet wide," it would be evidently unsafe for you to locate your hospital within that distance of any inhabited house. In Scott county this same difficult problem was effectually solved by placing the pest-house in the grounds of Mercy Hospital and under the charge of the Sisters of that institution.

Yours truly,

R. J. FARQUHARSON,
Secretary.

COMPENSATION FOR MAKING RETURNS.

The following letter is from Dr. Elisha Harris, Secretary of New York State Board of Health, in answer to one of inquiry:

STATE BOARD OF HEALTH OF NEW YORK.
ALBANY, January 31, 1882.

TO R. J. FARQUHARSON, M. D., *Secretary Iowa State Board of Health:*

Dear Doctor—This mail takes to you the forms asked, and other printed matter. As New York is the *entrepot* for the old world's migrants and their contagia, we have a life of sanitary vigilance that no other State was ever subjected to; yet our people accept vaccination without demurring, and they are becoming so well protected thereby that our sympathy goes out beyond State boundaries, wherever the contagion of variola is carried. You inquire "What pay do the registering clerks get for the recording of births, deaths, and marriages"?

Answer: Yes. The new statute authorizes fifty cents to be voted and paid by the town, village, or city that pleases to pay for such work. The recording clerk actually receives only from fifteen to twenty-five cents, and the school district clerk, or other local *watcher* and *reporter* in the primary community, gets nearly or quite as much for every record he brings in; yet physicians and clergymen do send a larger share of the attested certificates to the recording clerk without pay.

You also ask if physicians get any pay for certifying? Answer: No. Yet the county of Tompkins voted twenty-five cents for every medical or ecclesiastical return,—with the result, that the returns are withheld that would have been made cheerfully to the town clerk or health officer without pay.

We shall request the supervisors of that county to relegate the whole matter to the town board of health, and let it arrange for compensating only the persons they must hold to their duty for pay: namely, school district clerks and employed persons.

It can be voted a misdemeanor for a physician or other person to disregard a regulation of the local board. Please notice:—In the State of New York we have made the *perfectness* and *simplicity* of form of each kind of return the first conditionary success. The responsible householder, friend, or caretaker becomes responsible for the record of each death. The medical attendant certifies what he must. The second element of success is the treatment of each record as being so important that it must be brought to the registering clerk within three days.

Yours truly,

ELISHA HARRIS, *Secretary.*

PREVALENCE OF SMALL-POX IN IOWA.

NATIONAL BOARD OF HEALTH,
WASHINGTON, D. C., Feb. 6, 1881.

DR. R. J. FARQUHARSON, *Secretary Iowa State Board of Health:*

Sir—For the purpose of determining how far the prevalence of small-pox in the several States is due to the introduction of the disease into the United States from other countries, or from one State into another, and what measures would most effectually prevent its introduction from other countries and spread from one State into another, the following inquiries are respectfully submitted for your consideration. An early reply is requested.

1. To what extent does small-pox prevail in your State?
2. Have the first cases been brought into your State from places beyond the State limits; if so, from what place or places?
3. Through what lines of travel, or traffic, does the infection or contagion enter your State?
4. What measures, if any, would you suggest to prevent the introduction of small-pox into your State, and from your State into another?

Respectfully,

T. J. TURNER,
Secretary National Board of Health.

IOWA STATE BOARD OF HEALTH,
OFFICE OF THE SECRETARY,
DES MOINES, February 16, 1882.

DR. T. J. TURNER, *Secretary National Board of Health:*

Dear Sir—Yours of the sixth instant came duly to hand. Before attempting to answer the questions in that communication, I would beg leave to make the following explanation:

According to the present law the Iowa State Board of Health has only advisory powers, and health officers and others are neglectful and indifferent about reporting cases of small-pox, knowing that the only assistance we can render is to send circulars, etc.

1. Since early last spring (1881), scattering cases of small-pox have been reported from various parts of the State, but only at three points has it spread to any extent. These points are (1) Bellevue, Jackson county; (2) Keokuk, Lee county, and (3) Clayton and Delaware counties.

At Bellevue the infection was stated to be from Chicago, and was checked after causing a few deaths, and a score or more of cases.

At Keokuk the outbreak occurred among the students of the medical college, who were said to have been infected from a cadaver from Chicago. The foolish and unfortunate dispersion of the students carried the disease to many points, which were mostly in the State of Illinois. The disease is said to no longer prevail at Keokuk, no new cases now occurring.

As to the third point (Clayton and Delaware counties), I am just now in receipt of information that small-pox is spread over a considerable portion

of these two counties. The origin of the disease is not stated, but it appears to have been prevailing since last summer, having been considered at its origin as chicken or swine-pox. Being then of a very mild form and no deaths occurring, no quarantine or other preventive measures were resorted to, hence the spread of it over the large space now occupied. My informant adds that now confluent and hemorrhagic cases are beginning to appear.

All the points of outbreak above mentioned are in the counties on the Mississippi river, and in all probability the primary source of contagion was from emigrants passing through Chicago.

2. The answer to this is contained in that to question 1.

3. By the following east and west railroads from Chicago across the State, *viz.:* Illinois Central; Chicago, Milwaukee & St. Paul; Chicago & Northwestern; Chicago, Rock Island & Pacific; Chicago, Burlington & Quincy, and the Wabash.

4. I can only suggest as a remedy such a perfect and thorough examination and quarantine of emigrants at the various sea and lake ports of entry, as is only possible in the hands of the National Government, where, I have always thought, is the proper place for the whole external quarantine of the United States.

Yours truly,

R. J. FARQUHARSON,
Secretary.

TRICHINÆ AND TRICHINOSCOPE.

RED WING, MINN., February 13, 1882.

R. J. FARQUHARSON, M. D., *Secretary Iowa State Board of Health:*

Dear Doctor—I send you a section of the posterior column of the diaphragm of our last victim of trichinosis. You can get the "trichinoscope" we saw at Savannah of the Beusch & Lamb Optical Company, Rochester, N. Y. Price, $3.

We have, perhaps, half a dozen cases of variola in the localities where it has been epidemic. In Hoka, Houston county, near your State, it is thoroughly quarantined, though by fair rights we ought to have sent it back to you whence the outbreak came.

Yours truly,

CHAS. N. HEWITT,
Secretary.

SMALL-POX IN DELAWARE AND CLAYTON COUNTIES.

STRAWBERRY POINT, IOWA.

DR. FARQUHARSON, *Secretary Iowa State Board of Health:*

Dear Doctor—Last summer there appeared an infectious and contagious disease in Elk township, Delaware county. Said disease was denominated by some of our physicians to be swine-pox; by others, familiar with small-pox, to be small-pox but mild. In nineteen cases out of twenty-three the

subjects were from sixteen to seventy-six years old, and many of them were known to have had the chicken-pox. The disease continued to spread until it is now raging in Delaware, Fayette, and Clayton counties, for want of quarantine. It assumes every degree of intensity, to the confluent variety, and hemorrhagic cases are beginning to appear. At a meeting of the Medical Society of Delaware county, on the 7th ult., the Society appointed a committee to investigate said disease and report the same. The committee have made their investigation and pronounced said epidemic to be small-pox.

While we were investigating the disease in Elk township, Clayton county, a citizen informed us of the fact that there were one hundred and fifty cases in said township and no restraint whatever was being exercised in the cases, the whole people at large spreading the scourge. The local boards of health wholly refuse to quarantine, and I ask you for a special order that will cause the townships of Elk and Honey Creek in Delaware county, Elk and Lodomillo townships in Clayton county, to quarantine their cases, and force them to comply with the rules and regulations of the State Board of Health; for those that have had it are going about with scabs on their persons, without any purifying process whatever having been used.

If you will send an order, as you deem best, then in case we are forced to call for a writ of *mandamus*, we can attach your order to our petition, which will enable us to obtain said writ without trouble or delay.

Fraternally,

H. NEWELL SILL, M. D.

IOWA STATE BOARD OF HEALTH,
OFFICE OF THE SECRETARY,
February 13, 1882.

H. NEWELL SILL, M. D., *Strawberry Point, Iowa:*

Dear Doctor—Your kind favor of the 11th inst. came duly to hand.

The State Board of Health has no executive powers, and can only act through the local boards. When they refuse or neglect to do their duty, it is powerless.

To-day are sent marked copies of circular on small-pox, and of the opinions of the Attorney General. It will be seen that he considers section 13, chapter 151, laws of 1880, mandatory, and therefore that local boards may be forced to do their duty; and if they refuse, they are liable to an indictment for a misdemeanor.

Yours truly,

R. J. FARQUHARSON,
Secretary.

CIRCULAR LETTER TO IOWA CONGRESSMEN.

IOWA STATE BOARD OF HEALTH,
OFFICE OF THE SECRETARY,
DES MOINES, February 21, 1882.

To the Honorable ———:

Dear Sir—Believing that the only certain protection to Iowa and other interior States, from the introduction of small-pox and other contagious diseases, consists of an examination and quarantine of immigrants at the sea and lake ports of entry, and also that such can only be had by a National Quarantine in the hands of national officers of health; the Iowa State Board of Health would therefore respectfully but urgently ask the senators and representatives of Iowa, in Congress, to secure if possible, the necessary legislation to this end.

Very respectfully, your obedient servants,

W. S. ROBERTSON,
President.

R. J. FARQUHARSON,
Secretary.

RESOLUTIONS OF MICHIGAN BOARD OF HEALTH UPON SMALL-POX AND YELLOW FEVER, MARCH 1, 1882.

At a special meeting of the Michigan State Board of Health, held at Ann Arbor, March 1, 1882, the following preamble and resolutions were adopted:

WHEREAS, Measures for the prevention of the introduction of diseases from foreign countries into the United States, are of national importance, affecting not only the seaboard and Gulf States, but also States in the interior, as evidenced a few years since by the wide spread disaster from yellow fever, and recently by the wide diffusion of imported small-pox; therefore,

Resolved, That in the judgment of this board, such measures should be continued by the National Board of Health, and undertaken by the United States Government, as will best and most effectually prevent the introduction of diseases into the United States.

Resolved, That our Senators and Representatives in Congress be, and they hereby are, respectfully and earnestly requested to use their influence toward securing any appropriate legislation which may be necessary to this end.

At a special meeting of the Michigan State Board of Health, held at Ann Arbor, March 1, 1882, the following preamble and resolutions were adopted:

WHEREAS, The prevention of the introduction of yellow fever into the United States, is a subject of national importance;

Resolved, That in the opinion of this board it is proper for the Louisiana Board of Health to ask, and it is the duty of the National Board of Health to continue to give, aid in the prevention of the introduction of yellow fever into the Mississippi Valley.

Resolved, That, because of the duties of the National Board of Health in aiding the prevention of the introduction of yellow fever and in giving

accurate information to all States interested in the sanitary condition of the Mississippi Valley, 1. An Inspector of the National Board of Health should be placed at Eadsport, to act conjointly with the officer of the State Board of Health in securing the exclusion of infected vessels from the Mississippi river, and in notifying such vessels that they must be thoroughly disinfected. 2. That a representative of the National Board of Health should be stationed at the Mississippi River Quarantine Station. 3. That it is the duty of all health authorities in Louisiana, and in the Gulf States, promptly to communicate to the National Board of Health any and all possible information relative to the occurrence of yellow fever, or of a case which may be suspected to be yellow fever, and in every possible way to aid the National Board of Health to perform its duties in giving accurate information for the guidance of State and other boards of health throughout this country.

IMMIGRANT INSPECTION SERVICE.

NATIONAL BOARD OF HEALTH,
31 WEST 42D ST., NEW YORK,
March 3, 1882.

DR. R. J. FARQUHARSON, *Secretary Iowa State Board of Health, Des Moines, Iowa:*

Dear Doctor—The National Board is considering the question of undertaking a system of railroad inspection of immigrants with a view to secure the vaccination of the unprotected and eliminate those suffering from smallpox.

There is promise of a third more, perhaps a half, possibly twice the number this year. Steamship companies are doubling their carrying capacity.

The system proposed is this: the emigrants must all be examined, if possible, before embarking, and tickets given them; if protected the person receives a white card with name and date of vaccination; if unprotected he is vaccinated and a red card given with name and date of vaccination; if he refuse examination he will have no card, and is a suspicious person. If then, at certain intervals of the great railroad lines, inspectors board the train and demand the tickets, they will at once detect the true condition of each immigrant.

The trains need not be delayed for the inspection may go on while the train is moving. The matter has been referred to me by the Board, and this an outline of the plan that seems to me practicable. I wish to ask you two questions:

I. What do you think of it?

II. Is there any point in your State where such inspection is necessary?

Yours truly,

STEPHEN SMITH.

IOWA STATE BOARD OF HEALTH,
OFFICE OF THE SECRETARY.
DES MOINES, March 7, 1882.

DR. STEPHEN SMITH, *National Board of Health, 31 West 42d St., New York:*

Dear Doctor:—Your kind favor of the 3d inst. came duly to hand.

As to the system proposed I would beg leave to answer the questions as follows, viz.:

1. If a proper examination of European immigrants was made at the points of embarkation, and the unprotected ones properly vaccinated, and if this process was again repeated at the ports of entry into this country, there would be but little need of any inspection afterward on the railroads.

2. Nearly, if not, all of our immigrants reach Iowa through Chicago, so that if railroad inspection was necessary, and was properly performed east of that city, nothing further in the way of inspection would be needed for our protection.

If, however, inspection west of Chicago was thought necessary for our protection, it would have to take place on the following railroads, viz.: Chicago, Milwaukee & St. Paul; Illinois Central; Chicago & Northwestern; Chicago, Rock Island & Pacific; Chicago, Burlington & Quincy; and the Wabash, which enter the State by crossing the Mississippi river, at McGregor, Sabula, Dubuque, Clinton, Davenport, Burlington and Keokuk.

Yours truly,

R. J. FARQUHARSON,
Secretary.

NATIONAL BOARD OF HEALTH,
31 WEST 42D ST., NEW YORK.
March 11, 1882.

DR. H. J. FARQUHARSON, *Secretary Iowa State Board of Health:*

My dear Doctor—Yours of the 7th inst. is received. Your suggestion is the one that the National Board has been acting upon, but in every attempt it has failed owing to defects in the law. It cannot enforce vaccination, either at foreign or home ports under existing laws, and inspection seems to be the only alternative.

I have just returned from Washington, where the Board had a meeting for the purpose of determining what, under the circumstances, it was best to do.

Hitherto, it has seemed impossible to secure the required legislation, but while in Washington we met a large number of members of Congress, and explained to them the difficulties under which we labor in attempting to enforce vaccination.

A delegation was also present from Chicago urging immediate action. The result of our consultations seems most favorable to immediate legislation.

We called upon the President, and on representing the facts to him, he decided to send a special message to Congress calling its attention to the necessity of immediately perfecting the law. If the law is amended in the

particulars we desire and propose, we can apparently compel the vaccination of every incoming immigrant for all time, and thus protect the country from small-pox.

Now, I think you could aid the movement very much if your Board would pass resolutions urging your representatives in Congress to take immediate steps to secure such legislation as will effectually prevent the introduction of small-pox from foreign countries into the United States, and to that end the vaccination of all unprotected immigrants, and send such resolutions to each member. In addition, can you not have all the members of your State Board and others to write individual letters to the members?

With proper effort, aided by the President, we may get such a law in a few weeks, and in time to effect the vaccination of the immense mass of immigrants which now threatens us.

Yours truly,

STEPHEN SMITH.

IOWA STATE BOARD OF HEALTH,
OFFICE OF THE SECRETARY,
DES MOINES, March 14, 1882.

DR. STEPHEN SMITH, *National Board of Health, 31 West 42d Street, New York:*

Dear Doctor—Your kind favor of the 11th inst. came duly to hand.

It is almost impossible to get our Board together except at the regular meetings. In consequence, the President and myself are in the habit of expressing the views of the Board in public matters.

Soon after the receipt of a copy of the resolutions on the subject passed by the Illinois State Board in January, I drafted a circular letter expressing the wishes of our Board, a copy of which signed by Dr. Robertson and myself was in the hands of each Senator and member for this State before the 1st of March. I have no doubt but that they will all vote for, and otherwise sustain the measure mentioned in your letter.

Yours truly,

R. J. FARQUHARSON,
Secretray.

OVERFLOWS OF THE MISSISSIPPI RIVER.

TENNESSEE STATE BOARD OF HEALTH,
NASHVILLE, April 7, 1882.

Dear Sir—At the regular April term of the State Board of Health of Tennessee, the following resolutions were adopted:

WHEREAS, The periodic overflows of the Mississippi river are not alone destructive to the materal interest of the section, to the extent of millions annually, but are in a pre-eminent degree disastrous to the health and lives of the people of the Great Valley, liberating continually noxious gases which in effect are annually consigning thousands to premature graves, and at the same time placing the health of the whole people upon a lower plane

than it would otherwise occupy, diminishing thereby their power of resistance to disease, and as a consequence enabling epidemics to multiply their victims; therefore, be it

Resolved, That the State Board of Health of Tennessee do respectfully petition Congress, and urge upon our Senators and Representatives in Congress, to exhaust every means to secure the speedy inauguration of plans by the General Government which, when completed, shall for all coming time effectually prevent the repetition of the sad experience of the past.

Resolved, That the Secretary be instructed to transmit a copy of these resolutions to such Senators and Representatives in Congress, also to each State Board of Health in the Valley of the Mississippi river.

Respectfully yours,

W. M. CLARK, M. D.,
Secretary State Board of Health of Tennessee.

SANITARY SUBJECTS.

The following sanitary subjects now occupy the attention of the National Board of Health, and are of interest to the people of Iowa:

1. The gratuitous or cheap supply of pure vaccine virus.

A bill for this purpose has been introduced into Congress, at the present session, and as it is undoubtedly a popular measure, it bids fair to become a law.

By direction of the National Board, Dr. James Law, the distinguished veterinary surgeon, has examined some of the principal vaccine farms in New York, New Jersey and Pennsylvania, the result of his observations being published in a recent bulletin of the National Board of Health.

There is no doubt that by using bovine lymph there is complete immunity from syphillis; but, according to Dr. Law there is a possibility of the communication of the following diseases, viz.: "*Simple, infecting inflammation, erysipelas, septic infection, malignant pustule, epizootic eczema, and perhaps tuberculosis.*"

Dr. Law says: "*The frequent occurrence of erysipelas around the seat of inoculation with bovine virus is a fact too notorious to be denied.*"

On the other hand, Dr. Martin, who introduced the Beaugency stock of virus into this country, declares that no instance of erysipelas occurred among many thousands of inoculations made by himself; indeed, he goes so far as to assert that the inoculation is a preventive of that disease. To avoid simple infecting inflammation, erysipelas, and septic infection, he advises the use of quill points alone; the taking of the lymph at an earlier period than the present mode (*i. e.*,

the seventh or eighth day); the use of old calves or those past weaning; and lastly, in order to avoid the soiling of the vaccinated spots with urine or fæces, or the friction of the cloth now used to prevent this, that the inoculation should be practiced on the back of the calf.

Epizootic eczema, or the foot and mouth disease, having a very short period of incubation (two days), and, like the cow-pox, affecting the udder and the insides of the thighs, Dr. Law considers a very dangerous affection, but fortunately does not exist in the United States at present. Dr. Law would avoid the possibility of communicating malignant pustule, which would result from the use of the lymph of a calf affected with anthrax, by placing vaccine farms in high and dry spots, upon an open or gravelly soil, away from all marshes, ponds, etc., which are known to favor attacks of that disease.

Dr. Law states that though tuberculosis has never yet been propagated in the human subject from the inoculation of bovine lymph, such an event is possible, for it is a well known fact that it can be transmitted from animal to animal by inoculation. To avoid this danger, he advises to quit the present practice of using "*picked-up*" calves, and instead to breed them for the purpose; also to avoid the Jersey race of cattle, which are now selected for the purpose, on account of the delicacy of their skins, but which, according to the experience of Dr. Law, are "*more subject to consumption than any other race of cattle in America; * * * in many herds one half having become victims of tuberculosis.*"

The establishment of some central depot for the propagation and dissemination of pure cow-pox, under the management of the National Board of Health, would be of almost inestimable value to the whole country.

The prevention of the admission of small-pox and other contagious and infectious diseases to this from foreign countries, is a subject which has occupied the attention of the National Board of Health for some time past, and is also of great interest to the public in general. It is obvious to all thoughtful persons, more especially to those living inland, that there is somewhere a very great defect in the operation of the external quarantine system, especially as now by law placed in the hands of, and operated exclusively by local authorities, which local authorities are all more or less swayed by local influences and prejudices, mostly of a commercial nature. Another difficulty in

the proper execution of quarantine laws by a State is on the score of expense. If the State of New York had to bear the expenses incidental to the proper examination and perhaps detention of the vast number of immigrants arriving in the port of New York, it would amount to a grevious tax and be a very unjust one, for the great majority of immigrants, all the hale, hearty, active, well to do ones pass through to the inland States, New York getting the worst of the lot, the dregs as it were. It being held by recent decisions of the United States courts that no State can levy a tax of head money, or any other upon persons coming to this country, it remains either to let the matter of external quarantine pass into the hands of the general government, where it naturally, though not legally, belongs, which can both tax and collect whatever is needed, or without a special tax, can bear the cost, as it is for the good of the whole people, or at least of that large number of inland States securing the valuable acquisition of foreign emigration, or to let the matter rest as at present, thus filling the country every year with small-pox and other contagious or infectious diseases.

A plan which has the approval of the National Board of Health and of many other experienced sanitarians is to require the vaccination of all unprotected emigrants at their points of embarkation in Europe. In accordance with the expressed views of the small-pox conference of June, 1881, the President of the United States in November, 1881, approved the following rule, which is now in force:

"That all persons coming from or through any port or place, *in which small-pox exists*, who, after the 14th day of November, 1881, shall arrive at any port of entry within the United States, shall be subjected to examinations as regards their protection from that disease, by the proper health officers of the State within which such port lies, *or in case such authorities shall fail or refuse to enforce this rule, then by some officer or other person, to be designated by the President of the United States.*"

It is proposed now to strike out the words "*in which small-pox exists*," and the remainder of the rule would require the examination, and detention, if necessary, of all immigrants.

This whole matter is now in the hands of the present Congress, and as you will have seen by the circular letter already read, our Senators and Representatives have been requested to give all possible aid to the legislation necessary to carry it out.

Another subject occupying the attention of the National Board is that of collecting vital statistics by the United States, or rather the assistance of the several States in the collection of vital statistics, according to an uniform plan, and upon forms furnished by the United States.

VITAL STATISTICS.

As you are aware, much valuable matter in the way of vital statistics was collected by the census of 1880, which, when published, will be of great importance to the various State Boards of Health, life insurance companies, and the public generally. Though it is proposed to collect something similar, though in a less degree at the intervening quinquennial periods by the States, yet something annual is needed. At the last meeting of the American Public Health Association, held in Savannah, November, 1881, there were passed the following preamble and resolutions relating to completeness and uniformity of records, births, and marriages, and concerning co-ordination of efforts and laws to secure the result:

WHEREAS, The American Public Health Association, recognizing the fact that a correct knowledge and use of vital statistics, and especially of the records of mortality and disease are essential to the science and duties of public hygiene; therefore,

Resolved, That this Association fully concurs in the recommendations which have been made at several sessions of the American Association for the Advancement of Science, and at successive annual meetings of the American Public Health Association.

Resolved, That the report and papers herewith submitted from the committee on vital statistics be referred to said committee to revise and suitably present to the Forty-seventh Congress, at an early period of the session.

Resolved, That the National Board of Health is hereby requested to co-operate and lead in the effort to secure uniform results in registration of births, deaths, and marriages throughout the nation; and that said Board is earnestly requested to procure such action of the National Congress, and the adoption of such methods and regulations in all departments of the military, naval, and civil service as should be enforced by national laws and regulations.

Resolved, That accurate and faithful registration of deaths, and the causes of death, should be enforced in every State and Territory, under suitable statutes by local and State boards of health, or at least under the immediate supervision of such boards.

Resolved, That by whatever methods the most complete and perfect registration may be secured in the respective States, the results of such registration should present the vital statistics of the people complete and readily

comparable under each and all branches, that such uniformity of results may constitute the uniformity of system which this Association asks for in the name of the States and of the nation.

Resolved, That the several State boards of health are respectfully urged to do whatever they can to promote the completeness and uniformity in vital statistics of the respective States, and that, in order to promote their effectual co-operation, copies of this report be placed in the hands of each of the State boards of health, and also to be transmitted to each of the Governors of the States and Territories.

Resolved, That the American Health Association's committee on registration and vital statistics is hereby directed to continue its duties under the Association, and to co-operate with the National Board of Health as opportunity is afforded to promote the desired action of the State and National Legislatures, and of the boards of health.

This project, for a uniform registration of vital statistics, beside the approval of the above named bodies, viz: the American Association for the Advancement of Science, the American Public Health Association, and the National Board of Health, has also the sanction of the American Academy of Science, the American Meteorological Society, and the American Medical Association.

In a late number (p. 33, vol. 3) of the National Board of Health Bulletin, Dr. Billings, U. S. A., chairman of the committee on vital statistics, makes a report, the nature of which is shown by the following extracts:

"The population in Massachusetts in 1880 was 1,783,085. Number of births registered, 44,217; number of deaths, 35,292; number of marriages 15,538.

The cost of this registration, including the publication of the annual registration report, is about $39,500, being at the rate of about $22 per thousand of population, and this may probably be taken as a fair average for a State having the same relative density of population as Massachusetts. * * * * * * The amount paid by the State for compilation and publication amounts to about $4,500.

* * * * * * The United States as a government does not desire to be in possession of the details of registration. What it needs are the results, compiled and presented in a certain way upon certain forms, as is done to the Registrar-General of England, while the individual items are needed in the locality where they have been recorded for judicial and other purposes."

* * * * To carry out this plan it will be necessary that the reports furnished to the United States Government from the State registering authorities, and to be paid for, shall be not only according to the forms to be prescribed by the United States, but shall possess a sufficient degree of completeness and accuracy to warrant their use for sanitary and statistical purposes. It is also evident that the department of the Government charged

with the recording, compiling, and publishing these statistics m charged with the duty and power of deciding whether they are sufficiently complete to warrant payment therefor.

According to the present census law the United States will pay one half of the expenses of a State census in 1885; "provided that the blank schedules used for the purposes of enumeration herein provided for shall be similar, in all respects of form and size of binding and ruling, to those in the census of the United States."

"How much should the General government pay to a State fo complete returns of its births, deaths, and marrirges as would be desirable?" Suppose we fix this at $2,500 per million of inhabitants, and see how the matter would stand on this estimate. For the present population of a little over 50,000,000 the annual cost would be about $125,000. It is certain, however, that it will be a long while before all the States and Territories would have passed the necessary laws to enable them to join in this movement.

At the present time the General Government would probably not be called upon to pay for more than 10,000,000 of population, that is $25,000 per annum, certainly not an unreasonable amount. Would this amount be sufficient to induce the States to furnish the returns desired?

In those States which now have, or soon will have, moderately complete returns, * * * * * I think it would; for it would certainly cover one half of the expense of compilation and publication, while not increasing the cost to the state in any such proportion.

The plan, then, virtually is for the United States to pay one half of the cost of collecting and publishing the statistics of the State, which, from an estimate computed from the cost in Massachusetts, would be at the rate of $2,500 for each million of inhabitants.

NOMENCLATURE OF DISEASES.

Another, and a cognate matter, considered by Dr. Billings in his late report, is that of the Nomenclature of Diseases, more especially of those which are commonly the cause of death. As chairman of a committee on that subject he presented a "list of diseases reported as causes of death adopted in new forms of the registering wards of England." This list was prepared by Dr. Ogle, who is medical officer of the Registrar-General's office, and it will be used from this time henceforth in that office. Dr. Ogle is also a member of the committee of revision of the College of Physicians, and his list is believed to be in essential accord with the decisions of that body. It may be said to be substantially so, so far as the division of general diseases is concerned, which is the most important and at the same time the most difficult matter of classification in this regard.

Dr. Billings adds: "It will be found well suited to its purpose in the publication of report of vital statistics by State and municipal authorities pending the appearance of the revised nomenclature of the College of Physicians."

SMALL-POX IN IOWA.

Since the first outbreak of this disease diligent effort has been made to keep the State Board of Health advised of the different cases, their origin, history, etc. But all efforts have been in vain. Health officers, even when solicited by letter, in most cases declining or neglecting to answer. From other sources, mostly from the Chicago papers, I have learned of the presence of the disease in seventeen counties, which are marked on the accompanying map. Some means should be adopted to remedy, if possible, this defect, for certainly the State Board of Iowa should be as able to keep itself informed of the progress of small-pox, or of any other disease dangerous to public health, as that of Illinois, where they have not nearly so great an organization of local boards as in this State.

SANITARY COUNCIL OF THE MISSISSIPPI VALLEY.

By direction of the President I attended the meeting of this body, which was held at Cairo, Illinois, on the 19th of April. The council is composed of gentlemen representing most of the States of the Mississippi Valley (at least of those having State Boards of Health) and many of the towns and cities. It had its origin a few years ago in the yellow fever excitement, and has done some good work in guarding the mouth of the Mississippi river, which office or function belongs as much to the State Boards of Health of the different States composing the valley as to that of the State of Louisiana, in which hands the present laws, and the accidental situation of that State at the mouth of the river, places it.

From the extreme states rights notions held by the present President and members of the State Board of Health of Louisiana, this board has attempted at various times to arrogate to itself the exclusive jurisdiction in the matter of the quarantine of the mouth of the Mississippi river, and would have crippled, if not entirely nullified the action of the National Board of Health.

In this opposition Louisiana has not had the sanction or support of any other State, nor even of the Auxiliary Sanitary Association, or

the Chamber of Commerce of the city of New Orleans, under the pressure of public opinion outside of that State. The Louisiana Board has yielded so far as to allow an inspector of the National Board to remain in New Orleans, who can attend the meetings and consult the records of the State Board; but it yet refuses to comply with the wishes of the National Board by making use of the quarantine station at Ship Island, built and purchased by the United States, but continues to allow all ships, whether infected or not, to enter the Mississippi river, and ascend to the State Quarantine Station, which is above Port Eads, and dangerous to public health from its too great vicinity to the city of New Orleans, whence yellow fever has been propagated in one instance, though it is but fair to add that this is denied by the Louisiana State Board.

At the meeting the old question was again discussed and the following resolutions passed:

WHEREAS, The prevention of the introduction of yellow fever into the United States is a subject of national importance; and

WHEREAS, We believe that there is no safety if an infected vessel is allowed to enter the Mississippi river:

Resolved, That in the opinion of this council it is proper for the Louisiana Board of Health to ask, and it is the duty of the National Board of Health to continue to give, aid in the prevention of the introduction of yellow fever into the Mississippi Valley.

Resolved, That because of the duties of the National Board of Health in aiding the prevention of the introduction of yellow fever and in giving accurate information to all States interested in the sanitary condition of the Mississippi Valley.

(1.) An inspector of the National Board of Health should be placed at Eadsport to act conjointly with the officer of the State Board of Health in securing the exclusion of infected vessels from the Mississippi river, and in notifying such vessels that they must be thoroughly disinfected. (2.) That a representative of the National Board of Health should be stationed at the Mississippi river quarantine station. (3.) That it is the duty of all health authorities in the Gulf States promptly to communicate to the National Board of Health any and all possible information realtive to the occurrence of yellow fever, or of a case which may be suspected to be yellow fever, and in every possible way to aid the National Board of Health to perform its duties in giving accurate information for the guidance of State and other boards of health throughout this country.

Resolved, That this council, duly appreciating the utility of an efficient inspection service during the summer months for the Mississippi river and for railroads having their termini on the Gulf Coast, and also the efficiency and moral effect of such service as was maintained by the National Board of Health during the past three summers, do now respectfully request the

National Board of Health to re-establish said inspection service in the Mississippi Valley for the approaching summer, that is to say, until the middle of October.

Resolved, That the National Board of Health be requested to place on duty at New Orleans, and such other southern ports as may be deemed necessary, an inspector or inspectors, whose duties shall be to supervise the shipment by river or rail of all goods, merchandise, baggage, etc., and to inspect persons when necessary, and to advise by telegram the secretary of each board of health interested in the matter whenever such goods or persons are believed to be infected or in anywise dangerous to the public health.

Resolved, That the secretary of this council be instructed to transmit to the secretary of the National Board of Health a list of the health organizations forming this council.

Concerning maritime quarantines the committee offered the following which was also unanimously adopted:

WHEREAS, Measures for the prevention of the introduction of disease from foreign countries into the United States are of national importance, affecting not only the seaboard and gulf States, but also the interior, as evidenced a few years ago by the widespread disaster from yellow fever and recently by the wide diffusion of small-pox; and

WHEREAS, Hitherto the efforts of State local health organizations have proved inadequate in giving needed protection:

Resolved, That in the judgment of this council such measures should be taken by the National Government as will most effectually prevent the introduction of contagious and infectious diseases into the United States.

Resolved, That the work of the National Board of Health and its objects meet the cordial approval of this council, which respectfully and urgently requests the Congress of the United States to make the necessary appropriation to enable the National Board of Health to continue its work.

The subjects of the prevention of the introduction of small-pox, the vaccination of immigrants, and the inspection of railroad trains were vigorously and lengthily discussed. A resolution was passed endorsing the Harris bill now before Congress, and urging the different State boards composing the council to use their influence with their members of Congress to secure its speedy passage, so that the proposed scheme of railroad inspection may be inaugurated as soon after the 1st of May as possible.

Upon motion of Dr. R. W. Mitchell of Memphis, a committee was directed to be appointed, which shall inquire what effect, if any, the inundation of the Mississippi river may have on the general health of the people of the Mississippi valley, and report at the next annual meeting.

Drs. G. B. Thornton of Tennessee, Thaddeus M. Stevens of Indiana, L. F. Salomon of Louisiana, and R. J. Farquharson of Iowa, were appointed such committee.

The following were present at the meeting:

STATE BOARDS OF HEALTH—Arkansas: J. A. Dibbrell, jr., M. D., secretary. Illinois: John H. Rauch, M. D., secretary. Iowa: R. J. Farquharson, M. D., secretary. Kentucky: John J. Speed, M. D., secretary. Michigan: Henry B. Baker, M. D., secretary. Tennessee: G. B. Thornton, M. D., member.

LOCAL ORGANIZATIONS.—Keokuk, Iowa, city board of health: D. B. Hillis, M. D., president. Memphis, Tennessee, city board of health: G. B. Thornton, M. D., president; Hon. David P. Hadden, president legislative council, *ex-officio* member. New Orleans, Louisiana, auxiliary sanitary association: Gustavus Devron, M. D. sanitary director. New Orleans, Louisiana, medical and surgical association: L. F. Salomon, M. D., member.

NATIONAL BOARD OF HEALTH.—Hosmer A. Johnson, M. D., resident member, Chicago, Illinois. Robert W. Mitchell, M. D., resident member, Memphis, Tennessee. Officers of the council present: John J. Speed, M. D., Louisville, Kentucky, president; John H. Rauch, M. D., Chicago, Ill., secretary and treasurer.

For the ensuing year the following officers were elected: President, Dr. Gustavus Devron of New Orleans; Vice-President, Dr. D. B. Hillis of Iowa; Secretary and Treasurer, Dr. J. H. Rauch, of Illinois.

Board adjourned to 1 P. M.

AFTERNOON SESSION.

Board met at 1 o'clock P. M.

Present—Drs. Robertson, Dickinson, Hull, Reynolds and Lewellen.

Board proceeding to an election of officers for the ensuing year, the following were elected: Dr. W. S. Robertson, President; Dr. R. J. Farquharson, Secretary.

On motion it was ordered that the salary of Mr. Andrews, as Assistant Secretary, be raised by $50 for the next six months.

The following list of the expenses of the members attending the meeting was approved:

Dr. Reynolds	$ 23.00
Dr. Robertson	5.00
Dr. Lewellen	50.00
Dr. Dickinson	20.00
Dr. Hull	34.00
Dr. Olney	30.00
	$162.00

PROCEEDINGS OF NOVEMBER MEETING.

MORNING SESSION.

DES MOINES, Wednesday, November 1, 1882.

The Board met pursuant to call of the President, at 10 o'clock, A. M.

Present—Drs. Robertson, Lewellen, Olney, Clark, Dickinson, Reynolds and Hull, and Loring, C. E.

Minutes of last meeting read and approved.

Reports of standing committees being called, Dr. Hull, from the Committee on Ventilation, read a report which was received and ordered printed in the biennial report.

The report of the Committee on Education and Construction of School-Houses was continued; also the report of the Committee on Epidemic Diseases.

The report of the Special Committee on Scarlet Fever in Southwestern Iowa was continued.

The Secretary presented the following report, which was read and approved:

SECRETARY'S REPORT.

Gentlemen—Since the May meeting I have, at the request of the President, attended two sanitary meetings.

The first was held at Port Huron, Michigan, on May 18th.

The following report, sent to the President of the Board on May 23d, will give some idea of the purpose and action of the meeting:

DES MOINES, May 23, 1882.

DR. W. S. ROBERTSON, *President State Board of Health meeting:*

Dear Doctor—Arriving in Chicago on the morning of the 17th, I remained there until evening. Visiting the office of the Health Commissioner, Dr. DeWolf, I learned much from him in regard to the prevention of small-pox

and its treatment in that city. Chicago has done and is doing a noble work, for the protection, not only of her own people, but of all those States to the west which are reached by the great tide of immigration which flows through that city. An inspection of the record book of the small-pox hospital showed a total of eight hundred and thirty cases admitted, of which eighty-two now remain in that institution; of these but twelve can speak or understand English, this fact proving that the great majority of the inmates are recently arrived immigrants; the most of them having been less than a month in this city.

I was disappointed to learn that neither Dr. Rauch, Secretary of the Illinois State Board of Health, nor Dr. DeWolf, Health Commissioner of Chicago, could attend the conference at Port Huron.

This meeting was held at 2 P. M. on the 18th instant, in the United States court room, and had a very full attendance of the members of the Michigan State Board of Health, and others interested in sanitary matters. The discussion, which was general and spirited, was not confined to the medical men, but was participated in by lawyers, clergymen, business and railroad men, this fact showing not only the general intelligence of the people of Michigan, but also the educating effect of the efficient officers and admirable personel of the Michigan State Board.

You will learn the general proceedings of the meeting from reading the published account, a copy of which I will send as soon as it reaches me.

Suffice it to say here, that the system of inspection and vaccination of immigrants, which had already been started at the sea-ports, under the auspices of the National Board of Health, was extended to Port Huron and Detroit, ports at which it was greatly needed; for I found, much to my astonishment, that there was absolutely no inspection or examination of immigrants whatever, whole trains transferred by ferry-boat from Canada, being brought directly from ships at Quebec and Montreal. The following incident, narrated by Dr. Barker, Secretary of the Michigan State Board of Health, aptly reveals the true nature and great danger of this state of affairs, which is particularly interesting to us, as these new immigrants are transferred from Chicago to Manitoba, through the State of Iowa, by the C., R. I. & P. R. R., along the "Round Robin Hood's barn" route, through West Liberty, Cedar Rapids and Albert Lea.

Dr. Baker was informed by a conductor of the Grand Trunk railroad that on the 15th instant he found a man with small-pox, and upon a refusal of the health officer at Battle Creek to remove the case from the cars he was carried on to Chicago.

Upon inquiry, upon my return to Chicago, it was found that a Canadian, afflicted with small-pox, was arrested on the evening of the 18th, at the Grand Trunk depot, and transported to the hospital; another Canadian, similarly afflicted, was also arrested at this depot, upon the arrival of another and later train upon the same road.

In regard to Chicago, it was determined, in consequence of the absence of both Drs. Rauch and DeWolf, and of the supposed existence of an efficient system of inspection of incoming trains by the health authorities of that city, to postpone action for the present. It was also determined, in regard to points west of Chicago, that no inspectors were needed now.

Upon my return to Chicago, on the 20th instant, it was discovered, much to my surprise, that no inspectors were sent out to meet the incoming immigrants, that such had never been the custom, and that the health authorities depended solely upon the sanitary and ordinary police to pick out small-pox cases at the depots, upon the arrival of the trains.

On this account, upon my arrival here, I immediately wrote to Dr. Stephen Smith, member of the National Board of Health, at New York, informing him of this state of affairs, and urging upon him the imperative necessity of the organization of a system of inspection at that point, under the National Board, for the protection of the States to the west.

The following gentlemen attended the conference at Port Huron:

Dr. Stephen Smith, of New York, member of the National Board of Health.

Hon. Leroy Parker, of Flint, President of the Michigan State Board of Health.

Dr. Henry B. Baker, of Lansing, Secretary Michigan State Board of Health.

Dr. H. F. Lyster, of Detroit, member of the Michigan State Board of Health.

Dr. John Avery, of Greenville, member of the Michigan State Board of Health.

Rev. D. C. Jacokes, of Pontiac, member of the Michigan State Board of Health.

Dr. Rae, of Oshawa, Ont., member of the Ontario Board of Health.

Dr. J. M. Partridge, of South Bend, member of the Indiana State Board of Health.

Dr. G. C. Ashmun, health officer of Cleveland, Ohio.

Dr. R. J. Farquharson, Des Moines, Secretary of the Iowa State Board of Health.

Dr. A. A. Thompson, health officer of Flint, Michigan.

Dr. S. S. French, health officer of Battle Creek, Michigan.

Dr. H. R. Mills, Marine Hospital Service, Port Huron.

Dr. D. M. Bennett, city physician, Port Huron.

Dr. C. E. Spencer, health officer, Port Gratiot, Michigan.

Dr. M. Northup, formerly city physician, Port Huron.

John P. Sanborn, collector of customs, Port Huron.

Dr. W. H. Smith, health officer, St. Clair, Michigan.

Dr. J. C. Wood, health officer, Monroe, Michigan.

Dr. J. H. Wellings, city physician, Lansing, Michigan.

Dr. F. B. Florentine, health officer, Saginaw City, Michigan.

Dr. M. Bates, of New Haven, health officer of Lenox township, Macomb county, Michigan.

T. J. Charlesworth, of Detroit, division superintendent Lake Shore & Michigan Southern Railroad.

Col. Henry Whiting, member of the Board of Health, St. Clair, Michigan.

George S. Granger, supervisor and President of Board of Health, Columbus township, St. Clair county, Michigan.

L. A. Sherman, editor Times, Port Huron.

Others present and taking part in the proceedings were: Dr. McLaren, of Sarnia; William T. Mitchell, and Rev. T. C. Gardner, of Port Huron. And after the object of the meeting had been briefly and distinctly stated by Dr. Stephen Smith, of the National Board, and after a general and thorough discussion, the following resolutions, prepared by a committee of five, appointed by the chairman, were adopted:

Resolved, That we deem it important that a system of immigration inspection shall be immediately inaugurated, which shall apply to all trunk lines of railroad carrying immigrants, to prevent the introduction of small-pox into the United States, and from one State into another.

Resolved, That the National Board of Health be requested to advise and co-operate with and through the State boards of health, and the several local authorities of health, whenever it may be considered advisable to carry out a proper system of inspection and control of all persons traveling through the several States, with reference to the limitation of small-pox.

Resolved, That the National Board of Health be requested to erect or otherwise provide and furnish on the borders of States, as may be required, such temporary buildings as may be necessary, and provide for the care and maintenance of persons on emigrant trains suffering from small-pox, when committed to these hospitals.

Resolved, That, inasmuch as a considerable number of the immigrants coming into the United States, or passing through them, necessarily travel through the Dominion of Canada, we do cordially invite the co-operation of the Canadian authorities in inaugurating a system of inspection of such immigrants, in order to prevent, as far as possible, the spread of small-pox.

Resolved, That this conference commend the action of such transportation companies as have established a system of inspection and the issuing of protection cards, and earnestly request all other steamship companies engaged in transportation to co-operate with local and other inspectors of immigrants in transit as a means of suppressing the spread of small-pox.

Resolved, That this conference is gratified to learn that many railway lines have already pledged co-operation in efforts of inspection, and we earnestly request all other railway trunk lines engaged in the transportation of immigrants to co-operate in inspection and the enforcement of regulations looking to the limitation of small-pox.

Resolved, That it is desirable that this system of immigrant inspection shall begin generally throughout the country by June 1, 1882.

This system of inspection, which embraces, as you see, first an inspection and vaccination, if necessary, of emigrants while crossing the ocean, by the surgeons of the ships, who furnishes each person with a card explaining the result of his examination; secondly, an inspection and vaccination of immigrants by the quarantine officers at their port of entry; thirdly, an inspection and vaccination of immigrants while in transit on railroad cars. The corps of inspectors, composed of two supervising inspectors and seventeen inspectors, are stationed as follows: seven at Chicago, two at Port Huron, two at

Detroit, one at Fort Gratiot, Mich., one at Rochester, N. Y., one at Hornellsville, N. Y., one at Pittsburg, Penn., one at Cleveland, Ohio, one at Grafton, West Va., one at Springfield, Ill., one at East St. Louis, Ill.

Of the magnitude and efficiency of this sanitary work the following extracts from the October report of the western district (which virtually embraces all emigrants to the west from Minnesota to Texas), made by Dr. Rauch, the supervising inspector, will best demonstrate a summary of the work done up to the close of the quarter, September 30, 1882, which is as follows:

Immigrants arriving and inspected over the P., Ft. W. & C. R. R., 14,825, of which number 12,676 were more or less perfectly protected, while 2,149 were found to need vaccination or revaccination.

Over the L. S. & M. S. R. R., arrived and inspected, 11,402; protected, 9,382; requiring vaccination or revaccination, 2,020.

Over the Michigan Central, 19,131; protected, 14,026; requiring vaccination or revaccination, 5,105.

Over the Grand Trunk, 8,237; protected. 6,486; requiring vaccination or revaccination, 1,751.

Over the Baltimore & Ohio Railroad, 8,193; protected, 6,448; requiring vaccination or revaccination, 1,745.

Passing the Indianapolis station for points west, 10,413; protected, 9,560; requiring vaccination or revaccination, 853.

Crossing the Mississippi at St. Louis, 6,785; protected, 6,440; requiring vaccination or revaccination, 345.

From the foregoing it will be seen that of the total 78,986 immigrants who have arrived in or passed through this district since the 1st day of June, nearly 14,000 were susceptible to small-pox and capable of conveying and propagating the contagion throughout the vast region of the Northwest As has been before remarked, the service is not only a protection to Illinois, but to the entire Western region beyond, north to Minnesota and south to Texas.

During the season nine cases of small-pox and varioloid have been detected and removed from trains before reaching the State, and within three weeks one case was removed to the Chicago small-pox hospital by the Inspector, and four others were properly cared for by the St. Louis Inspector. The former patient was destined for Neenah, Wisconsin, and the latter (a party of Bohemians) for Missouri.

That this good work continues the following extract taken from a paper since the date of the above report (October 1) shows:

From an immigrant train on the Pennsylvania railroad coming into Chicago Inspector Starkweather took seven cases of small-pox, three women and four children. There were eighty-five immigrants on the train. The seven persons with small-pox had been on the road from New York three days, and came from Germany in the steamship Herder.

Two of the women were on their way to Davenport, Iowa. To this I may add, of my own knowledge, that the two women arrived in Davenport early last week, having passed through the attack in the pest house at Chicago.

Although it cannot be positively asserted the rigid inspection of immigrants was the sole cause of the remarkable decrease in the numbers of small-pox cases observed in Chicago, yet all must admit that such inspection was the most important factor in that decline as shown in the following table:

MONTH.	Cases reported.	Deaths.	REMARKS.
April	321	95	Inspection began June 1.
May	181	65	Average decline before inspection, 12 per cent.
June	154	29	
July	44	11	Average decline since inspection, 78 per cent.
August	24	5	
September	7	3	

At the first of this month the National Board of Health found itself so crippled in its resources by the failure of Congress at the last session to make a sufficient appropriation, that it felt itself obliged to discontinue this inland inspection service, the expenses of which, as you are aware, are defrayed by that board. Upon this announcement, Dr. Rauch determined to carry on the Chicago inspection by the State Board of Illinois. Fortunately, greatly to our benefit, an arrangement was made, by decreasing the number of inspectors and giving greatly reduced pay to the remainder, to continue the present system of inspection, for a time anyhow. That this great protection to Iowa and other northwestern States should not fail, hereafter, for lack of the small amount necessary, should be the care and lookout of all sanitary bodies, and of all individuals who truly desire the prosperity of the country.

AMERICAN PUBLIC HEALTH ASSOCIATION.

The next sanitary meeting attended by me was the annual meeting of the American Public Health Association, held at Indianapolis on the 17th, 18th and 19th days of October.

Althought at some other meetings there may have been a larger general attendance, this one was notable above all others, in the presence of the greatest number of persons directly interested in sanitary matters, embracing most of the eminent sanitarians of the United States.

The personel of this association, its officers, committees, etc., are too well known to require recapitulation here.

I shall, therefore, proceed to mention briefly such subjects as were discussed before the association, and its action thereon, these subjects embracing both those of general sanitary interest, and also some of peculiar interest to our State.

NATIONAL MUSEUM OF HYGIENE.

Dr. Albert L. Gihon, U. S. N., Washington, D. C., chairman of the committee on the National Museum of Hygiene, made the report of that com-

mittee, which, after reciting the action of the committee in returning the thanks of the association to Surgeon-General Wales for his offer of the National Museum of Hygiene for the use of members, continues:

"The action of the association at Savannah was enthusiastically supplemented by the American Medical Association, at its thirty-first annual meeting, at St, Paul, Minnesota, June 8, 1882, which unanimously adopted the following resolution, reported to it on the section on State medicine:

"*Resolved*, That the American Medical Association heartily indorses and commends to Congress the proposition of the Surgeon-General of the Navy to establish at Washington, in connection with the Bureau of Medicine and Surgery of the Navy, and in co-operation with the American Public Health Association and the American Medical Association, a national museum of hygiene, which shall exhibit the history and progress of sanitary science by a collection of publications, articles, models, drawings, etc., illustrating defects and improvements in foods, in water supply, bedding, clothing, in marine architecture, house and hospital construction and furniture, apparatus for heating, illumination, ventillation, and removal of excreta and refuse, culinary, laundry, and bath facilities, and for physical culture and exercise, and whatever else tends to the preservation of health and the prevention of disease.

"*Resolved*, That this Association earnestly urges upon Congress the appropriation of the sum of $10,000, which has been recommended for the purchase of exhibits and their subsequent care and preservation, and that the permanent secretary shall without delay send a copy of these resolutions to each member of Congress.

"The importance of the undertaking was promptly recognized by Congress in the appropriation of the preliminary sum of $7,500 for the rent of a building, the transportation of contributions, and the preparation of models, etc., illustrative of sanitary science.

"The Surgeon-General of the Navy has accordingly issued a circular, hereto appended, announcing the establishment of the museum, explaining the scope of the enterprise, and soliciting contributions of articles, apparatus, models, drawings, etc., in illustration of every department of sanitary science.

"The plan outlined is a very broad one, and its successful completion will depend upon the generous and interested co-operation of the sanitarians of the country. It is not proposed that the museum shall be a cabinet of curiosities, hidden behind glass cases under lock and key. It is to be a working place, where every student may see and handle, and its books are collected that they may be read by the greatest possible number. Four thousand volumes have been already accumulated, the intention being to make the collection of hygienic authorities as extensive and complete as can be done. An important adjunct of the museum, already in operation, is its experimental physiological laboratory, for the investigation and demonstration of biological phenomena, in which apparatus of the value of over $2,000 have been purchased and are available by any experimenter who may desire to engage in this research. Analyses of foods, the study of the microscopic organisms of the atmosphere, the examination of the ground air at various depths, are among the investigations now being conducted at this laboratory.

"Your committee, therefore, beg to express the hope that each member of the Association will feel a personal interest in the success of the museum

and library, and will manifest that interest by contributing and inducing others to contribute to their growth, and they suggest the establishment of a permanent committee, to be entitled 'The Committee on National Museum of Hygiene,' to be the medium of communication between the Surgeon-General of the Navy and the officers and members of the Association, to be especially charged with the dissemination of information respecting the museum, and with the collection and transmission, in the name of the Association, of such contributions as it may desire to have deposited. All of which is respectfully submitted.

"ALBERT L. GIHON, M. D., Chairman,
"WM. H. FORD, M. D.,
"C. W. CHANCELLOR, M. D."

Quite a radical change was made in the membership of the association, the nature of which will be fully comprehended by reading the third article as amended:

"The members of this Association shall be known as active and associate. The Executive Committee shall determine for which class a candidate shall be proposed. The active members shall constitute the permanent body of the Association, subject to the provisions of the constitution as to continuance in membership. The associate members shall be elected only for the year for which they ore proposed, and shall have all the privileges and publications of the Association, but shall not be entitled to vote. They may be re-elected."

A few other mere verbal alterations were made in other sections, but these were of no general importance.

From the able address of Dr. R. C. Kedzie of Michigan, President of the Association, I would beg leave to take the following extracts as especially pertinent and interesting:

"The report of the Registrar-General of England shows that the death-rate in twenty-three and a half years has been reduced 12.2 per cent in urban and 8½ per cent in rural districts. This is a grand showing of the results of sanitary progress. Yet we are too apt to overlook the significance of these results in relation to the improved condition of the people. We fix our eye upon the inanimate figures and do not see what lies deeper than the figures—the joy and happiness which flow from this expansion of life, and which require the scientific imagination to perceive and value. But these estimates of the Registrar-General relate to human life in gross, and give us no comprehension of the condition of the different epochs of life. Life may be drawn out into attenuated helplessness without any increase of human happiness.

"By a study of the reports of the Registrar-General of England for forty years, I find that the number who complete adolescent life by surviving the twentieth year has been increased 12.6 per cent in forty years; that the number who enter adult life and pass from twenty to thirty-five years has been increased 12.2 per cent. In other words, in a given population where eight persons passed from childhood to manhood forty years ago, more than nine

now join the ranks of productive manhood; where eight persons survived fifteen years of active toil, nine persons now attain the same age. The waste of life in childhood is checked in part, and those saved from premature graves with all its measureless woe, have been added as joyful recruits to the reapers in life's harvest. There is something vastly more significant than a mere extension of life in gross; it is an addition in particular to that period of existence when the real work of life is done. If to relatively diminish the number of non-producers by bringing a larger proportion to the producing age, is worthy only of a sneer, then it is difficult to say what achievement in human progress is worthy of commendation. By thus laying her guiding hand upon those wide-reaching forces and causes which mold human destiny sanitary science has inaugurated a revolution in human society as pervasive yet as silent as the dawning of the morning which comes 'with healing on its wings.'

"When we look at the influence of sanitary science in removing the causes of death, we find the same evidence of progress. Take the zymotic diseases, which may affect every age, and against which the robust are scarcely more protected from attack than the feeble. They are the 'destruction which wasteth at noonday,' as well as the 'pestilence which walketh in darkness.' Two hundred years ago small-pox was the cause of death of 96 out of every 1,000 deaths in England, and 66½ out of every 1,000 deaths in Germany. Now the mortality from small-pox is less than one in one thousand. Sanitary science has thus saved 95 deaths in every thousand in England and 65½ in Germany. The saving of life by vaccination every year is equal to one-tenth of the standing armies of Europe. In Mexico three and one half millions perished by one visitation of this fell disease. If one hundredth part of this number should die in any nation by a single epidemic, the world would stand aghast in horror. The black death that slew 25,000,000 in Europe is a thing of the past, and will never again be possible until sanitary science is forgotten. Other diseases supposed to be less amenable to the control of science have been checked, if not exterminated. Within thirty years the number of deaths from typhus, typhoid and continued fevers has been reduced more than one half. These destroyers of life are kept at bay only by the unremitting exertions of science. When science shall push into still wider fields of research and shall fully reveal the germs which cause measles, scarlet fever, diphtheria and consumption, and shall provide a method of inoculation, or discover germicides which shall protect the race from their influence, what tongue of prophet or harp of evangel shall portray the future life of the race?

"I have no patience with the cold cruelty of semi-science which calmly contemplates the preventable sickness and death, and hails these as weeding and pruning processes by which to make the race better and stronger. If only the weak and puny were taken away there might be a cold-blooded force in such reasoning, but we find the strong and vigorous smitten down along with the weak and helpless. It is not the worthless and the wicked alone that are weeded out by death. The pistol-shot which may arrest a burglar may also smite down a Lincoln and a Garfield. Small-pox and diphtheria may sweep away the lowest, and yet not spare the highest in social rank. The typhoid

fever which may smite the beggar in his hovel may also slip into the royal palace to lay its withering touch upon the heir to the throne. It is not reserved for human wisdom to decide who shall live and who must die in order to subserve the highest interests of the race. It was a murderer, and to conceal the murder, who first raised the doubt, 'Am I my brother's keeper?' Preventable sickness unprevented is a crime against society; preventable death not prevented is a crime against God.

"When persons are engaged in any enterprise involving a multiplicity of details so that the immediate particulars fill the eye to the exclusion of any view of the work as a whole, it is often a help to the weary worker to pause long enough to grasp the outlines of the field of endeavor, and to note the signs of progress, and thus take heart for new work, or to note the points where failure is seen in order to direct efforts where best results may be secured.

"With reference to preventive medicine, we may appropriately utter the challenge of the old Hebrew bard: 'Watchman, what of the night?' and as in the days of old comes back the response, 'The morning cometh, and also the night.' Signs of encouragement and cheer for the race, like the breaking of the morning after the long night of woe; also signs of discouragement and failure, like the sable wings of night which shut out the sun of prosperity and cover the stars of hope. But this is the history of human progress in every field and for all time. No army with widely-extended front ever marched with even pace to victory without check or temporary defeat in any of its divisions. The same is seen in all of nature's processes. Spring comes not with serene and even-paced advance, but often with sudden leaps and wild recoil. Niagara surges onward with resistless flow, but here and there are eddies and refluent waves which would make us believe that the river is flowing backward to its source. But in spite of delay and momentary defect, substantial progress is made; the chills and storms of spring do not prevent the summer; the swirls and counter currents of the river do not arrest its march to the sea. When we look at the evidence of advancement in the prevention of disease, and in the promotion of the general health, we find frequent occasions for devout thankfulness.

"Among the causes for hopefulness for the immediate future, I name the following:

"1. Extension of the knowledge of the causes of zymotic diseases, such as charbon (or splenic fever) and chicken cholera in domestic animals, and of diphtheria in human kind. All infectious and contagious diseases must soon be brought into the same category, when we shall know and identify the specific cause.

"2. The prevention of these diseases by extension of the method of inoculation. This has been done in some diseases of domestic animals. If by similar means measles, diphtheria and scarlet fever can thus be brought under control, and priceless childhood be rescued from this trinity of woe, how many a Rachel, now weeping beside her childless cradle, will be comforted?

"3. The discovery of the bacillus, which is the cause of consumption, by Dr. Koch, of Berlin, marks an epoch in the history of medicine. Tubercular consumption has been the opprobrium of medicine. It is the remorseless destroyer of our race, being the cause of one-seventh of the deaths of our race, and of one-third of the deaths in the active period of adult life. It has sown the earth with untimely graves. It is yet too early to say how much immediate benefit shall spring from this capital discovery, but any means which shall bring within our control, even remotely, this fell destroyer of our race, is full of promise. If science shall stretch forth only the hand of prevention, what a boon to our kind! If it shall finally reach forth the hand of healing and guard mankind from consumption effectually as she has saved us from small-pox, or the lower animals from splenic fever, what a shadow will be lifted from the face of our common humanity!

"Let us now turn the leaf and look at some of the discouragements.

"1. There is so much to be done and so few to do. Lift up your eyes to the redemption of the world from avoidable disease and premature death, and behold the fields are white for the harvest, but the laborers are so few.

"2. A few who profess to be reapers are wasters. They care little for the precious grain, but want the straw to make themselves a nest. With great volubility they point out the fact that the largest part of the harvest is straw, and insist that to waste so much good straw which will make them a nice warm bed, merely to save a little grain, is unconstitutional waste, and an invasion of reserved rights. This was to be expected. Eden had its serpent with his plausible suggestions of profit to be secured by wrong-doing. Christ found his Judas, whose eye was ever on the purse, and our own revolution had its Benedict Arnold, willing to sell out struggling right for personal profit.

"3. A third cause of discouragement is found in what may be called the hostile indifference of Congress and the Executive to the National Board of Health. The American Public Health Association and the Sanitary Council of the Mississippi Valley were active in securing the organization of the National Board of Health. Both the association and the council are firm believers in the need—aye vital necessity—for a National Board of Health, whose jurisdiction shall be conterminous with the national boundaries, backed by national authority and sustained by the national purse in its holy warfare upon communicable and preventable disease. State's rights may glitter and splutter upon trivial questions of politics, but disease will not pause at State lines nor halt at municipal boundaries. When destruction takes on winged form and comes floating on the very winds to lay waste our heritage, then we want some power whose jurisdiction shall be as wide reaching as the wings of the destroyer, and shall command every force and resource requisite to withstand the invading foe. Look at the situation. Small-pox has been pouring in with the flood of European immigration, and but for the timely action of the National Board of Health, and the efficient aid of a few State boards of health, the Northwest would have been one widespread hospital for small-pox, and the commerce of this vast region

closed for a time. Yellow fever has been flickering like the baleful fires of the tomb along our Gulf borders, and lately has blazed up into an epidemic, destroying life, wasting large communities with sickness, and crippling the commerce of our Gulf coast—inflicting a money loss exceeding tenfold the entire cost of the National Board of Health to say nothing of the suffering and death thus entailed.

"When we look to the future the prospect is not reassuring. The same destructive agencies will continue to work in the future as they have in the past. When we turn our eyes to the East we find additional cause for apprehension. Cholera has roused up from its lair in the jungles of India; is now laying waste the islands of the Indian ocean, and will soon start on its sweep westward to lay waste Europe, to charge across the stormy Atlantic, and, like its predecessors, to die out in the valley of the St. Lawrence or along the banks of the Mississippi. Is this a time to withdraw the watchmen who guard the public safety, to call in our trusty picket line and hope to meet the destroyer with the fulmen brutum of States' rights, or the guerrilla warfare of isolated municipal action.

"The painful conviction abides with us that a fearful blunder has been made in thus crippling the National Board of Health, and that we have been guilty of the folly of changing front in presence of the foe.

"We thus see that light and shadow alternately flit across our landscape, but the light grows stronger and the shadow less somber. But we should remember that whether in sunshine or in shade, the landscape still remains. In health or in sickness, in pleasure or in pain, the race moves on forever, keeping even step with the noiseless footfalls of time; that whatever we may contribute toward improving the condition of our race will be a permanent addition to the welfare of our kind, while our errors and mistakes, like dead leaves and useless chaff, will be mercifully buried in our graves. We are now painfully and wearily sowing the seed, but the generations to follow us shall reap the joyful harvest. Because we are only sowers, and because we shall never thrust in the sickle of the reaper, let us be only the more careful to scatter precious seed. Though our eyes shall never behold the sheaves of that far-off summertime, our ears may yet catch the echoes of their harvest song. Listen to the refrain: 'There shall be no more thence an infant of days; nor an old man that hath not filled his days, for the child shall die an hundred years old.' In the ages past how large a proportion of human beings were ushered into existence whose life was measured not by years or months, but were literally infants of days. By the advancement of sanitary science and the stricter enforcement of sanitary law, the proportion of 'infant of days' has been steadily diminished, and a constantly increasing number pass on into adult life. Year by year and age by age a smaller number die in infancy and a larger proportion pass forward to productive manhood. With wider knowledge and more general enforcement of sanitary law, this diminution of infant mortality and expansion of human life will go forward with ever-increasing momentum till life will attain its normal limits, and every child shall reach his hundred

years. Not only will life be extended, but the long life will be full of joyful activities, and man shall fill his days. For this we toil and hope. God speed the day!"

VACCINATION.

A very good paper was read on "The Uses and Abuses of Animal Vaccination," in which the author strongly advocates the use of bovine virus, which should by preference be obtained from adult cows. In regard to this and the supposed infrequency of natural or spontaneous cow-pox, he says:

"Analogy would lead us to employ females. So far as I can learn by observation and inquiry, spontaneous cow-pox (if the term be a correct one) occurs only in cows, and usually in those that are giving milk. Of at least twenty cases of natural cow-pox which I have inspected during the past eleven years, all occurred in milch cows, and I find this statement confirmed by the observations of intelligent farmers and drovers of cattle. The theory that natural cow-pox is a rare disease has no foundation in fact, and only gives evidence of a neglect of careful observation of the habits of animals. One would suppose, from the extensive run of the term "Beaugency," that such a case is almost unknown in America, a land abounding in cattle, and annually exporting thousands to foreign ports."

But in the discussion which followed, Dr. E. L. Griffin (formerly of Wisconsin, now of Chicago), a man of great experience in the propagation of vaccine matter, stated his preference for calves; and also that "cases of spontaneous cow-pox were rare, but cases of spurious cow-pox were common."

NATIONAL BOARD OF HEALTH.

The paper on this subject, so important in the present crisis of affairs in regard to the work, and even the existence of that body, was read by the President of the Board, Dr. J. L. Cabell. The report was quite long, occupying an hour in its reading. The following brief extracts will give some idea of its purport:

"The National Board of Health having been placed by the recent action of Congress in the anomalous and embarrassing position of a body charged with important and responsible duties, and yet deprived of the means of efficiently executing them, some of its members who had been appointed from civil life felt it was incumbent upon them to consider what course of action on their part would best subserve the interests of the public health, placed in jeapordy, as they conceive, by recent legislation. In consideration of the fact that the Board of Health owes its existence to the efforts of this association, and of the further fact that their own appointments were largely due to the recommendations of a committee of this body, they have decided to refer the question to the association itself, and to this end they have directed me to address a communication, as its presiding officer, setting

forth a summary statement of the operations of the board since its organization, in 1879, which they desire to be placed on permanent record.

"The occasion is specially adapted to a review of the work of the National Board by this association, in view of the fact that the law under which the board has accomplished its greatest and most beneficent work—that of preventing the introduction and spread of infectious diseases—will lapse by limitation unless renewed at the next session of Congress. It is for the American Public Health Association to determine how far the National Board of Health has fulfilled its mission, and whether it is to be destroyed or supplanted by adverse legislation."

Dr. Cabell then proceeded to give a summary statement of the operations of the National Board of Health from the date of its organization to the present time, consisting: (1.) Of aid to State and local boards of health in the execution and enforcement of their rules and regulations to prevent the introduction of contagious or infectious diseases into the United States from foreign countries. (2.) Aid to the same parties in maintaining sanitary inspection on the Mississippi river. (3.) The inspection of immigrants with reference to the protection of the people of the United States from the introduction of small-pox by said immigrants. In connection with the above branch of the operation, Dr. Cabell cited the following passage from a report made to the Senate of the United States at the late session of Congress from the select committee to investigate and report the best means of preventing the introduction and spread of epidemic diseases. In this report the following statements are made with the unanimous approval of the committee:

"The epidemic of 1879 at Memphis and New Orleans made its appearance before the National Board had been able to perfect its plans of prevention; though it is, in the opinion of the committee, doubtful whether that epidemic could have been prevented, as it is not certain whether it originated from the germs of the epidemic of 1878, which had survived, or in fresh importation of the disease. But, under the rules and regulations adopted by the board to deal with it, it was actually stamped out in New Orleans, and confined to the limits of Memphis; and, instead of the general demoralization and panic, with suspension of business, trade and commerce, which pervaded the country in 1878, commerce and communication with the infected cities were regulated, not stopped, or even retarded to any considerable extent, and the general business of the country went on in its usual methods, and through its usual channels, without serious interruption. Instead of panic and alarm, confidence and a sense of security pervaded the country. The great transportation companies of the South, both river and rail, are unanimous in their approval of the action and methods of the National Board in dealing with such cases, because experience has shown that they give the necessary security against the spread of the disease, without stopping, or retarding to any considerable extent, commercial intercourse. They have learned from their own experience that the certificate of the National Board of Health as to the sanitary condition of any city, or place, is ac-

cepted by other cities and States as testimony coming from a strictly impartial and well-informed authority, independent of all local interests or influences, commercial or otherwise. In the opinion of the committee, it has accomplished much, and is capable of accomplishing highly important results of great benefit to the country, results which can be accomplished by no other agency."

Dr. Cabell then gave a brief account or the proceedings of the International Sanitary Conference of Washington, and expressed his regret that, although the delegates of the United States obtained most important concessions of international comity, the ratification of which would have been of the utmost consequence, Congress has not yet taken the first step to secure such ratification. Dr. Cabell also gave an enumeration of the various special scientific investigations which had been conducted under the auspices of the National Board, and cited the testimony of eminent authorities of Europe to show the value of such investigations with reference to their sanitary applications. After noticing certain charges made against the Board, Dr. C. concluded as follows:

"It will thus be seen that the National Health organization, which the association has been so largely instrumental in bringing into existence, is in some danger of extinction for the want of adequate support by the National Legislature. In view of this fact, it is considered pertinent and proper to suggest that the members of this association may do a most useful work in instructing their representatives in Congress as to the value of the work performed by the National Board of Health, and the indisputable necessity of more liberal appropriations to enable it carry on its work with due efficiency. Without such effort there is danger of losing the ground gained in 1879, which if so lost now will probably not be regained for many years to come. In making these efforts it may be important to bear in mind the source and character of the hostile agencies combined to overthrow the National Board of Health. We may be permitted to refer to a few of them:

1. The State Board of Health of Louisiana, backed by a portion of the press of New Orleans, in its repeated allegations that the National Board of Health has interfered with and obstructed the local authorities, instead of aiding them, as required by law. The interference consists in the National Board establishing an inspection service within the limits of New Orleans, being induced to take this action in compliance with the request of the health authorities of the Mississippi valley States, including those of Louisiana itself. Nothing short of this will satisfy other communities having intercourse with that city, which would certainly be quarantined by its neighbors to a most inconvenient extent if it were not for the protection it derives from the certificates of the inspecting agents of the National Board.

2. The powerful influence of the Treasury department, which asserts a claim to the disbursement of all funds appropriated by Congress for the sup pression of epidemics, and to the selection of its own medical officer, the chief of the Marine Hospital service, as its agent in these operations, although an express provision of an existing act of Congress repeals all previous acts conferring sanitary powers on that branch of the public service, and clothes the National Board of Health, which includes in its membership a detailed officer of that service, with all the power assumed by the general government in respect to quarantine and sanitary matters.

3. As composed of medical men selected without regard to party affiliations, and wielding no political patronage, the board finds no hearty support from politicians of either of the great parties of the country.

In conclusion, we desire to say that, as the present membership of the board was largely due to the unsolicited choice of the advisory committee of the Public Health Association, we abide its decision as to our longer continuance in these positions, preferring, if deemed consistent with the public good, to be relieved by the selection of others, who may, perhaps, command a larger share of public support.

L. M. BEMISS.
J. L. CABELL.
R. W. MITCHELL.
STEPHEN SMITH.
T. L. VERDI.
H. A. JOHNSON."

After an animated discussion, in which the speakers, with a solitary exception, were of one opinion, the following resolutions were unanimously adopted:

Resolved, That this Association has listened with great interest and satisfaction to the analysis and detail of the work accomplished by the National Board of Health, as furnished by the President of the Board; and that we commend its careful perusal to all upon whom, as legislators or sanitarians, devolves the care of the public health, not only as showing the scope of its faithful and efficient administration, but as suggesting and illustrating the permanent demand there is for a sustained national organization of this general character.

Resolved, That there is a work to be done by such a board which cannot be done by any local or State board, and which is not, and cannot be, adequately represented or fulfilled by any other branch of the national service, as illustrated in its inspections and inquiries into special conditions so serious as to be national rather than local; in its dealings with yellow fever and smallpox; in its plans for consular health bills from foreign ports and refuge stations for a wide coast range; in its internal care over river and railroad transportation; in its investigation into malaria and widespread causes of disease; in its valuable scientific and practical inquiries into the causes and courses of epidemic; in its comparisons of statistical facts, and in its widespread distribution of information most intimately affecting the vital conditions of our whole population.

Resolved, That, while each State and each division of national service may contribute much aid in their respective spheres, we view with regret any curtailment of the functions of a board so constituted as to represent and unify the health interests of the entire nation.

Resolved, That we counsel the National Board to continue all the work possible under its present restricted appropriations and await with confidence the extension of its powers of usefulness, and that appreciation of its work for the past and its necessity for the future, which can but result from a calm and careful estimate of the safeguards requisite for national health and prosperity.

Resolved, That the advisory council of this Association, representing, as it does, the sanitarians of the various States, be directed to use all laudable

efforts to place before the President of the United States and the Congress at Washington, and before members of Congress in their several States, the very great importance to the welfare of this country of such action by the United States government as shall increase, to the fullest extent, the means and powers of usefulness of the National Board of Health.

Resolved, That so long as the United States government confines its maritime and inland quarantine service to the aiding of State and local boards of health, it is essential, for the best results, that such aids shall be through channels most generally acceptable to State and local boards of health, whose co-operation is requisite; and we sincerely believe that the National Board of Health is the channel most generally acceptable.

Resolved, That the confining the work of the Board to cholera, yellow fever, and small-pox, is believed to be in the highest degree injudicious. It should have the full powers for investigation of all preventable diseases conferred upon it by its constituting act, and be granted the funds necessary for this purpose, and this should be done irrespective of the action which may be taken with regard to quarantine.

Resolved, That the members of the American Public Health Association hereby pledge their individual co-operation in endeavoring to secure such national legislation as shall insure to the National Board of Health such material aid as may be needed in carrying out, with the greatest efficiency, all measures pertaining to the interests of public health.

Resolved, That the President, Vice-Presidents, and Secretary of the Association be charged with the duty of securing the complete presentation to the authorities at Washington of the full influence of this Association in favor of properly and permanently sustaining the National Board of Health.

Resolved, That the address of the President of the National Board of Health, together with these resolutions, and such other papers or resolutions as relate to this subject, be printed at once in pamplet form, to the number of one thousand.

ELECTION OF OFFICERS.

On the third day the first business transacted was the election of officers for the ensuing year, which resulted as follows, viz:

Dr. Ezra M. Hunt, of New Jersey, President.

Dr. Albert L. Gihon, United States Navy, First Vice-President.

Dr. J. E. Reeves, West Virginia, Second Vice-President.

Dr. J. B. Lindsley, Tennessee, Treasurer.

Executive Committee—Dr. Thomas L. Neale, of Ohio; Dr. T. J. Turner, United States Navy; Dr. S. P. Conn, New Hampshire; Dr. J. S. Billings, United States Army; Dr. J. J. Speed, Kentucky; Dr. H. D. Fraser, South Carolina.

The advisory council was then chosen, one for each State represented, twenty-eight in number, Dr. W. S. Robertson being continued as the repretative of Iowa.

IMPORTATION OF SMALL-POX.

Dr. A. W. Cantwell, health officer of Davenport, Iowa, read a detailed history of an "Epidemic of Small-Pox, by direct importation from Germany," on the steamship Canada. In this paper the Doctor stated that the pest-house erected by your secretary in 1876, had proved efficacious, the ventilation being perfect.

SANITARY COUNCIL OF THE MISSISSIPPI VALLEY.

A meeting of this body was also held at Indianapolis on the 19th inst., for the purpose of taking action upon the position of the National Board of Health with reference to the sanitary and commercial interests of the Mississippi Valley.

The meeting was called to order at 9 o'clock, A. M., by the President, Dr. Gustav Devron, of Louisiana, the following delegates being present:

D. W. Hand, President State Board of Health, Minnesota; E. L. Griffin, ex-President State Board of Health, Wisconsin; D. B. Hillis, of Iowa, Vice-President Sanitary Council; W. S. Robertson, President, and R. J. Farquharson, Secretary State Board of Health, Iowa; A. B. Cantwell, Health Officer, Davenport; W. B. Conery, St. Louis Health Department, Missouri; Henry B. Baker, Secretary State Board of Health, Michigan; J. R. Mills, Port Huron, Michigan; O. W. Wight, Health Commissioner, Detroit; Thad M. Stevens, Secretary State Board of Health, Indiana; T. C. Minor, Cincinnati, Ohio; J. J. Speed, Secretary, and O. R. Early, State Board of Health, Kentucky; J. A. Reeves, Secretary State Board of Health, West Virginia; W. Snively, Health Officer, Pittsburg, Pennsylvania; D. P. Hadden, President Taxing District, and G. B. Thornton, President Board of Health, Memphis; C. C. Fyte, State Board of Health of Tennessee, and J. Berrien Lindsley, of Nashville, Treasurer, A. P. H. A.; D. H. Dugan, State Board of Health, Arkansas; F. W. Mead, Mississippi; R. O. Ryan, Texas; Gustav Devron and L. A. Salmon, New Orleans, Louisiana; W. M. Chambers, and John H. Rauch, Secretary Illinois State Board of Health, Secretary of the Council.

The Secretary briefly stated the objects of the meeting, after which, on motion of Dr. Baker, of Michigan, a committee, consisting of one from each State represented in the council, was appointed to formulate an expression of opinion with regard to the work of the National Board of Health and the necessity for its continuance; said committee to report at an adjourned meeting, to be held at 5:30 P. M.

On motion of Dr. Thornton, of Memphis, it was decided to hold the next annual meeting of the council at Jackson, Mississippi.

The council then adjourned to 5:30 P. M., at which hour it was again called to order by the President, and the committee appointed at the morning session, through its chairman, Dr. J. J. Speed, of Kentucky, submitted the following:

Resolved, That the Sanitary Council of the Mississippi Valley earnestly deprecates any effort to curtail the work of the National Board of Health as likely to result in a renewal of panic and unnecessary interference with commerce and travel.

Resolved, That in the judgment of this council, founded upon intimate and extended experience, the river and rail inspections of the National Board of Health are essential to secure the confidence of the Mississippi Valley and thus to prevent avoidable interruption and disturbance of business interests, and the council, therefore, petitions Congress to give such aid to the National Board of Health as will enable it to efficiently carry out its system of sanitary inspection for the prevention of the spread not only of yellow fever and small-pox, but of all epidemic, contagious or infectious diseases.

Resolved, That this council fully indorses the action of the American Public Health Association, as set forth in the resolutions concerning the National Board of Health, adopted at the session of the association held October 18, 1882, and urges each organization represented in the council to use its utmost endeavors to influence members of Congress from their respective districts to promote the necessary legislation to secure the end above indicated.

Resolved, That the secretary of the council be instructed to transmit a copy of these resolutions to the American Public Health Association and to each organization represented in the council.

The resolutions were unanimously adopted, and on motion the meeting adjourned.

VITAL STATISTICS.

In the report of the proceedings of the American National Health Association an account of the report of the committee on vital statistics was inadvertently omitted.

Views of the association on that most important question, however, were set forth by Dr. Elisha Harris, of New York, who read the report of the committee on vital statistics, which included the following resolution, which was adopted:

Resolved, That the American Public Health Association recommends that the chief officer and expert adviser in the registry of vital statistics in the respective States, the three departments of the Federal government, and the National Board of Health, shall meet in conference at a convenient place during the ensuing six months, to examine and consider the outlines of laws, plans and methods of securing the most complete and correct registration and public uses of vital statistics in the several States throughout the nation and in all branches of the public service.

CORRESPONDENCE.

Of the voluminous correspondence of the Secretary's office, the following letters are selected as being of sufficient interest and importance to be read to the Board:

MISSISSIPPI RIVER INSPECTION.

NATIONAL BOARD OF HEALTH,
WASHINGTON, D. C., May 2, 1882.

DR. R. J. FARQUHARSON, *Secretary State Board of Health of Iowa, Des Moines, Iowa:*

My Dear Doctor—By direction of the executive committee of the National Board of Health, herewith is transmitted for your information, copies of certain correspondence received at this office which will explain itself.

The same information has been sent to Drs. H. A. Johnson, R. W. Mitchell, the State Board of Health of the Mississippi Valley, the local boards of Vicksburg and Memphis, the secretary of the Sanitary Council of the Mississippi Valley, etc. I am, Doctor,

Very respectfully, etc.,

T. J. TURNER,
Secretary National Board of Health.

NATIONAL BOARD OF HEALTH,
NEW ORLEANS, April 21, 1882.

DR. T. J. TURNER, *Secretary:*

Dear Sir—I enclose, for the careful consideration of the executive committee, copies of (1) a letter from me to President State Board of April 19; (2) his reply of April 20, and (3) my reply thereto, the latter well considered by Dr. Bemiss and self, but none the less, unsatisfactory as to "*a*" because of the vague general character of said "*a*." Copies of my letter of April 3d and the answer thereto of April 4th, have been forwarded. You are, therefore, in possession of all the documents on the subject. The letter of April 20 does, in my opinion, indicate resistance to the National Board, which should thoroughly consider what action should be taken, provided, that the State Board refuses longer to agree to those conditions which the National Board instructed me last year, April 20, were indispensable for the validity of my certificates for river and railroad transportation.

In my opinion the President of the State Board has probably determined to do all in his power to drive the National Board out of Louisiana.

I shall await instructions before taking any steps, except such as may become unavoidable, or very manifestly right.

Yours very respectfully,

STANFORD E. CHAILLE,
Supervising Inspector National Board of Health.

NATIONAL BOARD OF HEALTH,
NEW ORLEANS, April 19, 1882.

PROF. JOSEPH JONES, M. D., *President Louisiana State Board of Health:*

Dear Sir—Referring to my communication of April 3, and to your reply of April 4, I beg leave respectfully to state that an answer to mine of the 3d is very desirable at as early a date as may be practicable. Inasmuch as it is expected to re-commence the inspection service of the National Board of Health on or about May 1, some days of preliminary preparation are indispensable therefor, and I should hesitate to take necessary action until the answer of the State Board of Health is received. I beg leave to inform you that, in an official communication dated April 15, 1882, Gov. McEnery has continued to the National Board of Health the privilege of stationing one of its inspectors at the Mississippi river quarantine station.

Yours very respectfully,

STANFORD E. CHAILLE,
Supervising Inspector National Board of Health.

OFFICE BOARD OF HEALTH, STATE OF LOUISIANA.
NEW ORLEANS, April 20, 1882.

PROF. STANFORD E. CHAILLE, M. D., *Supervising Inspector National Board of Health, New Orleans, Louisiana:*

Sir—In reply to the communication of the Supervising Inspector of the National Board of Health of the 19th inst., I will state that the Board of Health of the State of Louisiana was formally placed in possession of his letter of the 3d inst. at the regular meeting on the 13th inst., but no action was taken thereon.

The next regular meeting of the Board of Health will be held on the 11th of May.

In accordance with the resolution of the Board of Health unanimously passed after its organization, the President was authorized and empowered to arrange and appoint the standing committee, and, amongst the number, I have appointed and commissioned a "*conference committee*," composed of five members (a majority of the Board), and I regard this body of eminent medical and mercantile gentlemen and sanitarians as fully competent to discuss the official communications of National and State Boards of Health in the interim between the regular meetings of the Board of Health prescribed by the organic acts of the Legislature. If therefore the Supervising Inspector will place in the hands of the President of the Board of Health of the State of Louisiana, certified copies of the following documents:

(*a*) Official communications of the National Board of Health relating to the organic acts of the legislature and the legal quarantine and health authorities of Louisiana.

(*b*) "Official communication dated April 15, 1882, of 'Gov. McEnery,' which has continued to the National Board of Health the privilege of stationing one of its inspectors at the Mississippi river quarantine stations."

(*c*) Names of quarantine inspectors proposed by National Board of Health for duty in Louisiana.

Upon the receipt of the above data, these papers, as well as the letters of the Supervising Inspector of the National Board of Health of the 3d and 19th inst., will be placed in the hands of the Conference Committee for discussion and consideration, and such reply will be furnished as the honorable members of this committee may deem appropriate to meet the official communications of the National Board of Health in accordance with the quarantine and sanitary laws of Louisiana.

Respectfully,

JOSEPH JONES, M. D.,
President Board of Health, State of Louisiana.

NATIONAL BOARD OF HEALTH,
NEW ORLEANS, April 21, 1882.

PROF. JOSEPH JONES, M. D., *President Board of Health, State of Louisiana:*

Sir—To yours of April 20th, making an answer to my communication of April 3 contingent upon my placing in your hands certain documents, etc., specified by letters, I reply—

In regard to "*a*," I have received from the National Board no such communications, bearing in anywise on the questions propounded in my letter of April 3, than those furnished the State Board last year. In regard to "*b*," a copy is enclosed; and in regard to "*c*, the only quarantine inspectors thus far proposed is D. G. F. Patton, who served last year, and for whom both Dr. Finney and yourself expressed a preference.

Respectfully,

STANFORD E. CHAILLE,
Supervising Inspector National Board of Health.

ILLINOIS STATE BOARD OF HEALTH,
SPRINGFIELD, ILLINOIS, May 5, 1882.

His Excellency, the Governor of the State of Louisiana:

Sir—To the better understanding of what follows, your attention is respectfully invited to this preamble and accompanying resolutions, a duly-attested copy of which—as adopted by the Illinois State Board of Health, at its regular quarterly meeting held in Chicago, April 13-15, 1882—was forwarded to the Louisiana State Board of Health on April 17th ult., the receipt thereof being acknowledged by its Secretary, under date April 22:

WHEREAS, It has been demonstrated that the geographical position of Illinois, and its relations with the lower Mississippi country by rail and river, are such as to render the State subject to invasions of yellow fever, whenever that disease gets a foothold below; and,

WHEREAS, It is believed that the exclusion of yellow fever from that region can only be effected through national agencies, operating for the general welfare, without regard to State boundaries, and uninfluenced by merely local considerations; therefore, be it

Resolved, That the Illinois State Board of Health formally approves of the action of such State and local boards of health as have adopted the rules and regulations of the National Board of Health and have conformed to its advice, suggestions and requirements on this subject.

Resolved, That this Board renews its approval of the Mississippi River Inspection Service of said National Board of Health, and, in the event of yellow fever appearing on the lower Mississippi during the coming summer, the Secretary be, and he hereby is, authorized to make application to the National Board, in the name of the Illinois Board, for the establishment and maintenance of an inspection station, or stations, of said service to be located at such point or points, as, in his judgment, are best calculated for the protection of the State.

Resolved, That in such event no railroad or steamboat travel or traffic from any point or place within the compromised territory to any point or place within this State be permitted except in accordance with the rules, regulations and requirements of the National Board of Health.

Resolved, That the Secretary be, and he hereby is, instructed to transmit duly authenticated copies of this preamble and resolutions to the Secretary of the National Board of Health, and to the Secretaries of the various State and local boards of health interested.

Official information being this day received, to the effect that, owing to the attitude of the Louisiana State Board of Health, the Inspection Service approved of in the foregoing resolutions has not yet been re-established, and cannot be so long as that attitude is maintained, it becomes my duty, on behalf of the Illinois State Board of Health—the chief quarantine au-

thority in this State—to notify your Excellency—in your capacity as the chief quarantine authority of the State of Louisiana—that, in the event of yellow fever being reported, officially or otherwise, in the city of New Orleans or the State of Louisiana, it will be imperative upon the State Board of Health of Illinois to declare and enforce a rigid quarantine against commercial and personal intercourse with said city and State.

It is unnecessary to say that such action will be taken very reluctantly; but this Board, by the attitude of the Louisiana State Board, is left no alternative in the discharge of the duties imposed upon it by law, duties of the most vital and important character, namely, the supervision of the interests "of the health and life of the citizens of the State;" and for the proper and efficient discharge of which high official responsibility it is clothed with plenary power "in all matters pertaining to quarantine."

Obviously, it cannot hesitate to exercise this power if, thereby, it may prevent a repetition of the avoidable loss of life, sickness, and suffering which resulted in some portions of the State; and the pecuniary sacrifices, commercial interruptions and embarrassments, the panic and apprehension, which were inflicted upon this and adjoining States, as consequences of the last epidemic occurrences of yellow fever in New Orleans, to-wit: in the years 1873 and 1878.

Should yellow fever again appear in the State of Louisiana in the absence of an efficient inspection service—such as that maintained during the past three summers with signal benefit in preserving confidence and a sense of security—there remains no safety for the southern portion of this State save in absolute non-intercourse with the infected region. But while a quarantine of exclusion may be relied upon to do this, it will, of course—as in the past, so in the future—prove totally inadequate to prevent the frequent panic and alarm, bred of rumor, the distrust and apprehension always rife in the absence of impartial and accepted agencies of observation and information. Between "the interests of the health and life of the citizens of the State," however, on the one hand, and their commercial interests on the other, the duty and the obligations of this Board are clearly defined.

This Board has sought—by such agencies as sanitary councils and conferences; by uniform systems of river and rail inspections; and by urging the assumption of national authority over maratime quarantines, whereby the sanitary control of national frontiers and highways should be administered in the interests of the whole country and not exclusively in those of a city, State, or section—to make it possible to discharge its legal obligations, with respect to health and life, in such manner as, not only not to interfere with, but directly to facilitate and protect, commerce and travel by making them safe from contagion and infection.

It is fitting and proper that these facts be recited in this connection in order that the responsibility for a quarantine of exclusion, with its attendant annoyances, interruptions of travel and traffic, and not infrequent hardships, may be placed where it justly belongs.

A copy of this communication will be forwarded to such other State Boards of Health (and local boards) as have also requested the re-establishment of the inspection service, to the end that such uniformity of action as is still possible may be secured throughout the rest of the valley.

I am, sir, very respectfully,

JOHN H. RAUCH, M. D.,
Secretary.

VACCINATION.

27 DUDLEY ST., BOSTON, MASS., April 21, 1882.

DR. FARQUHARSON, *Secretary Board of Health of Iowa:*

Dear Sir—I propose reading a paper at the approaching meeting of the American Medical Association on "Defective methods of preparing and employing vaccine virus and their ill results." Can you furnish me with any facts to be used in such a paper? I am induced to address you because I have been informed that "bad cases" have occurred during the past winter in your State which were attributed to the use of what are called "Cones of pure bovine vaccine virus." If my information has any foundation in actual occurrences, I should be very much obliged by such information as would either itself inform me as to the facts or enable me to obtain such information from others.

I remain very truly yours,

HENRY A. MARTIN, M. D.

IOWA STATE BOARD OF HEALTH,
DES MOINES, May 10, 1882.

DR. HENRY A. MARTIN, *27 Dudley St., Boston, Massachusetts:*

Dear Doctor—Your kind favor of the 21st ult. came duly to hand. I have delayed answering it until now, that I might make some inquiries in the matter. I find one physician here (Des Moines) who has used the "cones" spoken of for two years past. He has observed no ill effects from them.

At the recent meeting (May 2d), of our State Board of Health, upon inquiry, I could learn of no abnormal manifestations from vaccination of any kind.

Yours truly,

R. J. FARQUHARSON.

SMALL-POX.

DAVENPORT, IOWA, May 31, 1882.

DR. R. J. FARQUHARSON, *Secretary State Board of Health:*

Dear Sir—I instructed our clerk to send you a report each week of small-pox. Since the 19th of April we have had eleven cases. Nine of them a genuine article who had never been vaccinated; two of varioloid, adults who had been vaccinated in childhood. We have had three deaths; two at hos-

pital, and one in city. This morning one case of varioloid in city is all. Others in hospital. I had a house 12x32 built for those that were well; have eleven in it. Seven sick in hospital. The ventilation is grand.

Yours,

A. W. CANTWELL.

DAVENPORT, IOWA, May 26, 1882.

Small-pox pretty lively here. I have been on duty at hospital till yesterday, when I turned things over to Grant. I had four patients all last week with the disease. Four more came in yesterday. I never appreciated your little hospital fully till I tried it. Those large rooms with the fire going and the windows closed (weather has been cool), were as sweet and clean as a drawing-room; indeed there are few rooms in this town with such a delightful air in *them*.

Yours,

W. D. MIDDLETON.

STELLAPOLIS, IOWA, June 22, 1882.

Dear Sir—Dr. Jones wishes me to be his amanuensis to inform you that he has been treating a case of confluent small-pox. One of modified small-pox in the same family, and has four cases in another family of the variola in a modified form.

Respectfully,

W. R. EMIES, M. D.

DES MOINES, July 17, 1882.

DR. W. S. ROBERTSON, *President Iowa State Board of Health, Muscatine, Iowa:*

Dear Doctor—After consultation with Dr. Dickinson, the inclosed remonstrance to Senators and Representatives in Congress is drawn up, and copies forwarded to you for your signature.

Will you have the kindness to forward these as soon as possible? As the matter has passed the House, our only hope is to have the amount of the appropriation sufficiently increased in the Senate, and thus sent back to the House, where it may be concurred in. It seems a shame that a scheme so eminently beneficial as the recently inaugurated system of immigrant inspection, should fail for the lack of a few thousand dollars, at the hands of a Congress who are spending millions on some objects of, to say the least, very doubtful utility.

Yours truly,

R. J. FARQUHARSON.

IOWA STATE BOARD OF HEALTH,
DES MOINES, July 17, 1882.

To Iowa Senators and Representatives in Congress:

Small-pox has been, during the past six months, and is being repeatedly introduced into this State by immigrants from infected places, and by persons coming in contact with such immigrants. It has appeared in over forty different localities in Iowa, and in nearly every instance is traced to foreign

immigrants. By reason of such introduction of this disease, the death-rate, sickness and pauperism is largely increased, disaster and suffering produced, and the lives and health of the people greatly endangered. The State Board of Health and local boards have found it impossible to prevent or control the introduction of this disease into this State. So rapid is the transit, a person may come from a foreign infected district to Iowa during the incubation period of the disease. With the national government alone rests the power to provide the adequate and necessary protection from this scourge. It is, therefore, with the deepest regret the State Board of Health of Iowa learns that the work begun by the National Board of Health, in this direction, and which has the hearty indorsement and co-operation of the Iowa State Board, will be rendered nugatory by reason of want of funds. The present is a most unfortunate and inopportune time to cripple the efforts being made by the National Board and State Boards in the West, to prevent and control the spread of small-pox.

The State Board of Iowa, therefore, most earnestly requests you, as the representatives of the people, to use your utmost efforts to secure such provision as will enable the National Board of Health to continue the immigration inspection at ports of entry and on main routes of travel, to the end that the people, not only of Iowa, but the whole country, may be protected from this devastating scourge.

On behalf of Iowa State Board of Health.

President.

R. J. FARQUHARSON, *Secretary.*

ALTON P. O., SIOUX COUNTY, IOWA, August 12, 1882.

STATE BOARD OF HEALTH, *Des Moines, Iowa:*

Gentlemen—I have been requested by many of the prominent citizens of this place, and of Orange City, to make a report to your honorable Board of the condition of the small-pox contagion in Orange City and vicinity, and of the means that are being employed to prevent its spread; and to urge your immediate action in the matter, for the protection of those who are willing, but powerless, to put in force proper measures to eradicate it from the neighborhood. The first cases of small-pox in Orange City broke out in the family of G. H. Haverkaup, in May, and were pronounced by the health physician of that town *chicken-pox*. The patients were allowed to run at large. Everybody was allowed to run in and out of the house, and not until the citizens insisted upon calling a physician from another town was it made publicly known that the disease was small-pox. Then very loose quarantine regulations were adopted by the trustees; guards were appointed to the infected houses, but were very slack in their duty, and the disease was allowed to spread, until now we hear of new cases every few days. Vaccination is absolutely refused, many of the Hollanders, if not nearly all, being fatalists, and claiming that if they are destined to have small-pox they will have it, whether precautions are taken or not. There has been no hospital established. Clothing upon which small-pox patients have died is hung

out on the clothes lines near other and adjacent buildings, without being disinfected or any measures being taken to cleanse them. The trustees, or Board of Health, of the town have this same abominable superstition, and refuse to adopt rigid measures to prevent the spread of the disease, and we are utterly powerless to protect ourselves. We fear that unless your honorable Board see fit to interfere and put in force such measures as will effectually isolate all that are now suffering from the disease, and all that have been exposed, that we will not get rid of it until cold weather sets in, when there is no doubt but it will spread through this whole region of country, and possibly become epidemic. We earnestly hope, for the good of the public and for the safety and welfare of the State, that you will give this matter your immediate attention. For corroboration of the statements made here I refer you to Charles Lewis, of the firm of Pierce & Lewis, Orange City.

If you desire to know anything as regards my standing, I would cheerfully refer you to Governor Sherman, or to Secretary Hull. Both of these gentlemen know me personally as a member of the House in the Eighteenth General Assembly.

Very respectfully yours,

A. L. BEACH.

STATE BOARD OF HEALTH,
DES MOINES, August 16, 1882.

HON. A. L. BEACH, *Alton, Sioux county, Iowa:*

Dear Sir—Your kind favor of the 12th instant came duly to hand.

According to the present law, the Iowa State Board of Health has only advisory powers, and can act only through the local boards of health. When these neglect or refuse to do their duty, they are liable to an indictment for a misdemeanor, according to the following expressed opinion of the Attorney-General:

"I have no doubt but a city, town, or township officer could be indicted for a misdemeanor, and section 3965 of the Code of 1873, is the one under which an indictment could be found for a refusal to obey this law. Section 13, chapter 151, laws of 1880, when viewed alone would seem to be a statute directory in character, but when considered in connection with other sections, I am of the opinion that it is mandatory."

But before going to law, perhaps it might be advisable to try milder measures.

First. In regard to the protection of the community. A complete protection is only possible from a thorough and systematic vaccination of every one. This in a sparsely settled county like Sioux county could be made by a very moderate expenditure of time, labor, and money.

Second. In regard to the refractory Hollanders. How to get them vaccinated, and also to get them to adopt other sanitary measures is, I must confess, a most difficult problem to solve. Though in various parts of the State all children attending the public or other schools, have been vaccinated

by order of a board of health, and again all assemblages of unvaccinated persons in churches, theatres, etc., have been forbidden, yet no compulsory vaccination of a whole community, nor of any unwilling adults has been attempted. In Chicago the Poles and Bohemians obstinately and successfully resisted all efforts for their vaccination, when small-pox was prevailing among them, until the aid of the priests was enlisted in the matter, when they readily yielded and were vaccinated by hundreds in the churches; this resulting in an almost total elimination of small-pox.

I presume the Hollanders are Protestants and could be influenced by their clergyman. The effort is worthy of a trial, any way; if it failed, the rest of the community, being protected by vaccination, the refractory ones should be quarantined until they had passed through the ordeal of the disease by death or otherwise.

Yours truly,

R. J. FARQUHARSON.
Secretary State Board of Health.

OFFICE OF SUPERVISING SURGEON-GENERAL,
UNITED STATES MARINE-HOSPITAL SERVICE,
WASHINGTON, D. C., August 9, 1882.

To medical officers of the marine-hospital service and officers of State and municipal boards of health:

I am directed by the Secretary of the Treasury to inform you that Congress at its last session enacted that:

"The President of the United States is hereby authorized, in case of a threatened or actual epidemic, to use a sum not exceeding one hundred thousand dollars out of any money in the treasury not otherwise appropriated, in aid of State and local boards, or otherwise, in his discretion, in preventing and suppressing the spread of the same."

He further directs me to inform you that the President has decided to employ this contingent appropriation, through the agency of the treasury department, and that, in case of a threatened or actual epidemic, immediate action will be taken, upon application from the Governor of a State addressed to the Secretary of the Treasury.

JOHN B. HAMILTON,
Supervising Surg.-Gen. U. S. Marine-Hospital Service.

SPRINGFIELD, ILL., October 7, 1882.

R. J. FARQUHARSON, M. D.:

Dear Doctor—Will you please send me the number of times small-pox was introduced into your State by immigrants during the eighteen months preceding July, 1882.

Very truly yours,

JOHN H. RAUCH, M. D., *Secretary.*

STATE BOARD OF HEALTH,
October 10, 1882.

DR. J. H. RAUCH, *Secretary Illinois State Board of Health, Springfield, Illinois:*

Dear Doctor—Your kind favor of the 7th instant to hand. I am sorry not to be able to give you any definite information in regard to the number of times small-pox has been introduced into Iowa by immigrants.

Health officers and correspondents have failed entirely in keeping this office informed as to the history of the various attacks of that disease. I am satisfied that most of these outbreaks were due to immigrants.

Yours truly,

R. J. FARQUHARSON, M. D.,
Secretary.

IOWA STATE BOARD OF HEALTH,
October, 26, 1882.

DR. A. W. CANTWELL, H. O., *Davenport, Iowa:*

Dear Doctor—In my report of next week I wish to make use of the information you gave me verbally at Indianapolis. Will you have the kindness to give me answers in writing to the following questions, viz.:

1. How many cases of small-pox altogether?
2. How many deaths?
3. Of the cases of small-pox how many had been previously vaccinated?
4. Of the deaths how many vaccinated?
5. What was the total cost of the outbreak?
6. Did the city bear the whole expense.
7. If not, how was it shared between city and county?
8. What was the greatest number of cases of small-pox in the hospital at any one time, and what was the state of ventilation at that time?

Yours truly,

R. J. FARQUHARSON.

DAVENPORT, IOWA, October 28, 1882.

DR. R. J. FARQUHARSON, *Secretary Iowa State Board of Health:*

Dear Doctor—I will try to answer your questions:

1. Total number from April 19	71
During last winter	4
Total since last October, 1881	75
2. Number of deaths	11
3. Had been vaccinated	2

One of these died of pneumonia. Three days after entering hospital had varioloid very light; was taken from a basement that was damp to the hospital. His age was seventy-three years.

The other was a lady whose disease was not recognized at first, which assumed a congestive form, and died of hemorrhage. Her age was forty-two years.

Thirty-two had never been vaccinated. Three of these cases were modified. Twenty-nine vaccinated in infancy. Three of these had small-pox. The other ten were children under ten years of age.

5. The extra cost was about fifty-two hundred dollars ($5,200). The county paid all the expense, and of those who were not able to pay.

6. The city paid the expense of quarantine, as that was considered police duty, also the health officer.

7. The greatest number of sick in hospital was fifteen, and at the same time eleven (11) well persons. The ventilation seemed good through the entire seige. Had fire in grates every day. The first cases went to the hospital May 18. Hospital closed September 4.

During this time forty-three persons who had been exposed were sent there, who were in infected houses; not one of these contracted the disease. We also had in quarantine during the three months, lowest number seven (7); highest, one hundred and sixty-seven (167). During the months of June and July we had daily sessions of our board of health. Since then our regular meetings each Saturday at 4 P. M. The meetings have been well attended.

Hoping this will give you the desired information, I am

Respectfully yours,

A. W. CANTWELL.

EARTH CLOSETS.

DAVENPORT, IOWA, September 7, 1882.

DR. FARQUHARSON, *Des Moines, Iowa:*

Dear Sir—I write you to ask advise in the matter of earth closets. I want two or three for use in our hospital. What is the best kind made? What are the prices asked? Where are they made? Would you advise using them? Any suggestions you would choose to make will be gladly received. I know that you at one time looked up the matter quite thoroughly. Do you consider the earth closet held at too high a price? Would you give me your ideas as to what sized one is needed here? I thought that probably we could get along with the smaller size. We are all well and prospering.

Yours respectfully,

S. W. PIERCE.

The copy of the answer to this has been mislaid, but was in substance, as follows, viz.:

1. In the absence of an abundant water supply, and complete drainage, would recommend the use of the earth closets.

2. The "Wakefield Earth Closet" is the best made.

3. Price of the common ones, $15.

4. Good dry loam collected in the summer or autumn, is the best to use; but a supply of this failing, coal ashes, especially from hard coal, is a substitute.

5. No earth closet is in any proper sense "automatic" but requires constant watchfulness and care.

MORTALITY FROM CONSUMPTION.

NEW YORK, October 1, 1882.

SECRETARY STATE BOARD OF HEALTH:

Dear Sir—Will you kindly inform me of the total number of deaths reported as occurring from pulmonary consumption in your State for any one year; 1881, if possible.

The figures are to be used in demonstrating the necessity of a State hospital for pauper consumptives.

Truly yours,

J. HILGARD TYNDALE, M. D.

31 East Twenty-second street.

IOWA STATE BOARD OF HEALTH,
DES MOINES, September 20, 1882.

DR. J. HILGARD TYNDALE, *31 East Twenty-second street, New York city:*

Dear Doctor—Your kind favor of the first proximo came duly to hand. The first compilation of deaths for this State, which is for the year ending October 1, 1881, is now in progress. The deaths by consumption for the first fourteen counties, taken alphabetically, with a population, according to the United States census of 1880, of 209,502, amounted to one hundred and four, which for the whole State would give a total of eight hundred and eleven.

Taking the State of Massachusetts for nearly the same period (1880), we have a mortality from consumption of 5,994 out of a total mortality of 36,589, being in the proportion of 16 per cent, while Iowa gives a mortality of 811 from consumption out of a total mortality of 10,627, being in the proportion of 7.6 per cent. Now, though it is probable that not more than one third of the deaths in Iowa were reported, yet as the deficit of reports would equally affect all causes of deaths, this fact would not invalidate the above statement of the comparative mortality from consumption in Iowa and Massachusetts.

Yours truly,

R. J. FARQUHARSON,
Secretary.

IMPURE WATER AT FORT DODGE.

FORT DODGE, Iowa, July 3, 1882.

SECRETARY STATE BOARD OF HEALTH, *Des Moines, Iowa:*

Dear Sir—I have recently called in question the safety of the water from our water-works for potable purposes, and Hirsch's test demonstrates a large amount of organic substance in suspension, and the source of the supply gives warrant to such a conclusion. The source of the supply is from the Des Moines river, and is taken a few feet *below* the mouth of Soldier creek, which creek is the natural and only sewer of the north third of our city (population 5,000). A quarter of a mile above its mouth are several filthy hog and cattle yards, used by stock shippers, also a large brewery. One mile above its mouth two principal cemeteries are located on its bank.

Can you afford facilities for a more complete analysis of this water than yielded by the Hirsch test?

Respectfully,

T. NICHOLS, M. D.

The reply was made by Dr. W. H. Dickinson.

DISTRIBUTION OF THE REPORT.

Since my last report the distribution of reports has been continued, and according to the law they were first sent to clerks of local boards of health; second to the health officers of townships, and third to health officers of towns and cities.

Copies were also sent to the different State Boards of Health, and also to those cities from which this office had received reports.

Total number of copies printed	5,000
Distributed	2,138
On hand	2,862
Of these are bound	1,302
Unbound	1,560
	2,862
Belonging to Secretary of State	500
Total belonging to State Board	2,362

BUSINESS OF SECRETARY'S OFFICE.

The current business of this office has more than doubled during the year.

The prevalence of small-pox throughout the State, caused largely increased inquiry, both by clerks and health officers of local boards for information, as to what to do, and how to do it.

These inquiries have been answered as far as possible by pamphlets or circulars on the subject. But the Board would scarcely believe the number of inquiries which come from the rural districts relative to sanitary matters. The local officers do not seem to comprehend the rules of the State Board, and constant inquiries are being made to this office, all requiring long and detailed explanations.

Again, when action has been taken by a local board, where expenses are incurred, there comes then to this office the inquiry how these expenses are to be paid. The law on this point seems to be either doubtful or defective, and the matter has to be settled by the courts.

It should be borne in mind that there are over sixteen hundred (1,600) townships in the State, and nearly one thousand incorporated cities and towns, from most of which are constantly being received inquiries necessitating correspondence. There are also nearly one thousand local boards of health organized, each with a health officer, and nearly one hundred special correspondents.

To all clerks and health officers of local boards are sent blanks, circulars, etc., requiring the folding, addressing, and stamping the same. County clerks have to be supplied annually with thousands of blanks, which have to be properly folded and packed for delivery by mail or express.

This distribution is attended with much additional correspondence, so that the time of one person is almost entirely occupied with the distribution and reception of blanks, and the attendant correspondence. If the rate of increase of last year continues, it will soon be beyond the ability of one person to handle this part of the business of the office.

LIBRARY.

In addition to the constant increase by exchange, over one hundred volumes, at a cost of $93.85, have been purchased, in accordance with the resolution of the May meeting, which directed that "five hundred dollars be appropriated from the Board fund for the purchase of a nucleus of a library."

If this is construed to mean five hundred dollars from the annual appropriation it is more than that appropriation will bear, taking into consideration the other necessary expenses. Nor is such a sudden expenditure needed for the library. It would be all the better if the books were more deliberately purchased, especially from the fact that many valuable and standard works are now out of print, and must necessarily be picked from various sources, if obtained at all.

The library now contains over three hundred volumes, exclusive of reports of State Boards of Health, and of pamphlets. The titles of all the bound volumes and pamphlets are entered in a catalogue, arranged according to subjects, and prepared by Mr. Andrews.

INSTRUMENTS.

An addition to our small stock of instruments was made by the purchase of an oil-tester. This is the one used by the inspectors in New York State, and was selected by a special committee of the analysts of the New York State Board of Health, after a comparative trial of all sorts of instruments. It is the so-called Wisconsin oil-tester, with some modifications suggested by the experience of the New York analysts. This instrument was devised by Dr. Kedzie, and was first described by him in the first annual report of the Michigan State Board of Health, for 1873. The New York tester was bought as being the best of its kind, and that from experience we might become familiar with its operation, and more capable of advising future legislation, which is so much needed in this State, to procure proper inspection of illuminating oils. A maximum and a minimum theremometer are needed to complete our meteorological apparatus.

SANITARY TOPOGRAPHY.

I have purchased a set of county maps which were left over in the hands of Mills & Co., after printing Andreas' Illustrated Historical Atlas of Iowa; also a copy of that work.

My object in getting these county maps was a desire to make the attempt, by distributing them among the various counties, to establish the connection, if any, that exists between the distribution of certain diseases, as cerebro-spinal meningitis and diphtheria, and the topography or physical geography of the State. The idea was to place a map of each county in the hands of some competent person in that county, to be kept by him for one or two years from the first day of next January. On this map should be recorded all cases of cerebro-spinal meningitis and diphtheria, as nearly as possible in the site of their occurrence, diphtheria to be designated by a circle—thus, O; and cerebro-spinal meningitis by a plus sign, +. The number of cases being designated by Arabic numerals in black ink, and the number of death by Arabic numerals in red ink, placed near these symbols. Of course, as it is desired, not to record the individual experience of the observer, but approximately all the cases in the county, it would be necessary for the person holding the map to endeavor, by all means in his power, by conferences at the meetings of the county medical

societies, and by information derived from his brother physicians to make the record as full as possible.

This scheme is submitted to the Board for some advice and suggestions as to how to get it into working shape. Your attention is invited to the following circular on this subject:

TRENTON, N. J., February 15, 1882.

The observations of sanitarians in other countries and in a few of our States have led to the belief that the occurence and the fatality of many diseases depends much upon geological structure, soil, topography, elevation, and exposure, rainfall, relations to seas and other bodies of water, density of population, and other local conditions not determined by the latitude or longitude of the locality. Thus districts, or even small precincts, have their climate, which bears relations to the vitality of the people and governs the causes and courses of disease. It is for this reason that sanitary survey and topography have attracted the attention of the National Government, and may well concern a State which presents diversities already so recognized by common observation as to have led to preferences and selections of resorts in adaptation to different kinds and phases of diseases.

While these general observations are valuable, it is only by the close and confirmatory observations of experts and the tabulation of closely noted facts that we arrive at well sustained conclusions. It is fortunate for this State that its geology and topography are so well mapped as to afford an excellent basis for this kind of observation. After a conference with Prof. George H. Cook, the State Geologist, this board found it feasible to supply at original cost a sufficient number of maps to a sufficient number of observers, to make this kind of observation practicable. It is proposed in connection with medical societies or individual observers of the State, to place this map in the hands of some chosen observer, who, up to the year 1885, will collect from the township or city in which he resides, such data as shall enable him to estimate the relation of his particular locality to disease. The areas chosen will be townships and cities, and, of the larger cities, wards or some more natural divisions, with a map of reference pointing out relation of each locality, with the facts from time to time furnished by our reports and vital and meteorological data, we shall hope to give fixedness of attention and uniformity of system to the observations. Much will depend upon the choice of an observer who is painstaking, and who has some skill in accurate methods of observation.

He would first study with care the locality with which he has to deal in all its tellurial conditions. He would inquire how it varies as to degrees and moisture, how far the wells and river beds indicate its usual and varying water level; how the relations of valleys, hills, and bodies of water effect the degree of heat it receives, and how prevailing winds indicate its local changes or result from its adjacent relations.

He would seek from the assessor, or city clerk, the deaths in the district, with age, date, and place of residence, in order to see whether for these years the relations of these to the general or precise locality could be discovered, and note explanatory views. To some degree, as in rheumatism or consumption, he would seek to know how far locality produced or influenced the progress of the malady. If a part of his township or ward had marked diversity from that in which he lived, or over which he rode, he would select some careful observer to afford such information as appertained to his valley or hill, or water front. Often a few questions at the meetings of medical men would aid to give precision, in place of the casual expressions too apt to be accepted from a very few cases. The laws of locality thus become informatory as to disease. If, for instance, every house in a township could give the history of every case of disease that has occurred in it the last fifty years, and one skilled in etiology and classification could handle the data, he would come to know what significance to give to cases, and learn from them to unriddle causes far better if he can be a living witness and investigator, and so have sources for comparing and correcting observations. Thus not only the records of death, but of disease and the personal experience of local practitioners is secured. A map can be had by each President, or reporter of a county or city society, as the property of the society, in order that views may be compared. A physician who has lived and practiced many years in one locality, and whose note-books can remind him with exactness of cases and circumstances, has really very much information as to climatic or other local causes which he can give, and which ought not to die with him.

Short notes made at the end of each month, as to its characteristics and diseases, and summed up at the end of each year, would aid much in the final summary. So soon as a full list of observers is secured, a very brief yearly report will be asked, so as to assure a full return at the end of the period. For the small expense incurred in correspondence, it is hoped provision will be made. As localities and the methods of individual observers are so diverse, no precise form will be given unless asked for. The design is rather to get the mature judgment of the observer, formed in his own way, except that it should depend upon the careful study and analysis of closely noted facts, and be formed on expert and continued investigations and reflections. It should be the observations of precise methods rather than the promiscuous methods of unskilled observers. We hope by the time of the semi-decennial census to be able to get a sufficient number of data to give valuable guidance. The effort is to get, in connection with vital returns, the personal testimony of some competent observer. That experience is most valuable which either by statistical or other methods classifies knowledge, and so has breadth of view and system of analysis in making conclusions.

When the physicians of any locality come to study accurately the deaths of each year, the diseases of each year, to compare vital statistics with their own observations; when they acquire the habit of being observers on a sys-

tem to such a degree that their conclusions are arrived at, not as hasty generalizations, or from a few recent cases, but as a record of an analyzed experience, we always secure most valuable facts as to public health and the prevention of disease. Carefully collected statistics and carefully collated experience are the two factors of information upon which the State care of the health of the population must rely. We, therefore, ask societies and individuals to aid in this work, and all the more, because it is not less vital to the progress and success of medical science and art than to its social and sanitary progress. Any physician who thus on a system files away his observations each three or six months will have no difficulty at the close of each year, or at longer periods, in furnishing valuable data as to the diseases of his locality, and suspected impairments to the general health.

By order of the Board.

EZRA M. HUNT, M. D.,
Secretary New Jersey State Board of Health.

FINANCIAL.

The expenditure for seven months has been $2,417.09, or at the rate of $345.00 per month; if the expenses of the office were continued at that rate for the remaining five months of the fiscal year it would amount to $1,725.00, making a total for the year of $4,142.00, leaving a balance of the yearly appropriation amounting to $848.

But as two items of expense will not recur this year, viz.: postage $200, and printing $400, the balance at the current rate of expenditure would be $1,458.

SMALL-POX OUTBREAKS.

In the past semestre information, mostly of a somewhat informal character, has reached this office of three outbreaks of small-pox, one in Scott county, as announced by Dr. Cantwell in letter of correspondence already read; one in Iowa county, in letter from Dr. Jones, of Stellapolis; and one in Sioux county, in letter from Hon. A. L. Beach, of Alton.

In regard to the former, which appears to have been the most important, I addressed the following letter to Dr. Cantwell, health officer of Davenport, and received the following answer, the contents of which may be considered or tabulated as follows, viz.:

Number of cases of small-pox since April 17, 1882	71
Number of deaths	11
Percentage deaths (in 71 cases)	00.15+
Of 71 cases, there were previously vaccinated	39
Of 71 cases, there were not previously vaccinated	32

Number of deaths among previously vaccinated	2
Making for the 39 vaccinated a mortality of	00.05+
Number of deaths among those not vaccinated	9
Giving for the 32 unvaccinated a mortality of	00.28+

Of the two deaths among the vaccinated, one was forty-two years and the other seventy-three years.

Of the thirty-nine cases of vaccinated persons, twenty-nine were adults and ten were children under ten years of age.

As the two deaths among the vaccinated were both of them adults, it follows that none of the vaccinated children died, which is of itself a remarkable fact, and shows how completely vaccination has reversed the ordinary course of disease, in the unmodified disease the greatest mortality being among children under five years of age.

The total cost of the outbreak was $5,200. Of this the city of Davenport paid the cost of quarantining the well persons, this being regarded as a police matter; the balance was paid by the county of Scott.

The small-pox hospital was opened on May 18th and closed September 4th.

The greatest number of cases of small-pox in the wards at any one time was fifteen; greatest number of well persons, eleven.

"*The ventilation seemed good throughout the entire siege.*" Fires were burned in the grates every day, although the weather was quite warm. Forty-three well persons were sent to the hospital from infected houses, and of these not one contracted the disease.

During three months, the smallest number of persons quarantined was seven, and the greatest, one hundred and sixty-seven.

Total number of cases treated in hospital	36
Total number of cases treated elsewhere	35
Number of deaths in hospital=6, being .16+ of 36 cases	
Number of deaths elsewhere=5, being .14+ of 35 cases	
Of the 36 cases in hospital there were under 10 years	11
Over 10 years	25
Total	36
Of the 35 cases elsewhere, there were under 10 years	6
Over 10 years	29
Total	35

Of the 6 deaths in hospital, there were under 10 years	1
There were over 10 years	5
Total	6
Of the 5 deaths elsewhere there were under 10 years	1
There were over 10 years	4
Total	5

On motion, the report of the Secretary was accepted.

On motion of Dr. Dickinson, it was ordered that section two of the by-laws be amended so as to read as follows, to-wit:

"That as to the Secretary, that his annual election shall be discontinued: that he hold his office during the pleasure of the Board; and that he may be removed for incompetency or other cause, at any meeting, by the votes of a majority of the Board."

Dr. Dickinson presented the following resolution, which was adopted, and the Secretary instructed to send a copy to Iowa Congressmen:

Resolved, That the Iowa State Board of Health cordially approves the action of the National Board of Health, by the American Public Health Association at its recent meeting in Indianapolis, both in regard to the protection of the Mississippi Valley from yellow fever, and the northwest from small-pox; also

Resolved, That this Board, while grateful for the protection from small-pox, afforded this State, by the inspection of immigrants at ports of entry, and while in transit on the railroads, deeply regrets the action of Congress which, by a deficient appropriation, crippled this efficient means of protection, thereby exposing Iowa and the whole northwest to great danger.

On motion the Secretary was ordered to prepare a petition to Congress, to keep the library of the Surgeon-General's office separate from the congressional library, and in a fire-proof building.

On motion it was ordered that the salary of Mr. Andrews be fixed at one thousand dollars per annum, as assistant secretary.

Dr. Dickinson presented the following resolution which was adopted:

Resolved, That this State Board of Health recommends to local boards of health, and trustees of public schools throughout the State, the compulsory vaccination of all unprotected children attending the schools, on the outbreak of epidemic small-pox in the neighborhood.

On motion bills and vouchers from number 233 to 247 inclusive, amounting to $515.18 were audited and ordered paid.

On motion the computation of expenses of the Board meeting was made as follows:

Dr. Robertson	$ 20.00
Dr. Dickinson	5.00
Dr. Olney	15.00
Dr. Hull	28.00
Dr. Lewellen	30.00
Dr. Reynolds	23.00
Dr. Clark	43.00
J. L. Loring, C. E.	10.00
Total	$174.00

On motion the Board adjourned to meet at Des Moines the first Wednesday in May, 1883.

PROCEEDINGS OF MAY MEETING, 1883.

DES MOINES, THURSDAY, May 3, 1883.

Pursuant to call, by order of the President, the Board convened at the office of the Secretary, and was called to order at 9 o'clock A. M.

All members present except Dr. Clark.

The minutes of the last meeting were read and approved.

On motion, it was ordered that the petition to Congress in regard to the Library of the Surgeon-General's Office be renewed.

Mr. Loring presented the following resolution, which was adopted:

Resolved, That the Secretary of the State Board of Health prepare a circular addressed to the members of Congress from Iowa, requesting their influence in urging upon Congress an appropriation for the construction of a fire-proof building in the city of Washington, wherein to place the Medical Museum now in the old Ford Theater.

On motion of Dr. Lewellen, the Secretary was instructed to prepare for general distribution, a circular upon the cause and prevention of Typhoid Fever.

On motion, the New York kerosene oil tester as adopted by the New York State Board of Health was adopted as the standard oil tester for the State of Iowa.

On motion, a resolution adopted by the Board at a former meeting, regarding the distribution of the biennial report of the Board, was rescinded.

On motion of Dr. Lewellen, Mr. L. F. Andrews, was continued as Assistant Secretary until further ordered, at the same salary.

The Secretary presented his report, which was accepted, as follows:

REPORT OF THE SECRETARY.

As another meeting is to take place previous to the meeting of the next Legislature, all questions of proposed amendment to the existing law may be postponed, but I beg leave to suggest that the Committee on Legislation be requested to consider this matter, and have prepared to lay before the Board at the November meeting a draft of what is needed in the way of amendments.

The current business of this office has continued to increase, as new Local Boards of Health spring into existence. This necessitates additional correspondence and more distribution of blanks, circulars, and other documents.

The total number of Local Boards of Health up to date is 450; of which there are in cities or incorporated towns 133; in townships 317.

VITAL STATISTICS.

The work of compiling the vital statistics for the year ending October 1, 1881, is steadily progressing, and is sufficiently advanced to render it reasonably certain that it will be finished by the time the new law (chapter 175, Laws of 1882) requires reports of State institutions to be in the hands of the public printer, which is the 30th day of June.

The compilation of the statistics of the marriages, births, and still-births are now completed; the compilation of the deaths, giving sex, color, age, months according to an alphabetical list of diseases is also finished.

There remains to be compiled, another table showing deaths by counties, sex, social condition, and color, according to a list of causes of death nosologically arranged. In compiling this, the new classification of causes of death which was exhibited at the meeting of May, 1882, will be used. This classification is the result of a modification of the English official one, and as it will in all probability be adopted in this country, it is used, so that our series of vital statistics may in this respect, be uniform from the beginning. A table compiled from the preceding will show the same by the nine great divisions of the State Another comparing the mortality from a number of selected diseases in the various divisions of the State will complete the work.

LITERARY.

In obedience to the resolutions of May, 1882, in regard to the library, the purchase of books has been continued according as opportunity of obtaining suitable works occurred, until at present we have in the library 460 books, not including State reports, pamphlets, and unbound volumes.

EXPENDITURES.

The total expenditures up to date have been $521.29, from which deduct $35.95 for books bought previously to the above resolution, and we have expended for books under that resolution $485.34.

SMALL-POX.

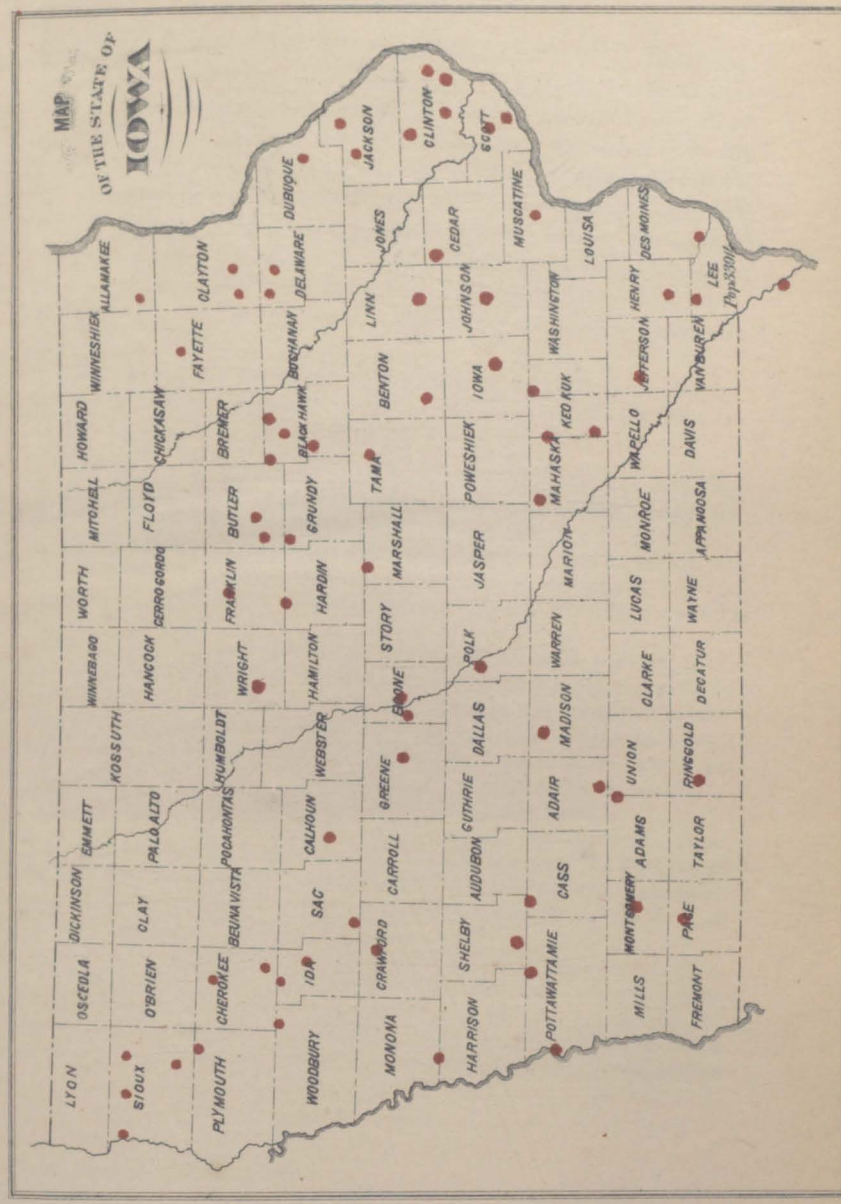
Since January 1, 1883, this disease has appeared in the following points in Iowa, the information coming from notices in the newspapers mostly.

January 1, Scott county, Davenport.
January 30, Ida county, Ida Grove.
February 1, Black Hawk county, Finchford.
February 20, Pottawattamie county, Council Bluffs.
March 1, Harrison county, Magnolia township.
March 17, Black Hawk county, Cedar Falls.
April 1, Mahaska county, Prairie township.
April 4, Franklin county, Mott township.
April 7, Madison county, Winterset (near).
April 18, Hardin county, Iowa Falls (near).

I would here respectfully suggest that the Secretary be authorized to print a circular for distribution throughout the State, directing health officers, where these exist, and in their absence any town or township authorities, to send short telegrams announcing the outbreak of small-pox, and the cost of these telegrams to be paid by the State Board of Health.

SANITARY COUNCIL OF MISSISSIPPI VALLEY.

A meeting of this body was held in Jackson, Mississippi, on April 3 and 4, 1883. On account of sickness, the Secretary was unable



to attend, but the Board was represented by Dr. W. H. Dickinson. This was a very important meeting, in view of the failure of Congress to provide for a continuation of the inspection service instituted by the National Board of Health; of the discussions between this Board and the State Board of Health; of the probable interruption of commerce this summer in consequence of these dissensions, should yellow fever make its usual appearance in New Orleans; of the want of confidence in the Lousiana State Board of Health by the other State Boards of Health in the valley of the Mississippi; and lastly, of the prolonged existence of a fatal form of *Cholera nostras* in some parts of Mexico.

Eleven States were represented, and a committee of one member from each State reported the following resolutions, which were adopted as the sense of the meeting:

WHEREAS, It is the sense of the Sanitary Council of the Mississippi valley that the National Board of Health possesses to the fullest extent the confidence of the States of the valley; it is, therefore,

Resolved, That a committee be appointed by the President of the Council to petition the President of the United States to place the $100,000 epidemic fund in the hands of the National Board of Health for disbursement, in case its use is demanded.

Resolved, That in case the National Board of Health is deprived of the power of making inspections of persons and freight, when demanded by the local boards of health, certificates issued under the supervision of a representative or reprepresentatives of the Sanitary Council of the Mississippi valley shall be accepted as valid by the boards of health of the Mississippi valley, provided that said inspection be carried on under the rules and regulations heretofore prescribed by the National Board of Health.

Resolved, That the Sanitary Council recommends that the States of the valley make voluntary contributions, to be expended under the direction of the Executive Committee of this Council, to continue river and rail inspections, in the event that no funds are placed in the hands of the National Board of Health for that purpose.

Resolved, That the Sanitary Council recommends for the guidance of health organizations of this valley, the system of inspection, isolation, disinfection and quarantine heretofore prescribed by the National Board of Health.

Resolved, That the communication of the Louisiana State Board of Health be received in the spirit in which it is tendered, and that its co-operation

with the Sanitary Council of the Mississippi valley, in protecting the valley from epidemic diseases, will be cordially approved and acknowledged.

All of which is respectfully submitted.

R. C. KEDZIE, *Ch'n.*
B. M. GRIFFITH.
W. H. DICKINSON.
JOS. SPIEGELHALTER.
G. B. THORNTON.
J. A. DIBBRELL, JR.
H. G. JONES.
W. T. HYER.
L. C. CARR.
W. W. DANIELLS.
D. C. HOLLIDAY, *Sec'y.*

The following draft of the memorial to the President of the United States, authorized at the morning session, was submitted by the committee:

To the President:

We, a committte appointed by the Sanitary Council of the Mississippi valley, at its fifth annual meeting, in the city of Jackson, Miss., April 3-4, 1883, do humbly but sincerely petition that the fund of $100,000, to be used, with your approval, in the event of an outbreak of yellow fever or other epidemic diseases on the coasts of our country, be placed at the disposal of the National Board of Health.

That body can give confidence to the people of the valley as to the necessary precautions and safeguards yearly demanded by the exposure of our Southern ports to the ravages of yellow fever. Their inspection stations and the mode their officers have adopted in isolation and disinfection, establishing quarantine only when emergency or occasion demands, have earned for the National Board a degree of confidence that, of itself alone, is worth millions of dollars to the commerce of the country.

To supplant this body, or withhold from it the necessary funds to maintain inspection stations at all exposed points, will, in our humble judgment, clog the wheels of commerce by bringing about a feeling of distrust on the first alarm, be it true or false, and cause recourse to the shot-gun policy of quarantine, which can but prove destructive to the commercial interests of the Mississippi valley, which, in a measure, affect those of the entire Union.

With these views, submitted with full faith in your judgment, and appreciation of the solicitude you must feel for the welfare of the public health, we herewith subscribe ourselves your most humble petitioners.

On motion, the draft of the memorial was approved, and it was ordered to be engrossed and signed by the delegates from the States of Ohio, Indiana, Illinois, Kentucky, Iowa, Tennessee, Missouri, Michigan, Wisconsin, Lousiana, Arkansas, and Mississippi, and to be forwarded to the President at Washington.

CORRESPONDENCE.

A letter has been received from H. Kato, President of Scientific Department, Tokio, Daigaku (University of Japan), Tokio, Japan, transmitting the 1st, 2d, and 3d Annual Reports of the Central Sanitary Bureau of the Home Department.

These volumes were read with a great deal of interest, giving as they do, the efforts of a foreign race to copy Europeans in the last great step in the progress of modern civilization—the care of the public health.

A steady advance has been made during the few years since the establishment of the Central Sanitary Bureau (June, 1873), as the following items show:

Registration of marriages, births, and deaths; registration of sickness (this is what no other country has ever attempted); establishment of a vaccine farm and compulsory vaccination; laws requiring the registration and examination of all physicians and apothecaries; also laws regulating the manufacture and sale of chemicals.

In looking over the tables of causes of death it is difficult to learn much, if anything, about individual diseases, for nearly all diseases are grouped in classes, and few are mentioned by name. Syphilis is however mentioned and furnishes a more notable percentage of the mortality than is usually found elsewhere.

It has been stated that "scarlatina and diphtheria are almost unknown, and never epidemic." No mention can be found of the former, but the opening paragraph of the chapter on "Infectious and Contagious Diseases" reads thus:

"Typhus and typhoid fevers, small-pox, dysenteria, and *diphtheria* are usually of a very malignant type, and are common in certain seasons of the year."

Upon the whole, it may be said that there is no such lack of the filth diseases as the tales of travelers would lead us to infer.

SMALL-POX ON A RAILROAD CAR.

IOWA STATE BOARD OF HEALTH,
DES MOINES, October 31 1881.

DR. HENRY B. BAKER, *Secretary Michigan State Board of Health, Lansing, Michigan:*

Dear Doctor—I an just now in the receipt of information, which goes far toward showing the wisdom of your idea that for the prevention of the dissemination of small-pox by railroads something more is required than the inspection and vaccination of passengers.

Last month a farmer, aged fifty years, left his home in Elkhart township in this (Polk) county, and after a ride in his wagon of six miles, took the cars on the C., R. I. & P. R. R. at Altoona, and rode to this city a distance of ten miles. Here he passed the night in a private family, there being no small-pox in the city at the time nor for a long time previous. Next day he returned home over the same route. After the usual period he broke out with small-pox, modified by vaccination, and from him his son and the hired girl had small-pox, being both unvaccinated. Now, on its main line to Council Bluffs *via* Des Moines, the C., R. I. &. P. R. R., does not run immigrant trains, but the immigrants are mixed up with the passengers. So that it appears altogether probable that this man must have contracted small-pox from an exposure in an *infected car* for a space of not over twenty minutes.

Yours truly,

R. J. FARQUHARSON,
Secretary.

ANALYSIS OF WATER AT MT. PLEASANT INSANE ASYLUM.

IOWA STATE BOARD OF HEALTH,
DES MOINES, November 29, 1881.

DR. H. A. GILMAN, *Superintendent Hospital for Insane, Mount Pleasant, Iowa:*

Dear Sir—Inclosed please find the results of the analysis of the water you sent. For comparison I have added the analysis of the waters of the Mississippi river at Davenport, and of the Raccoon at Des Moines. Through both the chlorine and nitrogen (as nitrites and nitrates) fall below the limit of danger laid down by Ekin (potable water) 3 parts of the former and .5 part to 100,000. Yet the marked excess of amminonia and albuminoid ammonia undoubtedly indicate the presence of such a quantity of organic matter, which if of animal (sewage) origin, would render the water highly suspicious, if not entirely to be rejected as a potable water.

Comparing the waters we have parts in 58.328 (U. S. gallon).

	H. M. M.	Ratio.	Al. Am.		Chlorine.	
Mount Pleasant	.0180	12	.0500	6	.67	9
Des Moines	.0015	1	.0075	1	.16	2
Davenport	.0051	3	.0176	2	.07	1

Yours truly,

R. J. FARQUHARSON,
Secretary.

THE LAW OF NUISANCE.

The following is an opinion delivered by Judge Richman in a nuisance case at Davenport, Iowa:

At the September term of the circuit court of Scott county, the case entitled *H. T. Bushnell et al. vs. E. D. Robeson et al.*, brought to secure the abatement of an alleged nuisance in the form of a slaughter-house out east of the Brady street road and in the plaintiff's neighborhood, as a nuisance, was on trial to the court and occupied several days. Bills & Block were counsel for the plaintiffs, and Davison & Lane for the defendants. Judge Richman took the case under advisement for decision during vacation, by consent of the parties.

The first clause in the decision refers to a motion to strike out of the petition of plaintiff certain averments that the slaughter-house in question was not in the right place; that the river bank was the proper place for such an establishment, and not a neighborhood where it might affect the health of the community. Thus much to render the understanding of the first paragraph of the decision clear to the general reader:

I. The motion to strike out is directed against the seventh and eighth sections of paragraph nine of the petition. As there are only three sections numbered, I can only guess at the matter sought to be eliminated, but presume it is the paragraphs relating to the effect of the supposed nuisance upon the increase of population, and the averment that there are other convenient places where the defendants' business may be properly carried on. I do not think these are material facts that need to be pleaded. The motion will therefore be sustained.

II. It is claimed by the defendants that the remedy for the abatement of a private nuisance provided by section 333 of the Code is exclusive, and that the case must be prosecuted by ordinary proceedings. Section 2508 provides that the plaintiff may prosecute his action by equitable proceedings in all cases when courts of equity, before the adoption of the Code had jurisdiction. Section 3386 provides that an injunction may be obtained as an independent remedy in an action by equitable proceedings, in all cases where such relief would have been granted in equity previous to the adoption of the Code. And then follows provision for an injunction in

ordinary proceedings to prevent the continuance of a breach of contract or other injury, etc. In the case of *Ewell vs. Greenwood*, 16 Iowa, 377, the Supreme Court directly asserts the right to relief in equity in such cases. See page 380. In accordance with these views, I hold that the plaintiffs might properly seek relief in a court of equity.

But even if this were a mistake, it does not authorize a dismissal of the case, as supposed by the defendants. Section 2514 provides that an error of this kind merely works a change into the proper forum and a transfer to the proper docket, The defendants might, by motion, have secured this change and transfer, if entitled thereto, at any time before filing their answre, under the provisions of section 2516 of the Code. But a failure to make such motion is a waiver of the error as to the kind of proceedings adopted. Code, section 2519. See, also, *Mills vs. Hamilton*, 49 Iowa, 105, and other cases cited in McClain's Code, pages 607-8.

III. I have considered the various objections made in argument by the defendants as to the sufficiency of the petition, and incline to think that while some of them at least might properly have been sustained on motion, yet, the defendants having answered the petition, and the evidence appearing to cover the matters objected to, and not being inconsistent with the case as stated, the plaintiffs, under our practice, are entitled to proceed with the trial under the somewhat general averments of the petition and the answer thereto, and establish their case if they can do so.

That they could properly join in asking the relief demanded is, I think, quite clearly established by the authorities: *Brunding vs. Harrison County et al.*, 50 Iowa, 164; *Robbins vs. S. G. Turnpike Company*, 34 Indiana, 461; *Powell vs. Spaulding*, 3 Greene, 443; *Brady vs. Week*, 3 Barbour, 157; *Robinson vs. Bungle*, 31 Michigan, 290 (directly in point); *Trustees vs. Corbin*, 4 Paige, 510; High on Injunctions, sections 757, 880, 1553 and cases cited; 3 Wait's Actions and Defenses, page 758.

IV. In regard to the plaintiff's supposed remedy at law, and compensation in damages, the rules now generally recognized are stated in 3 Waite's Actions and Defenses, pages 703, 704, and High on Injunctions, sections 772, 773, 774, 775, 777, and cases cited. In the present action, however, if the case is made out, it is obvious that damages cannot compensate, and that the injury is irreparable except by injunction and abatement of the nuisance. It is a constantly recurring grievance, affecting health and comfort, and not susceptible of pecuniary compensation. 3 Wait's Actions and Compensations, page 685; *Wilson vs. City of Mineral Point*, 39 Wisconsin, 160.

I also think that the plaintiffs allege and show special injury sustained by them as contradistinguished from the public at large, within the meaning of the law; and the fact that even many others are similarly affected will not defeat their right if established by the evidence. *Park vs. C. & S. W. R. R. Company*, 43 Iowa, 636; Wood's Law of Nuisances, section 647 and cases cited; *Ewell vs. Greenwood*, 26 Iowa, 377; *Francis vs. Scholkopf*, 12 New York, 152 (precisely in point).

V. It remains to consider briefly the evidence. Without going into details, or critically reviewing the evidence—which I cannot undertake to do without a transcript of it before me—I think it may be said that the plaintiffs' case is made out by a fair preponderance of the testimony. The evidence of plaintiffs' witnesses, as to offensive odors and their bad effect, is very strong and positive; and it is confirmed to some extent by a majority of the witnesses for the defendants, who, while modifying the statements of the plaintiffs' witnesses more or less; still admit the existence of such offensive odors at times coming under their observation. If, then, we consider the rule established by the greater weight of authority—that any use of property whatever in the existence of a trade or business which impregnates the atmosphere with noisome smells to the essential annoyance of others is a nuisance, and that slaughter-houses and kindred establishments in the immediate vicinity of populous communities are regarded as *prima facie* nuisances until the contrary is shown,—it would seem that the plaintiffs are entitled to the relief prayed. 4 Waits' Actions and Defenses, pages 751, 753 and cases cited.

It is not without reluctance that I arrive at a conclusion unfavorable to the prosecution of the large and lucrative business of the defendants in the locality where it is carried on; but having done so upon a full consideration of all the facts and circumstances, and the law applicable thereto, the duty is imposed upon me of pronouncing the judgment of the court. But in order to give time for a consideration of the proper limits and extent of such judgment by the court as well as the respective counsel, I will defer it until the first day of next term, to-wit, December 4, 1882.

D. C. RICHMAN,
Circuit Judge.

At Chambers, November 4, 1882.

The case will probably be taken to the Supreme Court.

THE DOCTORS AND THE LAW.

"Two prominent physicians in the city were tried before Justice Finger," says the Davenport *Democrat*, "for violating the ordinance and the rule of the Board of Health, which provided that physicians shall report all cases of contagious disease to the city clerk. All the physicians in Davenport have observed this rule, except these two—and they held that they could not be compelled to obey any such law, because there was no compensation for the trouble. Recently they have had nine cases of diphtheria, without reporting one. The neglect has been an aggravation to the health officers, for when the marshal would go to put his cards of warning on houses in which were patients afflicted with the disease, the people would complain that they were singled out, while their neighbors were not obliged to allow the cards to be placed on their homes. So Marshal Rumsey, who makes these statements, concluded he would settle the matter, once for all, and he lodged information against the two physicans.

When the defendants came into court, however, they pleaded guilty—and were fined one dollar each, with costs—paying $4.85 each. The justice let them off with light sentence, as this was the first charge against them.

The law which provides for the reporting of contagious diseases to the health office of a city was made for the protection and welfare of the community—it is a righteous law. It is akin to the law which provides for the registry of marriages, births, and deaths, though even more important to the city which adopts its provisions; and perhaps, in course of time, justices, ministers, and doctors may be allowed fees for making returns of these vital and mortuary occurrences; and until that time the duties to the public and the immediate community, made known in the law, must be performed without fee."

SMALL-POX EXPENSES.

GRAND JUNCTION, IOWA, January 31, 1883.

R. J. FARQUHARSON, M. D., *Des Moines, Iowa:*

Dear Doctor—I wrote you some time ago about collecting of bill for medical services rendered by order of the Board of Health. I enclose copy of bill, which will you please state whether or not you think it reasonable, and if it is made out in proper form for collecting. At the first meeting of the Board they refused to allow any of it, and at the second meeting they allowed $27, and at a called meeting on the 29th, they allowed $55. Now, you require of us certain duties, and we want to know how to get our pay. By answering by return mail you will greatly oblige,

Yours respectfully,

O. W. LOWRY.

[BILL.] GRAND JUNCTION, IOWA, Sept. 8, 1882.

THE COUNTY OF GREENE, *In account with O. W. Lowry, M. D.:*

To medical services rendered E. E. Kinsel, per order of Local Board of Health, July 16, 17, 18, 20, 23, 25, to six visits at pest-house, three miles in country, $7	$ 42.00
July 13, 14, 15, three visits, $16. To visits at Allen house, in town, same case, $5	25.00
July 17, to three visits at Allen house, attending cleaning and disinfecting, $2	6.00
July 18, two visits at Allen house, attending cleaning and disinfecting, $2	4.00
July 19, one visit at Allen house, attending cleaning and disinfecting	2.00
To vaccinating sixteen at Allen house, per order of Board	16.00
To vaccinating Cooper's family, per order of Board	4.00
	$ 99.00

Approved by H. L. Childs, President Local Board of Health.
Approved by C. C. Metzger, President Township Trustees, and member of Board of Health.
C. C. Metzger, Willard Mack, Trustees of Township.

STATE BOARD OF HEALTH,
DES MOINES, February 3, 1883.

DR. O. W. LOWRY, H. O., *Grand Junction, Greene county:*

Dear Doctor—Your kind favor of the 31st ultimo came duly to hand. The State Board of Health has neither judicial nor executive power. The only portion of chapter 151, Board of Health Act, applicable seems to be the final clause of section 15: "The local boards shall also regulate all fees and charges of persons employed by them in the execution of the health laws and of their own regulations." If the supervisors decline to pay the bill, your remedy is to sue the county. Individually, from my experience of what Scott county pays in such cases, your bill seems quite reasonable.

Yours truly,

R. J. FARQUHARSON,
Secretary.

SMALL-POX AT IDA GROVE.

IDA GROVE, IOWA, January 30, 1883.

R. J. FARQUHARSON, *Des Moines:*

Dear Sir—On the 28th instant a case of small-pox was discovered at one of our hotels, from which there has been considerable exposure. Shall not be surprised if several cases develop from it.

Have quarantined the house and removed the patient to pest-house.

Please write me your opinion as to length of time necessary to maintain quarantine. About twenty persons are confined to the hotel.

Very truly,

J. D. MILLER,
Health Officer.

DES MOINES, February 1, 1883.

DR. J. D. MILLER, H. O., *Ida Grove, Ida county:*

Dear Doctor—Yours of the 30th ultimo just to hand.

As small-pox has a period of incubation of at least fourteen days, and a prodromic period of four or more days, it would not be prudent to suspend quarantine or allow suspected persons to disperse in less time than three weeks. This is for the community at large. Those immediately exposed to danger of infection should be protected by vaccination, so repeated, that all doubt of susceptibility to small-pox or vaccina is removed.

Yours truly,

R. J. FARQUHARSON,
Secretary.

DISPOSAL OF A PEST-HOUSE.

GRAND JUNCTION, IOWA, February 9, 1883.

R. J. FARQUHARSON, M. D., *Des Moines, Iowa:*

Dear Doctor—What shall we do in the following case: The house we use as a pest-house cost $31. The board of supervisors allowed the party who furnished the lumber and put it up $18, and *the building* and *contents back again*, and they (the parties who furnished the lumber) have sold their interest in the building for $15. Now, the party who bought the building proposes to move it and contents into town. The building, chairs, stove, etc., are in it just as it was left when the man was discharged. I am unwilling to allow myself to be in the position of "health officer," under the existing circumstances.

Yours respectfully,

O. W. LOWRY.

STATE BOARD OF HEALTH,
DES MOINES, IOWA, February 10, 1883.

DR. O. W. LOWRY, H. O., *Grand Junction, Greene county:*

Dear Doctor—Your kind favor of the 9th inst. came duly to hand. In regard to the question submitted I would say:

1. Unless the building is needed for use as a pest-house in the near future the safest plan would be to burn it up with all its contents.

2. Another plan would be to burn up any bedding or clothing or rags left, and then to fumigate the building and contents with sulphur, using a large amount of this, and keeping the structure closed for several days, then opening it and expose freely to the air for a week or so before removing elsewhere.

Yours truly,

R. J. FARQUHARSON,
Secretary.

ANALYSIS OF THE WATER OF THE NEW WATER SUPPLY OF THE CITY OF DES MOINES.

AMES, IOWA, February 12, 1883.

R. J. FARQUHARSON, M. D., *Secretary of the State Board of Health, Des Moines, Iowa:*

Dear Sir—I find the water sent from the Des Moines Water Company to contain in one million parts:

		Per U. S. Gal.
Free ammonia	0.013	0.00075
Albuminoid ammonia	0.102	0.00590
Chlorine	15.8	0.921
Nitrogen as nitrates and nitrites	5.72	0.333
Residue on ignition	528.00	30.
Hardness	34.00	28

One degree of hardness is equal to one grain of carbonate of calcium or its equivalent in other salts in seventy thousand of water (Imperial gallon).

Yours respectfully,

PROF. T. E. POPE.

PUBLICATION OF BIRTHS, ETC.

DUBUQUE, March 7, 1883.

DR. R. J. FARQUHARSON, *Secretary State Board of Health, Des Moines:*

Dear Sir—A question of some interest has come up before the city council touching the records of the Board of Health, and I thought best to lay the matter before you. The circumstances are about as follows:

For some weeks one or two of our newspapers have been publishing the *names* of the parents of children born in Dubuque, according to the returns filed in the recorder's office.

I remonstrated with the present health officer, Dr. Connelly, urging that in many instances, as of illegitimate children and of those born before the lapse of the conventional nine months, matters were made public which were not legitimate public property—that if the practice was persisted in I should consider the matter of withholding all future returns of births. He agreed with me, and made an effort to have the publication of names stopped. But the ground was taken that the records of the Board of Health were public records, for the use of the public, and that it did not lie in the power of the mayor or council to prohibit inspection of them. A few days ago an illegitimate child was born in the city, and on the report "father unknown" was entered. This duly appeared as a local item in the Times, the name and address of the mother being given in full. Thereupon one of the physician's drew up a petition to the city council, asking them to see to it that reports of births—at least the names of parents—be in future regarded as confidential, and not furnished for publication. The matter came up in council, and the same discussion was referred to the committee of the whole. Before so doing, however, the ground was taken as above, viz., that the records were public and that the council had no right to refuse reporters access to them.

It occurred to me that if this matter had not already been adjudicated, an opinion from the Attorney-General, the *ex-officio* member of the State Board, might be valuable in the settlement of the question.

Will you kindly answer this as soon as you can get at the desired information, in order that it may be available when the committee meet.

Very truly,

JNO. S. LEWIS.

DES MOINES, March 12, 1883.

HON. S. MCPHERSON, *Attorney-General:*

Dear Sir—The within communication from Dubuque is respectfully referred to you for consideration and your opinion, if you deem it advisable to give it.

Perhaps, for a clearer understanding of the case, it would be better to state the following fact: In Dubuque the returns of marriages, births, and deaths, go first to the city recorder, and afterward by him to the clerk of the county. It is as to the publication of the former record of births that the question applies.

Yours truly,

R. J. FARQUHARSON,
Secretary.

RED OAK, March 17, 1883.

Dear Sir—I know of no reason in the world why the board of health reports and records are not open to public inspection. All records are, provided they are called for at proper times, and in proper way. I do not see how any public records should be closed to the public.

It may seem hard, and it is in some cases, but after all, it is a matter of judgment whether they make the publication.

Yours truly,

S. MCPHERSON,
Attorney General.

DR. R. J. FARQUHARSON,
Secretary Board of Health.

QUARANTINE OF PUBLIC SCHOOLS AGAINST SMALL-POX.

SIGOURNEY, IOWA, March 28, 1883.

DR. R. J. FARQUHARSON, *Des Moines, Iowa:*

Dear Sir—I herein enclose a "Proclamation issued by our Mayor in regard to the opening of our schools since our epidemic of 'scarlet fever.'"

I wish to state some facts concerning the proclamation, and then would like to have your opinion in regard to the matter.

At a regular meeting of the board of health March 8, 1883, the matter of opening the schools was discussed and the health officer, Dr. Price, was asked his opinion as to how long children should be kept from schools where the fever had prevailed. He said they could not give any time, that it should be left to the physician in attendance.

After the meeting had adjourned some members of the board, together with the mayor, thought it would not be safe to leave the matter in that shape, and as the State Board had recommended isolation for forty days, they issue the proclamation herein enclosed.

School opened on the 19th and three of our physicians, including the health officer, issued certificates to any and all who applied to them, regardless of the forty days clause.

I will send you a blank certificate which they would issue without any prevarication whatever.

Now, because I would not fill out these certificates as the balance of the physicians did, my patrons felt hard toward me for not so doing. I then appealed to the board for justice, either to release the forty days clause, or hold the balance of the physicians to the "proclamation."

Now the questions I wish to ask are: First, has the board the right to issue a proclamation of this kind outside of a regular meeting. Second, whose duty is it to commence action for violation of said "proclamation?"

There is no difference of opinion as to the right to prosecute, but whose duty is it? Now if it is not asking too much, I would like to have your opinion, if for nothing more than my own satisfaction.

Yours truly,

T. B. MCWILLIAMS.

PROCLAMATION.

By order of the Board of Health, I, J. J. Pollard, Mayor and Chairman of the Board of Health of Sigourney, do hereby announce and proclaim, that all places of public resort, except day schools and Sunday schools, which were closed by the Mayor's proclamation, of February 20, 1883, are permitted from this date to be thrown open as usual; and that day schools and Sunday schools will be permitted to assemble on and after Monday, March 19, unless otherwise ordered. But, as a precautionary measure, and in accordance with the direction of the State Board of Health, all children belonging to families in which there has been any scarlet fever, are required, before attending any of the schools or places of public resort, to procure a certificate from their physician, permitting their attendance. All physicians are hereby enjoined from issuing certificates to any children before forty days shall have elapsed since their last professional visit for the treatment of scarlet fever, to the family of such children. Persons whose families have been visited with the scarlet fever are cautioned to refrain from mingling with other people more than is absolutely necessary until the requisite forty days have elapsed.

By order of the Board of Health.

J. J. POLLARD,
Mayor and Chairman Board of Health.

A. J. POPE, *Recorder.*
March 8, 1883.

SIGOURNEY, IOWA, —, 1883.

I hereby certify that —— —— is entitled to attend school in accordance with the Mayor's proclamation of March 8, 1883.

——— ———, M. D.

DES MOINES, March 29, 1883.

DR. T. B. MCWILLIAMS, *Sigourney, Iowa.*

Dear Doctor—Yours of the 28th inst. came duly to hand.

1. The local board of health has at any time a right to pass and proclaim a regulation, provided a majority of members are present and vote for it.

2. There is no question of prosecution, the only penalty attached to a violation of the ordinance of a local board of health by section 16 (Board of Health Act) is the forfeiture of $20 per day; this is to be recovered by a civil action, and any party damaged may bring the action.

3. I have no doubt but that the health officer and others giving the certificates, thought they had done so, in accordance with the spirit, if not the letter, of the proclamation, for it is evident that for all children sick before

or at the time of the closing of the schools, thirty of the forty days of isolation prescribed by the State Board of Health would have been past at the time of the reopening of the schools.

Yours truly,

R. J. FARQUHARSON,
Secretary.

SMALL-POX IN MOTT TOWNSHIP, FRANKLIN COUNTY.

HAMPTON, FRANKLIN COUNTY, IOWA, April 3, 1883.

To the Honorable State Board of Health:

Gents—We have a case of small-pox in Mott township, of this county, and have confined it so far to one place. How long must they remain quarantined, and who is to be the judge? Who pays the expenses of the attending physicians, etc.? If you have printed rules and regulations, would be glad to get them.

Yours truly,

J. B. PECK.

DES MOINES, April 6, 1883.

DR. J. B. PECK, *Hampton, Franklin county, Iowa:*

Dear Sir—Copies of circulars of small-pox are sent to-day.

1. "How long must they be quarantined, and who is to be the judge?" The circular advises forty days isolation of all cases of small-pox. But those exposed to the contagion of small-pox need only be quarantined for twenty-one days; this after vaccination.

2. "Who pays the expenses of the attending physicians, etc.?" This is a matter as yet unsettled by the courts. In most cases the supervisors pay such bills, when properly made out by the township trustees and certified to by the local board of health; but in some cases they have refused to do so.

3. The local board of health settles all questions of expenses, direction of the isolation of sick, quarantine of the well, etc.

4. I would earnstly advise you to trust more to a thorough vaccination of the community than to quarantine measures, for it is evident that were every one properly protected by vaccination, these measures would be useless.

Yours truly,

R. J. FARQUHARSON,
Secretary.

SHIPPING EMBALMED BODIES.

MOUNT PLEASANT, IOWA, April 9, 1883.

R. J. FARQUHARSON, M. D.:

Dear Doctor—I write to inquire if a body is carefully embalmed and the vessels thoroughly injected with chloride of lime, the patient dying of no contagious disease, whether that does not cover the design of the Iowa law? That is the case, I know, in Illinois, and I thought the design was the same—absolute protection; besides, the corpse presents a much nicer appearance when thus prepared.

Very truly yours,

H. A. GILMAN,
Superintendent.

DES MOINES, April 11, 1883.

DR. H. A. GILMAN, *Superintendent Iowa Hospital for Insane, Mount Pleasant:*

Dear Doctor—Yours of the 9th inst. came duly to hand.

I would consider the preparation of a body in the manner described by you as being fully within the requirements of our regulations. Public safety being the end proposed, an embalmed body is much less liable to be the cause of disease.

Yours truly,

R. J. FARQUHARSON,
Secretary.

QUARANTINE POWERS OF LOCAL BOARDS.

OSSIAN, IOWA, April 8, 1883.

State Board of Health, Des Moines, Iowa:

I have to report an outbreak of scarlet fever in this place, beginning in my own family. Since Christmas I have had several cases in my practice (all in Bloomfield township, none in Ossian), fourteen altogether, occurring in one family after another, without becoming epidemic. Of the fourteen cases, one—the second one taken with it—died on the fourth day, it being of malignant, or ataxic type. The other cases, by early treatment and good nursing and sanitation, recovered favorably with none of the usual sequela, except very slight anasarca in one case.

Three weeks ago I was called to Ridgeway, eighteen miles west from here, where there had been an epidemic with several fatal cases, to see four cases of the disease. I was myself at that time in an extremely jaded, fatigued condition. One of these cases was suffering from neglected *otitis media purulenta* of both ears. I syringed these ears myself, and the struggling child

scattered the pus over my clothing, of which I took but little notice at the time.

On the 26th of March, after a sudden call during the night and a ride of twelve miles on a hand-car, with insufficient clothing on me, I became sick myself with what I afterward knew to be scarlet fever. Not recognizing the possibility of having it myself, I still tried to attend to practice, but, owing to weakness and confusion of mind and stupor, finally gave up and took to bed. While in this condition, on Friday, March 30th, my youngest child, a girl of four, was taken sick, and the Sunday following her sister, aged six. These children had been exposed to mumps, and their nurse reported to me that they were getting the mumps. I did not examine them, and told the nurse what to do for them. On Tuesday they were reported very sick, and on getting up and examining them, I at once recognized scarlet fever, and began active treatment, in spite of which the older girl died on Friday afternoon. The other though weak is convalescing, with a bad attack of *scarlatinal stomatitis*. My boy, aged eight, is thus far all right.

A cousin of these children, aged two, in a neighboring house, was taken with the disease yesterday, and presents the appearance of it in a severe form.

The usual—or rather unusual—precautions have been and are being taken to prevent the communication of the disease to others.

Your obedient servant,

AUSTIN PEGG, M. D.

GENTLEMEN:

Herewith I enclose a copy of notice served on A. Pegg, M. D., and also his reply, and would feel very thankful for your opinion as to whether the local board of health of this town has exceeded its powers in any of the conditions set forth in said notice or not.

JAMES MALLDAY,
Mayor.

[COPY.]

OSSIAN, IOWA, April 13, 1883.

By order of the local board of health at their meeting held yesterday, the 12th instant, and pursuant to the State Board of Health, that the members of the patient's family should not mingle with other people, nor permit the children of such patient's family to mingle with other children, nor permit any other children to enter your house or premises, nor permit your children on the public thoroughfares for the term of fourteen days, or until further advised.

I am therefore requested by said board of health to notify you to strictly adhere to the above rules and regulations.

S. J. MILLS,
Clerk Local Board of Health.

OSSIAN, IOWA, April 13, 1883.

To Local Board of Health:

Your communication of this date received.

I would beg to state in reply that I have been and am taking all necessary precautions to avoid danger of infection spreading.

I would also notify you that you are exceeding the powers conferred upon you in forbidding the members of my family the public thoroughfares. And that I shall use my own judgment as to their using the streets for exercise necessary to preserve health, and for transacting necessary business—of course using proper precautions while doing so.

Your obedient servant,

A. PEGG, M. D.

DES MOINES, April 14, 1883.

JAMES MALLDAY, *Mayor of Ossian, Iowa:*

Dear Sir—Yours of the 13th instant with inclosures came duly to hand. In such cases the power conferred upon local boards of health by law is very great, and almost unlimited. I cannot see wherein your board has in any way exceeded its powers.

Yours truly,

R. J. FARQUHARSON,
Secretary.

DESTRUCTION OF HOUSES AFTER SMALL-POX.

LAKE CITY HOUSE,
April 12, 1883.

DR. R. J. FARQUHARSON, *Des Moines, Iowa:*

Dear Sir—In this township there remain two houses which contained families infected with small-pox, one of them ten, of which five died, and the other two, of which all died. The disease existed in the most malignant form, and it is impossible to disinfect those places. Have so reported the matter to the township trustees, and would I be justified in setting fire to both buildings. They were cheaply built; one of them is not plastered above and the floor is poorly laid; the floor answers for the ceiling; plastering is off in a good many places, and the upstairs portion is gained by means of a ladder, and is neither lathed nor plastered. This house contained the family of ten persons, father, mother, and eight children, but one escaping the terrible disease; father, mother, and three children died. These houses are an average of that class that are built in a new country. The other dwelling I have not been inside of, do not know much about it. The trustees have ordered me to burn them, and as you are probably as well posted on this subject as any one I could write for information. I do not want to lay

myself liable to any trouble by some *fanatic* who might think they could have been thoroughly cleansed.

I remain, as ever, yours, etc.,

DR. H. H. BALDWIN,
Health Officer for Calhoun township.

DES MOINES, April 16, 1883.

DR. H. H. BALDWIN, *Health Officer, Calhoun township, Lake City; Calhoun county:*

Dear Doctor—Yours of the 12th instant came duly to hand.

The houses should be destroyed, but before burning them, the order of the board should be entered upon the official record, and perhaps you had better have also a written order from the board.

Yours truly,

R. J. FARQUHARSON.
Secretary.

REGULATIONS FOR THE PRACTICE OF MEDICINE.

ILLINOIS STATE BOARD OF HEALTH,
SPRINGFIELD, ILLINOIS,
April 28, 1883.

DR. R. J. FARQUHARSON, A. B., M. D., *Secretary Iowa State Board of Health, Des Moines, Iowa:*

Dear Sir—The last (4th annual) report of our Board which you have already received, contained a directory of the medical diploma conferring bodies of the United States and Canada, which I am desirous of supplementing in our next report with a digest of all the laws, in each State, having reference to the regulation of the practice of medicine and dissection. To this end I request your co-operation.

Will you kindly forward copies of such laws, if any, now or recently in force in your State and state their efficiency or the necessity of new laws on these subjects.

I believe that such a compilation will do much toward securing a uniform system of laws on these subjects in all States. Any other information you may be able to give on this subject will be thankfully received, and duly credited in the report.

I am yours respectfully,

JOHN RAUCH.

DES MOINES, April 30, 1883.

DR. JOHN RAUCH, *Secretary of Illinois State Board of Health, Springfield:*

Dear Doctor—Yours of the 28th instant came duly to hand.

Inclosed please find copies of all laws in Iowa upon the subject of the practice of medicine and of dissection.

I make no comment upon the absence in this State of laws regulating the practice of medicine, having never been able to make up my mind whether such laws do not do more ill than good, my own experience from a residence in one State having such laws (Louisiana) being that the burden of them falls upon the honest part of the profession.

Yours truly,

R. J. FARQUHARSON.

The report of the Secretary, was on motion, accepted.

On motion the Secretary was authorized to print a small circular on small-pox, and to pay for telegrams announcing outbreaks of that disease.

Adjourned to 1:30 P. M.

AFTERNOON SESSION.

1 O'CLOCK, P. M.

Present, Dr. Clark and all other members.

The Secretary read a paper on the Danger of Small-pox Hospitals, which was approved and ordered printed in the biennial report.

On motion Dr. W. S. Robertson was unanimously re-elected President of the Board for the ensuing year.

On motion the Secretary was authorized to expend five hundred dollars, or so much thereof as may be necessary, for the purchase of books for the Library during the year.

Bills were audited on vouchers 303 to 319, inclusive, and ordered paid by the Secretary.

On motion the computation of expenses of the Board meeting was made as follows:

Dr. Robertson	$ 20.00
Dr. Dickinson	5.00
Dr. Lewellen	30.00
Dr. Hull	28.00
Dr. Olney	15.00
Dr. Reynolds	23.00

Dr. Clark	$ 43.00
S. McPherson	30.00
J. L. Loring	10.00
Total	$ 204.00

On motion the Board adjourned to meet at Des Moines the second Wednesday in November next.

LIBRARY.

The following books have been received by purchase or exchange, for the library of the State Board:

HYGIENE.

Hygiene and Public Health, 2 vols. (Buck.)
Practical Hygiene. (Parks-Chaumont.)
Report of United States Navy Department, 1879.
Bible Hygiene. (A Physician.)
Lectures on State Medicine. (DeChaumont.)
American Health Primers. 12 vols.:

I. Hearing, and How to Keep it. (Burnett.)
II. Long Life and How to Reach it. (Richardson.)
III. Summer and its Diseases. (Wilson.)
IV. Eye-sight and How to Care for it. (Harlan.)
V. The Throat and Voice. (Cohen.)
VI. Winter and its Dangers. (Osgood.)
VII. The Mouth and the Teeth. (White.)
VIII. Brain Work and Overwork. (Wood.)
IX. Our Homes. (Hartshorne.)
X. The Skin in Health and Disease. (Burkley.)
XI. Sea Air and Sea Bathing. (Packard.)
XII. School and Industrial Hygiene. (Lincoln.)

Hygiene of Schools. (Budgett.)
Hygiene of Infants. (Walton.)
Physiological Memoirs, 1863. (Hammond.)
Hygiene and Physiology.
Public Health. (Guy.)
Health Primers. 9 vols.:

I. Exercise and Training. (Kalfe.)
II. Alcohol, its Use and Abuse. (Greenfield.)
III. The House and its Surroundings.

IV. Premature Death; its Promotion and Prevention.
V. Personal Appearances. (Coupland.)
VI. Baths and Bathing.
VII. The Skin and its Troubles.
VIII. The Heart and its Functions.
IX. The Nervous System.

A sober and temperate life. (Cornaro.)
Nuevos, elementos de Hygiene. 2 vols. (Londe.)
Hygiene of the United States Army, 1875.
American Public Health Association Reports, 1873 to 1882. 8 vols.

PAMPHLETS.

Hygiene Medical Reports, United States Navy, 1879.
Hygiene of the United States Army, 1875.
Hygiene Influence of Plants. (Pettenkoffer.)
Public Hygiene and State Medicine.
International Hygiene—Progress Of. (Cabell.)
Congress International d'Hygiene, 1882.
Internal Parasites of Domestic Animals. (Perkins.)
A City of Health—Address. (Richardson.)
Prophylaxis. (Ordronaux.)
Hygiene of Mines. (Raymond.)
Health Matters in Japan. (Morse.)
How to Maintain Long Life. (Cornaro.)
Effect of Lead on the Heart. (Carson.)
Plants in Living Rooms. (Anders.)
Cereals Under the Microscope. (Cutter.)

SANITARY.

The Sanitarian. 10 vols. 1873–83.
Drainage of Houses and Towns. (Waring.)
Sanitary Engineering. (Philbreck.)
Construction of Hospitals. (Galton.)
Hand-book of House Sanitation. (Bailey-Denton.)
Sanitary Care of Children.
Hospitals for the Insane. (Kirkbride.)
Heating and Ventilation of Hospitals. (Billings.)
Model By-laws for Sanitary Authorities. (Loudon.)
Sanitary Engineering. (Denton.)
Sewers and Drains. (Adams.)

House Drainage and Water Service. (Bayles.)
Ventilation. (Leeds.)
Milk Analysis. (Wanklyn.)
History of Massachusetts' General Hospital. 2 vols. (Bowditch.)
Hospitals for Infectious Diseases. 10th London report.
Prisons in England and Wales, A. D., 1777. (Howard.)
By-laws of the Town of Boston, A. D., 1801.
Employment of Children in Mines. 2 vols. (Waring.)
English Coal Mines. 2 vols. 1851–54. (Dunn.)
Healthy Houses. (Eassie.)
Journal of Prison Discipline. (Penn.) 2 vols.
Mental Cultivation and Excitement. (Brigham.)
Rush's Essays. 1806. (Rush.)
Hospital Construction. (Hopkins.)
Herbert Hospital at Woolwich. (Galton.)
Les Ambulances. (Marc.)
Purification of Water-carried Sewerage. (Robinson and Melliss.)
Health of towns Commission Report. (English.) 2 vols. 1844.
Veterinary Sanitary Science. (Fleming.)
Hand-book for Hospitals.
Hand-book of Rural Sanitary Science. (Marsh.)
Manual of Public Health. (Hart.)
Municipal and Sanitary Engineer's Hand-book. (Boulnois.)
Sanitary Engineer. 5 vols.

Pamphlets—

Thoughts About Home. (Lyon.)
Privy System of New Orleans. 1879.
Separate System of Sewerage. (Waring.)
Management of Privies. (N. O. San. Assoc.)
Regulations of Mississippi Valley Sanitary Council. 1879–82.
Rural Cemeteries. (Cleveland.)
Quarantine Regulations, National Board of Health.
Infectious Diseases, Act of Congress to Prevent.
Drainage and Sewerage of New Orleans.
Sewerage of Worcester, Massachusetts. 1882.
Quarantine Laws of Louisiana. 1880.
Address of Dr. Fenner, N. O. Auxil. San. Assoc. 1880.
Address of N. O. Auxil. San. Assoc. to cities and towns. 1879.

Address of Dr. White, N. O. Auxil. San. Assoc. on Disinfection.
Address of Dr. Rauch before N. O. Auxil. San. Assoc. 1879.
Sanitary Survey of Irvington. (Metcalf.)
Earth Closets—How to Make Them. (Waring.)
Odorless Excavator.
Sanitary Suggestions. (Watson.)
A Few Thoughts About the Home. (Lyon.)
Healthy Homes for Farmers. (Kedzie.)
Effect of Sanitation on Diseases of Children. (Merie.)
Interment in Towns. (Chadwick.)
Fermentation and Putrefaction. (Pemberton.)
Worcester Sewerage—Blackstone River.
Modern Sanitary Engineering. (Prescott.)
Cultivation of Natural Forests. (Cleveland.)
Management of Privies. (Devron.)
Providence, R. I., Sewerage. (Shedd.)
Inundations—Their Influence on Health. (Chaille'.)
House Drainage. (Durham.)
Sewerage, Drainage and Disposal of Excreta. (Loring.)
Small-pox Hospitals. (Farquharson.)

WATER.

Examination of Water. (Fox.)
Analysis of Water. (Frankland.)
Potable Water. (Ekin.)
Mineral Springs of the United States. (Walton.)
London Water Supply. (Tidy.)
Water Analysis. (Macdonald.)
Filtration of Potable Water. (Nichols.)
Hand-book of Water Analysis. (Austin.)
Water Supply Engineering. (Fleming.)
Water Supply, Chemical and Sanitary. (Nichols.)

Pamphlets—

Lecture on Water. (Chandler.)
Water Supply of Boston.
Mineral Water Controversy. (Schultz.)
Chicago Water Supply. 1879.
Water Supply of Toronto.

Water Supply—Treatise on. (Dickinson.)
Fauna of New York Croton Water. (Gissler.)

FOOD.

Dietaries, Air and Water. (Smith.)
Lectures on Food. (Lethby.)
Culture of the Sugar Beet. (Le Duc.)
Adulteration of Food. (Hassell.)

Pamphlets—

Adulteration of Food—Canadian Health Department, 1876 to 1881.
Adulteration of Food, Drinks, and Drugs—laws of Canada.
Trichinæ—How to Detect Them. (Phin.)
Milk and Dairies in New Orleans, 1879.
Typhoid Fever Traced to Impure Milk. (Ballard.)
Adulteration of Milk a Misdemeanor. (Prentice.)
Effect of Alum in Baking Powders. (Mott.)
Oleomargarine and Butterine Analyized.
Milk as a Food. (Liebert.)
Infant Feeding and Infant Food. (Jacobi.)
Fungi in Cow's Milk. (Percy.)

DISEASES.

Diseases of Modern Life. (Richardson.)
Diseases of the Mississippi Valley. 2 volumes. (Drake.)
Cholera Epidemics of 1873. (Woodworth.)
Production and Propagation of Malaria. (Macculloch.)
Maladies des Artisans. (Partissier.)
Diseases of Domestic Animals. U. S. Rep., 1879–80. 2 vols.
Nomenclature of Diseases. (Woodworth.)
Is Consumption Contagious? (Clapp.)
Filth Diseases and their Prevention. (Simon.)
Vaccination. (Hibbard.)
Winter Epidemics. (Cook.)
Poison and Antidotes, A. D., 1775. (Prestwich.)
History of Yellow Fever at Norfolk in 1855. (Armstrong.)
Trans. of Epidemiological Society of London, 1855.
How to Avoid Diseases in Hot Climates, 1811. (Linn.)

De L'Alcoolisme. (Magnan.)
Diseases of the Horse. (Youatt.)
Diseases of Cattle. (Jennings.)
Epidemic Cholera.
Cholera, Treaties on. (Knapp.)
Yellow Fever in New Orleans and Gibralter, 1828–1853.
Vaccination. (Edwards.)
Malaria and Miasmata. (Barker.)
Climate and Fevers in India. (Fayrer.)
Pestilential Diseases of the United States. (Caldwell.)
Animal Plagues from 1495 to 1844. 2 vols. (Fleming.)
Human and Animal Variola. (Fleming.)
The Four Bovine Scourges. (Walley.)
Rabies and Hydrophobia. (Fleming.)

Pamphlets—

Yellow Fever in New Orleans in 1853. (Fenner.)
Yellow Fever at Norfolk in 1855.
Yellow Fever at Gibralter in 1828. (Chervin.)
Diseases of the African Islands. (Allan.)
Electrical Fluctuations as Cause of Disease. (Littel.)
Meteorology and Epidemics. (Jewell.)
Cholera and Yellow Fever in the U. S. Army, 1867. (Woodward.)

SCIENCE.

Annual Record of Science and Industry, 1871 to 1878. 8 vols.
Annual of Scientific Discoveries, 1850 to 1871. 21 vols.
Annual Parasites and Messmates. (Van Benden.)
Geology of Iowa. 2 vols. (White.)
Entozoa of Man and Animals. (Cobbold.)
Physical Geography of Iowa. (White.)
Physiography. (Huxley.)
Bacteria. (Magnan.)
Suicide. (Morselli.)
Elements of Medical Zoology. (Monquin and Tandon.)
Fallacies of Vital Statistics. (Rumsey.)
United States Signal Service Report, 1880–1881.
Medical Science—Naval Hygiene. (Gihon.)
Science in Short Chapters. (Williams.)

Scientfic American. 15 vols.
Popular Science Monthly, 1872 to 1882. 20 vols.

Pamphlets—

The Physics of Ice. (Lewis.)
Hæmatooza in Blood of Animals. (Moss.)
The Madura, or Fungus Foot of India. (Hogg.)
Parasites in the Head of a Bat. (Maddox.)
Diseased Pork—Parasites in Man. (Gamgee.)
Parasites on Living Animals. (Gluge.)
Physiology of Hair and Wool. (Brown.)

REFERENCES.

Medical Dictionary. (Dunglison.)
United States Dispensatory. (Wood & Bache.)
Alimentaires Medicamenteuses et Commercials. (Chevallier.)
Iowa Gazetteer, 1881–2. (Polk.)
Des Moines City Directory. (Bushnell.)
Hospital Library Catalogue—Pennsylvania.
Iowa Medical Directory. (Lathrop.)
Webster's Dictionary.
United States Census, 1880.
Atlas of Iowa. (Andreas.)
Dictionary of Terms in Arts and Mechanics. (Weale.)
United States Commissioner of Education, Report 1880.
Encyclopædia of Manufactures, two volumes. (Spon.)
Sources of Longevity. (Lambert.)
Index Catalogue of Library of United States Surgeon-General, three volumes.
Catalogue of United States Army Medical Museum.
Compendium of Tenth United States Census.
United States Medical Directory, 1880. (Butler.)
Encyclopœdia of Medicine, twenty-one volumes. (Zemssen.)
Dictionary of Hygiene. (Blythe.)
Dictionary of Medicine. (Quain.)
Dictionaire de Medicine. (Littre and Robin.)
Encyclopœdia of Insurance, five volumes. (Walford.)
Rand, McNally & Co.'s Indexed Atlas of the World.

HEATING AND VENTILATION.

Manual of Heating and Ventilation. (Schumann.)
Coal-mines—Ventilation. (Roy.)
Coal-mines—Ventilation (English-Phillips.)
Anthracite and Health. (Derby.)
Cottage Hospitals. (Burdette.)
Ventilation in American Homes. (Reid.)

Pamphlets—

Thermal Ventilation of Bublic Buildings. (Watson.)
Ventilation. (Spaulding.)

LAW.

Code of Iowa, 1873.
Laws of the General Assembly, 1874 to 1883, five volumes.
Civil Mal-Practice. (McClelland.)
Medical Jurisprudence. (Traill.)
Laws of the City of Philadelphia, 1862.
Hand-book for Coroners. (Lee.)
Sanitary Code for Cities. (Clark.)
Legal Medicine. (Tidy.)
Iowa Digest, four volumes.
Medical Jurisprudence (Taylor), two volumes.

Pamphlets—

Nuisances—Common Law Citations Thereon. (Watson.)
Effect of State Medicine on Intemperance. (Mann.)
State Medicine. (Conn.)
Inebriate Insanity—Cerebral Trance. (Crothers.)
Arbitrary Quarantine. (Thornton.)
Quarantine Laws of Louisiana, 1880. (Jones.)

MEDICAL.

American Medical Journal, 1828 to 1882.
Lectures on Institutes and Practice, 1811. (Rush.)
Medical Inquiries, 1805. (Rush.)
System of Nosology. (Goode.)
Post-mortem Examinations. (Virchow.)
Medical Economy During the Middle Ages. (Fort.)

Poisons. (Taylor.)
Poisons and Antidotes. (Prestwich.)
Physiologie, Pathologique and Atlas, 3 vols. (Liebert.)
American Journal of Medical Science, 1827 to 1882.

Pamphlets—

List of Skeletons and Crania. (Yarrow.)
L'Alcoolisme. (Magnan.)
Certainty in Medicine. (Contes.)
Spinal Irritation—Nervous Diseases. (Parrish.)
Humanized and Bovine Virus Compared. (Foster.)
Small-pox and Vaccination. (Chaille'.)

VITAL STATISTICS.

Of Massachusetts, 1879 to 1882.
Of Michigan, 1870 to 1879.
Of Rhode Island, 1879 to 1880.
Philadelphia County Prison, 1850 to 1873.
Life tables—Computation of. (Elliott.)
Of Louisiana, 1851. (Burton.)
Connecticut, 1880.

Pamphlets—

Law of Mortality in Massachusetts. (Elliott.)
Suicides in New York in eleven years. (Nagle.)
Statistics of the City New Orleans and Austin, Texas. (Waring.)
Death Rate of Memphis, 1880. (Hamphreys.)
Scarlatina—Statistics of the United States. (Minor.)

REPORTS.

State Boards of Health—

Arkansas, 1882.
California, 1870 to 1882.
Colorado, 1877 to 1880.
Connecticut, 1878 to 1882.
Delaware, 1879 to 1880.
District of Columbia, 1879 to 1882.
Illinois, 1878 to 1882.

Indiana, 1882.
Kentucky, 1880 to 1882.
Louisiana, 1879 to 1881.
Massachusetts, 1874 to 1882.
Michigan, 1873 to 1881.
Minnesota, 1881 to 1882.
New Hampshire, 1882.
New Jersey, 1879 to 1882.
New York, 1880 to 1882.
Rhode Island, 1879 to 1881.
South Carolina, 1881.
Tennessee, 1879–'80.
Wisconsin, 1876 to 1883.

City Boards of Health—

Augusta, Ga., 1883.
Burlington, Vt., 1881–'83.
Chicago, 1878–'80.
Kansas City, 1882.
Memphis, 1881–'82.
Richmond, Va., 1882.
National Board of Health, 1879, 1882.
New Haven, Conn., 1882.
Philadelphia, 1861 to 1879.
Reading, Pa., 1880 to 1882.
Utica, N. Y., 1881.
Worcester, Mass., 1882.
Dubuque, 1881.
Davenport, 1881.
Rock Island, Ill., 1882.

Medical—

American Health Association, 8 vol., 1873 to 1882.
Medical Statistics U. S. Army, 1839 to 1859, 2 vols.
Surveyor-General U. S. Navy, 1879–80, 2 vols.
Mortality in U. S. Army, 1840.
Medical and Surgical History of the Rebellion, 5 vols.
Sanitary Commission of Crimean War, 1855–56.

Medical Societies—

American Medical Association, 1855.
Alabama State Medical Society, 1880–82.
Michigan State Medical Society, 1874 to 1882.
New Hampshire State Medical Society, 1881.
South Carolina State Medical Society, 1880–82.
Iowa State Medical Society, 1881.
Louisiana State Medical Society, 1851.
Iowa State Pharmaceutical Association, 1882.
Tennessee State Medical Society, 1878–80.
New York Academy of Medicine, 1883.
Iowa State Agricultural Society, 1881–82.
Iowa State Horticultural Society, 1880–81.

Sanitary—

Sanitary Report, Surveyor-General U. S. Navy, 1879 to 1881.
13. Privy Council, London, 1871.
London Local Government Board, 1871 to 1880.
Sanitary Commission, Mississippi Valley, 1866. (Newberry.)

Miscellaneous—

U. S. Cattle Commissioners, 1882.
Petroleum as an Illuminator. (Chandler.)
Dangerous Illuminating Oil. (Macumber.)
Methods for testing Illuminating Oils. (Elliott.)

PERIODICALS.

Sanitary Engineer. (Weekly.)
Sanitarian. (Monthly.)
National Board of Health Bulletin.
Iowa Weather Service.
United States Postal Guide.
Sanitary News. (Weekly.)

CIRCULARS.

The following circular was issued to the clerk and health officers of local boards throughout the State:

[FORM 14 B.]

TO CLERKS AND HEALTH OFFICERS.

IOWA STATE BOARD OF HEALTH,
DES MOINES, July 1, 1883.

CLERKS OF LOCAL BOARDS.

The statute requires every clerk of a township, city, or town to make a report, as clerk of the local board of health, to the State Board, whether there has been organized in the city, town, or township, a board of health or not, or without reference to whether he has, or has not, received any notice of contagious diseases, or reports from those who should report to him. It is expected the clerk will ascertain in some manner the "facts required," and report them as accurately as possible. Yet clerks persist in returning their blanks not filled out, and with them a letter saying: "No cases have been reported to this office, and I have nothing to report." They will then go on to say: "There have been no epidemic diseases in this township the past year; no deaths. The general health of the people, owing to general cleanliness, pure air, good water and drainage, has been unusually good." Now, this conveys very much of the intelligence desired in the blanks, and it should be placed there, so that it could be properly filed and readily referred to. To read all such letters involves time, and to keep trace of letters, scraps of paper, and postal cards, is nearly impossible. Some clerks neglect to insert the name of their city, town, or township, giving only their signature; and the post-office stamp, which is very uncertain in most cases, is the only means of ascertaining where the return came from. Some give the location, but omit their signature and post-office address.

Some clerks return the blanks not filled out, but write, saying: "There is no board of health in this city [or township]." In every city, town, or township in the State there exists by law a local board of health. (1)

(1) 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.—[Chap. 151, Laws 1880.]

Local boards of health, therefore, existing by positive enactment, the clerks of such boards are required to report to the State Board, whether the officers of the city, town, or township perform their duty or not. (1) The framers of the law evidently presumed the clerk of a township, has, necessarily, some general knowledge of the conditions and occurrences in his own township, and it is reasonable to suppose, although no official report has been made to him, his facilities for obtaining information in his township are such as to enable him to make a very full and satisfactory report of the facts as they exist. The blanks are so arranged that when he cannot give positive information he may give his opinion, based on his knowledge and best judgment. If clerks will bear this in mind, and so make their return *on the blanks*, they will save a vast amount of trouble and labor in the office of the State Board, and materially aid the cause for which the law was established. It should be remembered that there are over three thousand clerks in the State, and irregularities which may seem trivial in a single case amount to considerable in the aggregate. They should bear in mind, also, that it is just as important to report the fact that no sickness or deaths have occurred as to report a large number. This information is important to this office as showing when and under what conditions there is exemption from disease. The object of the State Board is to ascertain why diseases are more prevalent in one locality than another, and, if possible, remove the causes where they exist. With the hearty, prompt co-operation of local boards it is possible to do much, if only the need thereof is made plain.

The reports of clerks of local boards are a part of the records of the State Board, a part of the lasting records of the facts to which they relate in the several cities, towns, and townships of Iowa, at the time they were made, to be kept for future reference and comparison with future conditions which arise respecting their locality. This fact alone should stimulate clerks and officers of local boards to contribute all that is possible to be obtained, so that when it is wanted it will be valuable and reliable, and furnish a firm foundation on which to build up knowledge which shall aid to prevent sickness and death. Therefore, make your report on the blanks furnished by the State Board, whatever it may be, and send nothing on postal cards, scraps of paper, or by letter, pertaining to health, unless it be as a special report, when the regular report is not due, and report only cases of contagious diseases at any time. Do not use the Health Physician's Blank, which is Form 1C.

Where a township clerk is also clerk of a city or town, he must keep a separate record for each, and so report to this office. A township board of health has no jurisdiction or powers in an incorporated city or town which

(1) 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.

may be situate within such township. Neither does the board of health of an incorporated city or town have jurisdiction outside the limits of the corporation.

Many clerks inquire how they are to obtain the reports of cases of contagious diseases, with which to make the record. The law gives the local boards power to make such regulations regarding the causes of sickness as they deem necessary. (1)

It is clearly the object of the law, and duty of local boards under the law, to protect the people from ravages of contagious diseases, and they should possess the earliest possible information of the presence of such diseases within their jurisdiction. The State Board of Health, therefore, recommend the adoption of regulations by local boards, to-wit:

Whenever any physician shall know that any person whom he is called upon to visit, is infected with small-pox, scarlet fever, or any other disease dangerous to the public health, he shall immediately give notice thereof to the board of health or health physician of the city, town, or township [as the case may be] in which such diseased person may be.

Whenever any householder shall know that any person within his family is taken sick with small-pox, scarlet fever, or any other disease dangerous to the public health, he shall immediately give notice thereof to the board of health or to the health physician of the city, town, or township [as the case may be] in which he resides, and, until instructions are received from the board of health or the health physician, no clothing or other articles that may have been exposed to infection, shall be removed from the house until thoroughly disinfected.

The penalty for violation of these regulations should be such as would secure compliance therewith, and appear to be fixed by the last clause of section, 16 chapter 151, laws of 1880.

These regulations should be given extensively to the public, and it is believed that so soon as the people thoroughly understand that it is absolutely essential to the proper protection of community that prompt notice be given of contagious and dangerous diseases, they will not hesitate to take all possible means to protect their neighbor from the danger of suffering and death.

When the board of health has received notice of dangerous diseases, their duties have just begun. They should act promptly and vigorously to thoroughly restrict and prevent any further spread of the disease. To this end the State Board has adopted rules and regulations which will be sent to all local boards of health. Immediately on the outbreak of an epidemic, notice

(1) Local boards of health shall make such regulations respecting nuisances, sources of filth and *causes of sickness* within their jurisdiction, and on any boats in their ports or harbors, as they may judge necessary for the public health and safety; if any person shall violate any such regulations, he shall forfeit a sum of not less than twenty-five [dollars] ($25) for every day 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.—*Chap.* 151, *Laws* 1880.

should be given by the clerk to this office, in order that its progress and decline may be studied.

Upon the occurrence of a case of small-pox in a city, town, or township, in any form—whether modified by vaccination or not; whether mild or severe, the clerk or health officer should send a short telegram announcing the fact to this office, charges to be collected here. Where there is no telegraph the same should be promptly communicated by mail. When sent by mail a more extended history of the source and extent of the disease is desirable.

The clerk should report promptly to this office the name and post-office address of the health officer of the board when appointed. This is important, that he may be furnished with the necessary documents for his use.

DUTIES AND POWER OF HEALTH OFFICER.

The health officer of a local board is not a member of the board. His powers and duties, when not expressly stated in the statute, are only such as are conferred by action of the board. They should, therefore, be fully and clearly defined, that his action in enforcing regulations of the board may be of legal force and effect. He is the advising counsel of the board in sanitary matters. When appointed for more than one city, town, or township, he must make a separate report for each to the State Board.

Blanks for these reports will be furnished from this office. This report should cover the exact territory over which the board has jurisdiction, for which he is the health officer, and should not include anything outside of such jurisdiction.

In case any disease should appear in his locality as an epidemic, a special report of the fact should be made to this office so soon as possible. It is also expected that he will study and record the conditions coincident with the rise, progress, and decline of such epidemic, and in due time report the same to this Board. Concerning every such occurrence he should be able to report some facts which will be of use in advancing the cause of public health.

Repeated inquiries are made at this office whether or not health physicians are expected to treat cases of epidemic, or contagious diseases, which come under the quarantine powers of a local board; or to treat sick paupers of a township. Such is not the intent of the law. That is a matter entirely within the control and discretion of the sick or their friends, except as to paupers, for which provision is made under section 1361 of the Code of 1873.

RECORDS.

Local boards of health should keep a record of all proceedings separate and distinct from all proceedings as city council, or township trustees, and all proceedings should be separate and distinct, and not as a council or board of trustees, as their organization as board of health is under a special law, and the legality of their proceedings can only be shown and evidenced by record. These records may be obtained of blank book makers throughout

the State generally, made from forms prepared by the State Board, at one dollar per quire, bound with a record for proceedings in front, and for contagious diseases in the back. The health physician should also be supplied a record like the clerk's, in which to record the history and cases of contagious diseases.

REGULATIONS.

City and incorporated town boards of health may adopt the ordinances of their city or town as the regulations of their board, and the person who violates the regulations of a local city or town board, when so adopted, may be said to commit two offenses, one against the ordinances of the city, and one against the laws of the State, and the prosecution for a violation of the regulations may be by the city, and in its name; or by the board, or by any member thereof, under the State law. It is preferable to prosecute violations under ordinances as criminal offenses; for, under the statute, the penalty is only recoverable by civil action for debt.

All regulations adopted by a township board of health should be published or posted. The rule for this is found in section 416, of the Code of 1873, which, in the opinion of the Attorney-General, is in force, to-wit:

"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 therein."

The State Board has printed their rules and regulations on a sheet in form for posting up. These sheets will be sent on application, for one cent each, or five for two three-cent postage stamps, which is the actual cost of printing.

In ordering, send for Form 26B, stating also the number of sheets wanted.

GENERAL REMARKS.

A large number of clerks have notified this office that the township trustees or city or town councils have not organized as a board of health; or that they have met and adjourned without adopting any regulations or rules. Section 24, chapter 151, laws of 1880, says local boards *shall* meet for the transaction of business in May and November of each year, and section 16 says they shall make such regulations respecting nuisances and causes of sickness as they shall judge necessary for the public health. The presumption of the law is that they will perform all the duties contemplated by the statute to protect the community within their jurisdiction from contagious and infectious diseases, and from all causes of sickness within their power. Short of this, they have not complied with the object and intent of the law. To assume that contagious and dangerous diseases or cause of sickness do not exist, is no assurance they will not exist, and the people for whose benefit the laws were enacted have the right to demand that the proper authorities shall perform their duty and afford them the immunities contemplated by the statute for their restriction and prevention.

Attention is directed to the decision of the Attorney-General on this point, given in the note below. (1)

EXPENSES OF LOCAL BOARDS.

Repeated inquiry is made, as to how the expenses of local boards in cases of small-pox or other epidemic diseases are to be paid. The Supreme Court, at the June term, 1883, in the case of the *City of Clinton v. County of Clinton*, wherein the city of Clinton sought to recover expenses incurred for quarantining several persons sick with small-pox, held that the sick persons or those liable for their support must pay; if they were unable to do so, the county must pay such expenses. The court also held that local boards of health have complete jurisdiction, and full power in such cases to take such measures as they deem best for protecting the inhabitants against the spread of the disease. As suggested by the court, the intent of the law is best subserved by prompt, effective action. The wisdom of this action is evidenced by successful results. Unreasonable expenditure will be reviewed by the courts, hence, local boards should regard economy.

CORRESPONDENCE.

In returning blanks to this office, be careful to insert the name of your township and county, and sign your name, with post-office address, and direct to "State Board of Health, Des Moines, Iowa." In writing to this office, always give your post-office address, township, and county, as there are many townships of the same name in different counties, and post-office stamps are frequently illegible.

Preserve all circulars received from this office and deliver them to your successor in office.

In ordering blanks or circulars from this office, give the number of the Form, and you will then get just what you want.

Very respectfully,

R. J. FARQUHARSON,
Secretary.

By order of the State Board.

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(1) "Rules and regulations made by the State Board of Health and directed to local boards of cities, towns, etc., are of full force and effect upon the people without subsequent indorsement or action of such local boards."

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

[FORM 8 B.]

TO HEALTH OFFICERS.

OFFICE OF THE SECRETARY OF THE
IOWA STATE BOARD OF HEALTH,
DES MOINES, July 1, 1883.

To the Health Physician:

Sir—I herewith send you a blank form (1C) for your use in making your annual report to this Board required by law,* for the year ending October 1, which must include the entire month of September.

Please fill out and return this report as soon as possible after October 1, and before November 15.

This blank form is for diseases like one sent to the clerk of your board, but your report should be made according to your best knowledge, leaving his report to be made by him according to his best knowledge. If each of you will report the cases reported to himself we will then know the total number of cases reported, and to which class of officers the greatest number of reports are made; and if we have estimates of the probable number of cases not reported, made by two different persons in each locality, we may gain a good idea of the actual condition of the public health and of the public health service in the different parts of the State. General truths concerning the entire State cannot well be reached by compilation of reports when only the best, or poorest townships of many counties are represented; it is, therefore, important that every health officer shall make a report. For a similar reason, every blank should be filled. If no sickness has occurred within your jurisdiction, or if there has been no case of any disease concerning which a report is asked, it is important to state that fact, and the reason, if known, for such healthfulness, and also the population, etc., in the blank spaces provided for those statements in the report. It is also important to fill the blanks for the probable number of cases of diseases not reported to you. As these reports are to be compiled and published, it is necessary to have uniform blank forms, because it is impossible to compile from letters and postal cards, on account of the time required to search through them; and for this reason every fact to which the report relates should be entered in its proper place in the report, on the blank, and not sent on scraps of paper, by letter, or on postal cards.

Your report should be made out for the exact territory over which your board has jurisdiction, and for which you are the health officer, and it should

*Chapter 151, Laws of 1880, section 15. It shall be the duty of the health physician, and also the clerk of the local board of health 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.

not include anything outside of such jurisdiction. A township board of health does not have jurisdiction in an incorporated town or city, even though such city or town be situated within the limits of the township; neither has a city board of health jurisdiction in territory outlying the city. If you have been appointed health officer for a township and an incorporated city or town, it is necessary that you make separate reports for each, just as separate as if they were made by different persons.

Your attention is respectfully asked to chapter No. 151, laws of 1880, relative to duties of health officers of cities and towns. It is recommended that your board of health have copies of the law, and rules and regulations of the State Board, thoroughly distributed within your jurisdiction, in order to call attention to the subject, and secure material for a complete record in your office relating to diseases which endanger the public health. You should have a record book in which to record cases of dangerous diseases, like that of the clerk. See circular 14B.

It is not expected that it will always be possible to fill every column of your record; but so much as it is possible to learn concerning each case should be recorded and reported, because the single fact of the number of cases of sickness from each such disease will be of value in connection with the records of deaths and other knowledge collected at this office. It is hoped that you will not fail to record all cases of such diseases under your own care.

In case any disease should appear in your locality as an epidemic, please make a special report of the fact to this office as soon as possible. It is also expected that you will study and record the conditions coincident with the rise, progress and decline of any such epidemic, and in due time report the same to this board. Concerning every such occurrence you should be able to report some facts which will be of use in advancing the cause of public health.

Your local board has two kinds of functions: First, to utilize for your own community the sanitary knowledge already accessible, by restricting communicable diseases, as directed in Circulars 17B, 18B, and 21B, by recording all cases of diseases which endanger public health, that their conditions may be studied, and prevention learned; by inaugurating measures for preventing sickness and death from ordinary diseases in your community; in improving your sanitary and hygienic condition. Second, by giving to the State Board the result of your experience and research, thus adding to the general fund of knowledge, which will be compiled, and returned to the local boards in the reports of the State Board.

Repeated inquiries are made at this office whether or not heath physicians are expected to treat cases of epidemic, or contagious diseases, which come under the restrictive powers of a local board; or to treat sick paupers of a township. Such is not the intent of the law. That is a matter entirely within the control and discretion of the sick or their friends, except as to paupers, for which provision is made under section 1361 of the Code of 1873.

The State Board of Health is especially desirous to obtain all possible information relative to accidents, loss of life, or injuries to persons and prop-

erty in this State from the use of kerosene, gasolene, or other product of petroleum. If there were any such in your locality during the past year, or any should in future occur, will you please send to this office the facts; and if any person was injured, give the name and extent of injury, that they may be presented to the next Legislature, for the purpose of securing such a change in the law regulating the sale of illuminating oils as will better protect the people from dangerous oils and compounds.

Immediately upon the occurrence of a case of small-pox in your city, town or township, in any form—whether modified by vaccination or not; whether mild or severe, you are requested to send a short telegram announcing the fact to this office, charges to be collected here. Where there is no telegraph the same should be promptly communicated by mail. When sent by mail a more extended history of the source and extent of the disease is desirable.

By direction of the State Board of Health.

Very respectfully,

R. J. FARQUHARSON,
Secretary.

Please preserve all circulars which you receive from this office.

Direct all correspondence with this office to "State Board of Health, Des Moines, Iowa."

The first edition of the circular on the Restriction and Prevention of Scarlet Fever having been exhausted, a second and revised edition was printed, to-wit:

[FORM 17B.]

RESTRICTION AND PREVENTION OF SCARLET FEVER.

SCARLET FEVER IS NOW BELIEVED TO BE ONE OF THE MOST CONTAGIOUS DISEASES.* One attack usually prevents subsequent attacks. The greatest number of deaths from this disease are of children under ten years of age. Adult persons do sometimes have the disease. Scarlet fever is believed to arise from a special contagium or poison which may be conveyed, to persons previously unaffected, by personal contact, by infected clothing, or paper rags, or by any of the discharges from the body of the persons affected with the disease.

THE DISCHARGES from the throat, nose, and mouth are considered extremely dangerous, and those from the skin, eyes, ears, kidneys, and bowels are also dangerous, and remain so for a considerable time.

FILTH, all forms of uncleanliness, and neglect of ventilation increase the danger of spreading the disease.

COMMUNICATION. It is believed that the disease may be communicated by a person recovering therefrom, so long as the usual subsequent scaling or peeling of the skin continues.

* This disease is sometimes called "Scarlatina," "Scarlet Rash," "Canker Rash," etc.

THE INTERVAL OF TIME which may elapse after the exposure to the contagium of scarlet fever, and during which a susceptible person so exposed may expect to be taken sick with the disease, varies from one to fourteen days.

SEPARATION OF THE SICK FROM THE WELL. Whenever a child has sore throat and fever, and especially when this is accompanied by a rash on the body, the child should be immediately isolated as completely as possible from other members of the household, and from other persons, until a physician has seen it and determined whether it has scarlet fever. ALL PERSONS KNOWN TO BE SICK WITH THIS DISEASE SHOULD BE PROMPTLY AND THOROUGHLY ISOLATED FROM THE PUBLIC NOT LESS THAN FORTY DAYS.*

THE ROOM INTO WHICH ONE SICK WITH THIS DISEASE IS PLACED should previously be cleared of all needless clothing, carpets, drapery, and other materials likely to harbor the poison of the disease, except such articles as are essential to the well-being of the patient. The sick room should have no carpet, or only pieces, which can afterward be destroyed. Provision should be made for the introduction of a liberal supply of fresh air and the continual change of the air of the room without sensible currents or drafts.

POCKET-HANDKERCHIEFS, that need be saved, should not be used by the patient; small pieces of rag should be substituted therefor, and after being once used should be immediately burned.

SOILED BED AND BODY LINEN should be placed in vessels of water containing chlorinated soda, chlorinated lime, or other disinfectant, before removal from the sick-room.

For this purpose chlorinated soda is the neatest and most convenient, because it can be used with soap, but it is apt to lose its disinfecting properties by age. Chlorinated lime, if used too freely, may destroy articles of clothing with which it comes in contact, but if properly used it is the safest as a disinfectant.

THE DISCHARGES FROM THE PATIENT should be received into vessels containing "chloride of lime," copperas, or some other known disinfectant,† and the same buried at once, and not by any means be thrown into a running stream, or into a cess-pool, or a water-closet, except after having been thoroughly disinfected. All vessels should be kept scrupulously clean and disinfected.

PERFECT CLEANLINESS of nurses and attendants should be enjoined and secured. As the hands of nurses, of necessity, become frequently contaminated by the poison of the disease, a good supply of towels, and two ba-

* That this is of more importance than in a case of small pox is indicated by the fact of the much greater number of cases of sickness and of deaths from scarlet fever—a disease in which there is no such preventive known as vaccination. In scarlet fever the period of invasion occupies from six to forty-eight hours, or, exceptionally, three days; the eruption is completed in from five to eight days; desquamation commences on the fourteenth or fifteenth day, and lasts from fifteen to twenty-six days. Isolation should last forty days, and no pupil should be allowed to attend school unless provided with a certificate of a physician that such isolation has been had.

† Carbolic acid in dilute form, as generally used, is not believed to be a disinfectant.

sins—one containing solution of chlorinated soda (Labaracque's solution), chloride of lime, or other disinfecting solution, and another for plain soap and water, should be always at hand and freely used.

PERSONS WHO ARE ATTENDING upon children or other persons suffering from scarlet fever, and also the members of the patient's family, should not mingle with other people, nor permit the entrance of children into their house.

FUNERALS of those dying from scarlet fever should be strictly private and the corpse not exposed to view. To avoid mistakes, *notices* of such deaths in the papers *should state* that the deceased died of scarlet fever, that there may be a full comprehension of the character of the disease. No form of scarlet fever is devoid of danger, however simple the early symptoms, or trifling the course of the disease, for most serious results have followed the most simple cases.

ALL PERSONS RECOVERING FROM SCARLET FEVER SHOULD BE CONSIDERED DANGEROUS, and, therefore, SHOULD NOT ATTEND SCHOOL, CHURCH, OR ANY PUBLIC ASSEMBLY, OR USE ANY PUBLIC CONVEYANCE, so long as any scaling or peeling of the skin (desquamation) or soreness of the eyes or air-passages, or symptoms of dropsy remain. No person recovering from scarlet fever should thus endanger public health, nor appear in public until after having taken four times, at intervals of two days, a thorough bath. This *cleansing*, however, *should be deferred* until the *physician in charge considers it prudent*. After recovery from scarlet fever, no person should appear in public wearing the same clothing worn while sick with, or recovering from, this disease.

GASEOUS DISINFECTION, OR FUMIGATION, can only be completely and entirely effectual in the absence of living persons, as fumes strong enough for the purpose are destructive of human life. This need not deter from doing as much as possible, without injury to sick persons, for the purification of the air of rooms occupied by them—a liberal supply of pure air should be secured; but after the sick have recovered, the room, furniture, and other contents not to be destroyed, should be thoroughly exposed for several hours to strong fumes of chlorine gas, or to fumigation by burning sulphur; or the paper on the walls, if any, removed and burnt, the furniture scrubbed or polished, and the room thoroughly scrubbed and whitewashed.

WHEN A ROOM AND CONTENTS ARE TO BE DISINFECTED, all articles therein should be spread out so as to expose the greatest amount of surface to the action of the disinfectant, *and all openings to the room should be closed.*

TO GENERATE CHLORINE, take peroxide of manganese (to be obtained at any drug store), place in an earthen dish and add one pound of hydrochloric acid (sometimes called muriatic acid), to each four ounces of the peroxide of manganese. Care should be taken not to inhale the gas. After being certain that continuous evolution of chlorine has been secured, leave the room and close the door of exit.

The bleaching properties of chlorine may destroy the color of colored goods exposed to it, but as a disinfectant it is one of the best.

TO GENERATE SULPHUROUS ACID GAS.—Put brimstone, broken in small lumps (at least two pounds for a room 10x10 feet, and this proportion for larger rooms) in an iron vessel; pour over the brimstone a small quantity of kerosene, apply a match, and close the door twenty-four hours.

Rooms subject to the action of disinfecting gas should be thoroughly aired by opening all the doors and windows.

HEAT AS A DISINFECTANT.—It is believed that heat sufficient to be disinfectant for this disease may be secured without destroying ordinary articles of clothing, say at 240° to 250° F.

WHENEVER A CASE OF THIS DISEASE OCCURS in a locality, prompt and vigorous action should be taken for the restriction of the disease, by early isolation of those sick with the disease, and by the destruction or disinfection of all articles likely to be infected.

PLAIN AND DISTINCT NOTICES SHOULD BE PLACED UPON THE PREMISES OR HOUSE in which there is a person sick with scarlet fever, and NO CHILD THAT HAS NOT HAD THE DISEASE SHOULD BE ALLOWED TO ENTER, or to associate with persons who enter such house or room.

HOUSEHOLDERS, PHYSICIANS, AND BOARDS OF HEALTH, HAVE DUTIES TO THE PUBLIC, and in order that the guardians of the public health may have early warning, it is important that every case of scarlet fever be promptly reported to the local board of health.

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

"Whenever any *physician* shall know that any person whom he is called to visit is infected with the small-pox, scarlet fever, diphtheria, *or any other disease dangerous to the public health*, such physician shall immediately *give notice* thereof to the board of health, or health officer of the township (city or town) in which such diseased person may be; and every physician who shall refuse or neglect to give such notice, shall forfeit, for each offense, a sum not exceeding twenty-five dollars."*

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

Local boards of health should also make such regulations as they may deem necessary for the public health and safety respecting any *articles which are capable of containing or conveying any infection or contagion, or of creating any sickness*, or when such articles shall be brought into or conveyed from

* Local boards should adopt these regulations, and give public notice thereof. The board, or any member thereof, may prosecute violations as provided in chapter 151, Laws of 1880, section 23.

their township, or into or from any vessel; and if any person shall violate any such regulation he should forfeit a sum not less than twenty dollars.

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

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

THE LOCAL BOARD OF HEALTH and the physician in charge of cases of this disease should co-operate for its restriction. The local board of health should particularly guard against its spread where no intelligent physician is employed.

ALL CLOTHING, CARPETS, CURTAINS, FURNITURE, and other substances that are to be destroyed, should be dealt with in a way to avoid conveying the poison to any person in the process; they should not be simply thrown away, or into some stream or body of water; and, if burned, should be completely burned, and not simply heated or dealt with in a way to diffuse the poison of the disease.

ALL SUCH INFECTED SUBSTANCES which are not destroyed should be thoroughly boiled, subjected to a dry heat of 250° F. in a closed room or disinfecting oven, or be thoroughly exposed to fumes of chlorine or of burning sulphur. *Books and furs* that have been handled by those convalescing from this disease *are particularly liable to convey the poison* to children who have never had the disease. Great care should be used to thoroughly disinfect any such articles that are not destroyed; and caution should be exercised before allowing children who have not had scarlet fever to handle any such articles that have been used by persons liable to communicate the disease. The Massachusetts State Board of Health states that prolonged boiling of clothing and bedding thoroughly disinfects them.

FRESH AIR.—Although not so active for the destruction of the contagium as is chlorine or sulphurous acid gas, pure air, in liberal amount, is a very useful and important agent for the dilution and destruction of the poison of the disease; it should be employed freely; but with this, as with other procedures for the safety of the unaffected, great care should be taken not to increase the danger to those already sick from any cause, who are usually endangered by exposure to draughts of cold air, and this is especially true of persons convalescing from scarlet fever.

HOW TO AVOID AND PREVENT SCARLET FEVER.

Avoid the special contagium of the disease. This is especially important

to be observed by children and all whose throats are sore from any cause. Children under ten years of age are in much greater danger of death from scarlet fever than are adults, but adult persons often get and spread the disease, and sometimes die from it. Mild cases in adults may thus cause fatal cases among children. Because of these facts it is frequently dangerous for children to go where adult persons go with almost perfect safety to themselves.

Do not let a child go near a case of scarlet fever. Do not permit any person or animal to come, or anything to be brought, directly from a case of scarlet fever to a child. Unless your services are needed, keep away from the disease yourself. If you do visit a case, bathe yourself and change and disinfect your clothing before you go where there is a child.

It is probable that the contagium of scarlet fever may retain its virulence for some time, and be carried a long distance in various substances and articles in which it may have found lodgment. While it is not definitely proved that the germs of scarlet fever are propagated in any substance outside the living human or animal body, it is possible that they may be found to be thus propagated. Therefore, and because the breathing of air laden with emanations from decaying meat, or from sewers, cess-pools, sinks, and other receptacles of filth, is believed to endanger health, great care should be taken to have the house, premises, and everything connected with dwellings, kept clean and dry; to have sewer-connections well trapped, and house-drains constantly well ventilated, and to have all carriers of filth well disinfected. Do not permit a child to enter a privy or water-closet, or breathe the air from a privy, water-closet, cess-pool, or sewer, into which non-disinfected discharges from persons sick with scarlet fever have entered, nor to drink water or milk which has been exposed to such air.

Do not permit a child to ride in a hack or other closed carriage in which has been a person sick with scarlet fever, except the carriage has since been thoroughly disinfected with fumes of burning sulphur, as specified.

Do not permit a pupil of a public school to re-enter school without a certificate of a physician that the proper precautions have been observed.

Do not permit a child to attend school from any family or building in which there is a case of scarlet fever, or has been such, within a period of forty days previous. Public schools are a most prolific source for the spread of this disease.

Do not wear or handle clothing worn by persons during their sickness or convalescence from scarlet fever.

Beware of any person who has a sore throat. Do not kiss such a person, nor take the breath of such a person. Do not drink from the same cup, nor use any article that has been used by a person sick with this disease.

HOW LONG PATIENTS SHOULD BE ISOLATED.—To a query addressed by the French Minister of Public Instruction to the Paris Academy of Medicine, as to how long a child affected with contagious disease should be kept away from school, the reply was:

1. Pupils stricken with chicken-pox, small-pox, scarlet fever, measles, mumps, or diphtheria should be strictly isolated from their comrades.

2. For small-pox, scarlet fever, measles, and diphtheria, isolation should not be shorter than forty days; for chicken-pox and mumps, twenty-five days is enough.

3. Isolation should last until after the patient has been bathed.

4. The clothing worn by the patient at the time he was taken sick should be subjected to a temperature of 90° C. (194° F.), and to sulphur vapor, and then well scoured.

5. The pupil of a school, after recovery from one of the above contagious diseases, should not be readmitted to the school unless furnished with the certificate of a physician that the above precautions have been observed.

With the view of lessening the number of cases of deaths from scarlet fever in Iowa, the foregoing is published by the State Board of Health for distribution throughout the State. Physicians being to some extent the custodians, and, as a matter of fact, effective conservators of the public health, copies of this document are also sent to the physicians in Iowa, in the hope and with the expectation that they will aid in diffusing among the people such knowledge of the nature of scarlet fever as will enable the people better to co-operate with them, and with boards of health, for the restriction of the disease and decrease of sickness and deaths therefrom.

Copies of this circular, and similar circulars for the prevention of small-pox and dipththeria, may be had on application to the State Board of Health, Des Moines.

NOTE.—In order that this document may do the greatest possible good, it is hoped that each one who receives it will not only make such use of it as will tend to disseminate most widely the suggestions contained therein, but will also *act for the restriction or prevention of Scarlet Fever* in accordance with its suggestions, or by other effective measures.

It may seem to the public that these rules are numerous and unimportant, but the State Board would be derelict in duty did it fail to set forth all means in its power to prevent the appalling mortality among children from this disease. It is, therefore, with confident belief in the complete efficacy of the regulations presented, that they are recommended for complete observance.

Any communication on the subject may be addressed to STATE BOARD OF HEALTH, DES MOINES, IOWA.

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

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

EXPENSES OF LOCAL BOARDS.

During the past two years much difficulty has arisen throughout the State as to how and in what manner the expenses of local boards of health are to be paid. An opinion given by the Attorney-general June 28, 1880, did not seem to meet the exigencies which have arisen under practical operation of Chapter 151, Laws of 1880. Upon this point the statute is not specific nor plain. The Supreme Court, however, has, in a case brought before it, so construed the statute as to settle the question in cases where it is necessary for local boards of health to take measures to prevent the spreading of contagious diseases. The decision was printed as a circular, and distributed among the county officers of the State, and health officers of local boards. The full text will be found in this Report.

SMALL-POX.

The prevalence of small-pox throughout the State during the year 1881–2 elicited considerable correspondence with this office, regarding the most effectual measures to prevent the spread of the disease, especially in the public schools. The following circular was therefore issued:

[FORM 35B.]

STATE OF IOWA—HEALTH DEPARTMENT.

OFFICE OF THE IOWA STATE BOARD OF HEALTH,
DES MOINES, November 15, 1882.

At the regular meeting of the State Board of Health, November 1, 1882, the following resolution was unanimously adopted;

Resolved, That the State Board of Health recommend to local boards of health, and trustees of public schools throughout the State, the *compulsory vaccintion of all unprotected children* attending the schools on the outbreak of an epidemic of small-pox in the neighborhood.

On motion, the Secretary was instructed to furnish clerks of local boards of health with a copy of the resolution.

R. J. FARQUHARSON.
Secretary.

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

REPORTS OF HEALTH OFFICERS

AND CLERKS OF LOCAL BOARDS.

For the year 1881, three hundred and forty-three clerks of townships and fifty-nine cities and towns, one hundred and fifty-one health officers made reports to this office of contagious diseases. This is an increase over the previous year, but is far from satisfactory, being less than one half the number of organized local boards of health. It is, however, gratifying to know that progress is made. The following tables are therefore given, not as even approximating correctness as to the State at large, but to show the ultimate object of their compilation. The information sought, if fully rendered, would furnish the data by which the condition of every county and township in the State could be known, and by comparison be ascertained what, when, and where, "diseases dangerous to the public health" prevail, and the most suitable means for their prevention.

NORTHEASTERN DIVISION—Continued.

1881. CITIES, TOWNS, AND TOWNSHIPS.	CITIES.		TOWNS.		TOWNSHIPS.				CASES OF DISEASES.																	
	Clerks that have reported.	Health Officers reported.	Clerks reported.	Health Officers reported.	Clerks reported.	Health Officers reported.	Total number Clerks reported.	Total number Health Officers reported.	Small-Pox.		Cholera.		Diphtheria.		Scarlet Fever.		Typhoid Fever.		Measles.		Whooping Cough.		Cerebro-Spinal Meningitis.	
									C.	H. O.	C.	H. O.	C.	H. O.	C.	H. O.	C.	H. O.	C.	H. O.	C.	H. O.	C.	H. O.
DELAWARE COUNTY—*Continued.*																								
Milo	....	....	....	....	1	....	....	....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....
North Fork	....	....	....	....	1	....	....	....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....
South Fork	....	....	....	....	1	....	....	....	....	.....	....	.....	4	.....	....	.....	....	.....	....	.....	....	.....	....	.....
DUBUQUE COUNTY—																								
Center	....	....	....	....	1	....	....	....	....	.....	....	.....	....	.....	....	.....	2	.....	....	.....	....	.....	....	.....
Dubuque	....	1	....	....	....	....	....	....	....	.....	....	.....	....	39	....	152	....	12	...	69	....	.....	....	4
Epworth	....	....	1	....	....	....	....	....	....	.....	....	.....	....	.....	....	.....	....	.....	50	.....	....	.....	....	.....
Jefferson	....	....	....	....	1	....	....	....	....	.....	....	.....	28	.....	7	20	....	1	...	.....	....	.....	....	.....
Peru	....	....	....	....	1	1	....	....	....	.....	....	.....	22	1	12	18	33	....	....	.....	....	.....	....	.....
Prairie Creek	....	....	....	....	1	1	....	....	....	.....	....	.....	....	.....	....	2	2	....	....	.....	....	.....	....	.....
Table Mound	....	....	....	....	1	....	....	....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....
Washington	....	....	....	....	....	1	....	....	1	.....	....	.....	....	12	....	12	....	5	....	.....	....	.....	....	.....
FAYETTE COUNTY—																								
Auburn	....	....	....	....	1	....	....	....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....
Eden	....	....	....	....	1	1	....	....	....	.....	....	.....	....	1	....	.....	....	5	....	35	....	12	....	.....
West Union	....	....	....	1	....	....	....	....	....	.....	....	.....	....	13	....	10	....	.....	....	16	....	.....	....	.....
Fayette	....	....	....	1	....	....	....	....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....
Fremont	....	....	....	....	1	....	....	....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....
Fayette	....	....	1	....	....	....	....	....	....	.....	....	.....	....	.....	....	.....	7	7	34	34	20	20	....	.....
Jefferson	....	....	....	....	1	....	....	....	....	.....	....	.....	8	.....	1	.....	....	.....	18	.....	....	.....	....	.....
Smithfield	....	....	....	....	1	....	....	....	....	.....	....	.....	....	.....	....	.....	....	.....	1	.....	1	.....	....	.....
HOWARD COUNTY—																								
Paris	....	....	....	....	1	....	....	....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....
Vernon Springs	....	....	....	....	1	....	....	....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....

WINNESHIEK COUNTY—																								
Calmar	....	....	1	....	....	....	....	....	....	.....	....	.....	....	.....	....	.....	2	.....	....	.....	....	.....	....	.....
	2	2	5	....	52	23	....	....	1	.....	....	52	136	207	202	634	15	60	234	911	24	147	....	14

EASTERN DIVISION.

BENTON COUNTY—																								
Benton	....	....	....	....	1	....	....	....	....	.....	....	.....	3	.....	15	.....	....	.....	....	.....	30	.....	....	.....
Bruce	....	....	....	....	1	....	....	....	....	.....	....	.....	3	.....	....	.....	5	.....	....	.....	....	.....	....	.....
Canton	....	....	....	....	1	....	....	....	....	.....	....	.....	....	.....	5	.....	....	.....	....	.....	....	.....	....	.....
Harrison	....	....	....	....	1	....	....	....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....
Homer	....	....	....	....	1	....	....	....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....
Iowa	....	....	....	....	....	1	....	....	....	.....	....	.....	....	.....	....	5	....	.....	....	.....	....	.....	....	.....
Kaws	....	....	....	....	1	....	....	....	....	.....	....	.....	....	.....	....	.....	....	.....	1	.....	....	.....	....	.....
Leroy	....	....	....	....	1	....	....	....	4	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....
Benton	....	....	....	....	....	1	....	....	....	.....	....	.....	....	6	....	3	....	.....	....	.....	....	2	....	.....
Monroe	....	....	....	....	1	....	....	....	....	.....	....	.....	7	.....	....	.....	....	.....	....	.....	....	.....	....	.....
Polk	....	....	....	....	1	....	....	....	....	.....	....	.....	15	.....	5	.....	....	.....	....	.....	....	.....	....	.....
Shellsburg	....	....	....	....	1	....	....	....	....	.....	....	.....	5	.....	5	.....	1	.....	....	.....	....	.....	....	.....
Taylor	....	....	....	....	1	....	....	....	....	.....	....	.....	14	.....	....	.....	....	.....	....	.....	....	.....	....	.....
CEDAR COUNTY—																								
Clarence	....	....	....	....	1	....	....	....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....
Center	....	....	....	....	1	....	....	....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....
Durant	....	....	....	....	1	....	....	....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....
Gower	....	....	....	....	1	....	....	....	....	.....	....	.....	....	.....	2	.....	3	.....	6	.....	....	.....	....	.....
Fairfield	....	....	....	....	1	....	....	....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....
Farmington	....	....	....	....	1	....	....	....	....	.....	....	.....	....	.....	1	.....	....	.....	....	.....	....	.....	....	.....
Fremont	....	....	....	....	1	....	....	....	....	.....	....	.....	....	.....	1	.....	2	.....	....	.....	....	.....	....	.....
Iowa	....	....	....	....	1	....	....	....	....	.....	....	.....	....	.....	11	.....	3	.....	....	.....	....	.....	....	.....
Inland	....	....	....	....	1	....	....	....	....	.....	....	.....	5	.....	....	.....	1	.....	....	.....	....	.....	....	.....
Iowa	....	....	....	....	1	....	....	....	....	.....	....	.....	....	.....	11	.....	3	.....	....	.....	....	.....	....	.....
Linn	....	....	....	....	1	....	....	....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....
Lowden	....	....	....	....	....	1	....	....	....	.....	....	.....	....	2	3	.....	....	.....	....	.....	....	30	....	.....
Mechanicsville	....	....	....	....	....	1	....	....	....	.....	....	.....	....	.....	10	.....	....	.....	....	.....	....	7	....	.....
Pedee	....	....	....	....	....	1	....	....	....	.....	....	.....	....	.....	10	.....	....	3	....	.....	....	.....	....	.....
Pioneer	....	....	....	1	....	....	....	....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....
Pioneer	....	....	....	....	....	1	....	....	....	.....	....	.....	....	12	....	.....	....	.....	....	.....	....	15	....	.....
Sugar Creek	....	....	....	....	....	1	....	....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....
Red Oak	....	....	....	....	1	....	....	....	....	.....	....	.....	....	.....	....	.....	1	.....	....	.....	....	.....	....	.....
Rochester	....	....	....	....	1	....	....	....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....
Springfield	....	....	....	....	....	1	....	....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....
West Branch	....	....	....	....	1	....	....	....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....

EASTERN DIVISION—CONTINUED.

1881.

CITIES, TOWNS, AND TOWNSHIPS.

CITIES, TOWNS, AND TOWNSHIPS.	CITIES. Clerks that have reported.	CITIES. Health Officers reported.	TOWNS. Clerks reported.	TOWNS. Health Officers reported.	TOWNSHIPS. Clerks reported.	TOWNSHIPS. Health Officers reported.	Total number Clerks reported.	Total number Health Officers reported.	CASES OF DISEASES. Small-Pox. C.	Small-Pox. H. O.	Cholera. C.	Cholera. H. O.	Diphtheria. C.	Diphtheria. H. O.	Scarlet Fever. C.	Scarlet Fever. H. O.	Typhoid Fever. C.	Typhoid Fever. H. O.	Measles. C.	Measles. H. O.	Whooping Cough. C.	Whooping Cough. H. O.	Cerebro-Spinal Meningitis. C.	Cerebro-Spinal Meningitis. H. O.
CLINTON COUNTY—																								
Camanche			1		1		2						1											
Clinton	1						1																	
Liberty					1		1						9											
Lyons	1				1		2						12											
IOWA COUNTY—																								
English					1		1										1							
Fillmore					1		1								4									
Greene					1		1																	
Lenox					1		1						13											
Pilot					1		1								3									
York					1		1																	
JACKSON COUNTY—																								
Bellevue			1				1						15											
Brandon					1		1																	
Butler					1		1																	
Farmers' Creek					1		1																	
Jackson					1		1						4											
Otter Creek					1		1								7									
Richland					1		1						3						4					
JOHNSON COUNTY—																								
Iowa City	1						1										1							
Jefferson													1				1				4			
Liberty													4											
Madison													3											

Newport																								
Sharon																								
Washington			1		1		2																	
JONES COUNTY—																								
Greenfield			1				1						1				1							
LINN COUNTY—																								
Buffalo					1		1						3											
College					1		1																	
Fayette					1		1																	
Fairfax					1		1																	
Franklin					1		1																	
Grant					1		1																	
Jackson					1		1																	
Marion					1		1																	
Otter Creek					1		1																	
Putnam					1		1																	
Rapids					1		1																	
Washington					1		1																	
Western					1		1																	
MUSCATINE COUNTY—																								
Lake			1				1																	
Muscatine									6															
Pike			1				1																	
Wapsinonoc					1		1																	
West Liberty					1		1																	
SCOTT COUNTY—																								
Blue Grass			1				1		1															
Buffalo			1				1																	
Butler			1				1																	
Cleona			1				1																	
Hickory Grove			1				1		2															
Le Claire					1		1																	
Le Claire					1		1																	
Lincoln					1		1																	
Rockingham					1		1																	
Sheridan					1		1																	
Princeton					1		1																	
	3	1	3	3	60	22			33	7	3	91	136	136	261	26	65	21	19	110	168	2	19	

SOUTHEASTERN DIVISION.

1881. CITIES, TOWNS, AND TOWNSHIPS.	CITIES. Clerks that have reported.	CITIES. Health Officers reported.	TOWNS. Clerks reported.	TOWNS. Health Officers reported.	TOWNSHIPS. Clerks reported.	TOWNSHIPS. Health Officers reported.	Total number Clerks reported.	Total number Health Officers reported.	CASES OF DISEASES. Small-Pox. C.	Small-Pox. H. O.	Cholera. C.	Cholera. H. O.	Diphtheria. C.	Diphtheria. H. O.	Scarlet Fever. C.	Scarlet Fever. H. O.	Typhoid Fever. C.	Typhoid Fever. H. O.	Measles. C.	Measles. H. O.	Whooping Cough. C.	Whooping Cough. H. O.	Cerebro-Spinal Meningitis. C.	Cerebro-Spinal Meningitis. H. O.
DES MOINES COUNTY—																								
Mediapolis					1	1									13	12			1	1	5	6		
Washington					1																			
Yellow Springs					1	1									1	6								
HENRY COUNTY—																								
Baltimore					1	1												2				1	1	1
Center					1	1							5	30		14	13	15	2	60		31		
Canaan					1				3						3			1	4					
Marion					1																			
Mt. Pleasant	1	1							8	8				1	1			1						1
Scott			1	1	1								1					3					1	
Salem																								
Trenton					1									608				25		40				
Wayne					1								F				F							
JEFFERSON COUNTY—																								
Black Hawk					1												1							
Des Moines					1																			
Fairfield			1	1										4				7				25		
Liberty					1																			
Round Prairie					1	1							3	25			1	1		3				
Polk					1																			
Walnut					1																11			
KEOKUK COUNTY—																								
Jackson						1																		
Keota				1									10		24							12		

Lancaster						1							2	1										
Richland						1																		
Sigourney				1										6		4		7				25		
Sigourney					1																			
Van Buren						1										10		2						2
LEE COUNTY—																								
Cedar					1	1								30		3								
Denmark					1	1							3		1		4	3		22				
Fort Madison		1								1							3			50				
Green Bay					1																			
Madison						1																		
West Point					1	1														16				
LOUISA COUNTY—																								
Concord					1	1																		
Columbus City					1																			
Columbus City			1																					
Elliott					1																			
Elm Grove					1																			
Grand View			1	1																				
Grand View					1	1												6						
Jefferson					1																			
Maine					1								48											
Morning Sun					1																			
VAN BUREN COUNTY—																								
Cedar					1										3				4		6			
Henry					1								1											
Lick Creek					1																			
Village					1	1								1		1				2				
WASHINGTON COUNTY—																								
Cass					1								2		2								1	
English River					1								3		3		4							
Iowa						1								2		2								1
Lime Creek					1													8						
Marion					1																			
Seventy-Six					1																			
Washington		1														2								1
Washington						1																		1
	1	3	2	5	37	19			11	9			78	718	51	54	34	72	11	194	22	100	3	7

(F.) The clerk reports very indefinitely "a few cases of measles and diphtheria."

NORTHERN DIVISION.

1881. CITIES, TOWNS, AND TOWNSHIPS.	CITIES. Clerks that have reported.	CITIES. Health Officers reported.	TOWNS. Clerks reported.	TOWNS. Health Officers reported.	TOWNSHIPS. Clerks reported.	TOWNSHIPS. Health Officers reported.	Total number Clerks reported.	Total number Health Officers reported.	CASES OF DISEASES. Small-Pox. C.	Small-Pox. H. O.	Cholera. C.	Cholera. H. O.	Diphtheria. C.	Diphtheria. H. O.	Scarlet Fever. C.	Scarlet Fever. H. O.	Typhoid Fever. C.	Typhoid Fever. H. O.	Measles. C.	Measles. H. O.	Whooping Cough. C.	Whooping Cough. H. O.	Cerebro-Spinal Meningitis. C.	Cerebro-Spinal Meningitis. H. O.
BUTLER COUNTY—																								
Beaver					1	1										25		3		40		2		1
Jefferson					1																			
Madison					1																			
Shell Rock				1																				
Washington					1								1											
CERRO GORDO COUNTY—																								
Bath					1																			
Clear Lake				1														2		4				1
Clear Lake					1	1												1						
Lake					1	1																		
Mason City	1	1												10				6		6		50		
Owen					1																			
Pleasant Valley					1										7		1		3					
Union					1	1							1	2										
FLOYD COUNTY—																								
St. Charles					1																			
FRANKLIN COUNTY—																								
Geneva					1	1							1											
Greene																								
Lee					1																			
Marion					1																			
Morgan					1								2		2		1							
Mott					1																			
Osceola					1												1							

Reeve					1								1											
Richland					1								8											
HANCOCK COUNTY—																								
Amsterdam					1												1							
Boone					1																			
Ellington					1										3									
HUMBOLDT COUNTY—																								
Norway					1																			
Vernon					1								13						2			1		
KOSSUTH COUNTY—																								
Algona				1										10		6				10				
Lott's Creek					1																			
Cresco					1																			
Ramsey					1												9							
Irvington					1								6											
Wesley					1																			
MITCHELL COUNTY—																								
St. Ansgar					1	1								1			1							
Wayne					1								1											
Rock					1																			
Burr Oak					1								1											
WINNEBAGO COUNTY—																								
Mt. Valley					1																			
WRIGHT COUNTY—																								
Blaine					1	1																		
Eagle Grove					1																			
Clarion					1																			
Norway					1																			
Troy					1	1																		
	1	1		3	39	8							35	23	12	31	14	12	5	60	1	52	2	

CENTRAL DIVISION.

BOONE COUNTY—																								
Boonsboro			1																					
Colfax				1																				
Garden					1																			
Jackson																								
Union					1	1									10	10		3				7		

CENTRAL DIVISION—CONTINUED.

1881. CITIES, TOWNS, AND TOWNSHIPS.	CITIES.		TOWNS.		TOWNSHIPS.				CASES OF DISEASES.																	
	Clerks that have reported.	Health Officers reported.	Clerks reported.	Health Officers reported.	Clerks reported.	Health Officers reported.	Total number Clerks reported.	Total number Health Officers reported.	Small-Pox.		Cholera.		Diphtheria.		Scarlet Fever.		Typhoid Fever.		Measles.		Whooping Cough.		Cerebro-Spinal Meningitis.	
									C.	H. O.	C.	H. O.	C.	H. O.	C.	H. O.	C.	H. O.	C.	H. O.	C.	H. O.	C.	H. O.
DALLAS COUNTY—																								
Adel				1																				
Cass																								
Dexter			1																					
Grant					1																			
GRUNDY COUNTY—																								
Beaver					1								6						4					
Colfax					1						1		14											
German					1								8		2									
Reinbeck			1										10		4									
HAMILTON COUNTY—																								
Boone					1																			
Fremont					1																			
HARDIN COUNTY—																								
Cedar Falls	1												3		3									
Eldora			1																					
JASPER COUNTY—																								
Fairview					1	1							3	3				5						
Independence					1	1							4	4								40		
Monroe				1																				
Newton					1																			
Poweshiek						1																		
MARSHALL COUNTY—																								
Linn					1	1																		
Greencastle					1	1																		

Iowa					1																			
Liscomb					1																			
Linn					1																			
Timber Creek					1																			
POLK COUNTY—																								
Allen					1	1				1		1	14	10										
Douglas					1																			
Lincoln													3											
Madison																								1
Sheldahl				1										8										
Walnut						1										2								
POWESHIEK COUNTY—																								
Chester					1											5								
Deep River						1									1		2							
Lincoln					1												1			25				
Malcolm				1										2			4		25		1			
Malcolm					1	1							20		1									
Warren					1										1									
STORY COUNTY—																								
Ames				1												5		3						1
Grant					1																			
Nevada				1										1				3				1		2
Palestine					1								2											
Richland					1																			
TAMA COUNTY—																								
Clarke						1							13		3						12			
Geneseo					1										1		1							
Indian Village						1							3						3		22			
Oneida					1																			
Otter Creek					1	1								1		2	1	5		10				
Richland					1	1								3		6								1
Salt Creek					1																			
	1		4	5	33	6	7				1	1	103	32	32	30	9	19	32	35	35	48		5

SOUTHERN DIVISION.

1881. CITIES, TOWNS, AND TOWNSHIPS.	CITIES.		TOWNS.		TOWNSHIPS.				CASES OF DISEASES.															
	Clerks that have reported.	Health Officers reported.	Clerks reported.	Health Officers reported.	Clerks reported.	Health Officers reported.	Total number Clerks reported.	Total number Health Officers reported.	Small-Pox.		Cholera.		Diphtheria.		Scarlet Fever.		Typhoid Fever.		Measles.		Whooping Cough.		Cerebro-Spinal Meningitis.	
									C.	H. O.	C.	H. O.	C.	H. O.	C.	H. O.	C.	H. O.	C.	H. O.	C.	H. O.	C.	H. O.
APPANOOSE COUNTY—																								
Caldwell					1								3											
Douglas					1																			
Moulton				1									2								6			
Sharon					1																			
Union					1																			
Walnut					1	1																		
Washington					1									2				3						
CLARKE COUNTY—																								
Doyle					1	1							5	5	1	1	4	15						
Franklin					1												1							
Knox					1	1							2	2						8				1
Washington					1																			
DAVIS COUNTY—																								
Bloomfield			1	1									20	20				8	150	150				
Grove					1								3		5									
Marion					1								1											
Union					1									5				10	25	40				
DECATUR COUNTY—																								
Garden Grove					1	1								4										
Garden Grove			1	1										3	3									
Hamilton					1																			
Long Creek					1	1								15								3		
Woodland					1								3											

LUCAS COUNTY—																								
Cedar					1																			
Otter Creek					1	1												3						
Warren					1								3										1	
Washington					1																			
MADISON COUNTY—																								
Grand River					1																			
Jackson						1																		
Lincoln					1																			
Ohio					1												2							
Scott					1																			
MAHASKA COUNTY—																								
White Oak						1												2				2		2
Oskaloosa					1																			
Prairie					1																			
Madison					1																			
MARION COUNTY—																								
Perry					1												1							
Franklin																								
Swan					1																			
Knoxville	1																							
Knoxville					1																			
MONROE COUNTY—																								
Buffalo					1																2			
Lovilla					1																			
WAPELLO COUNTY—																								
Adams					1	1						5		6	10	7		5	2	5	8			
Allen						1																		
Cass					1																			
Greene					1												2							
Polk					1																			
WARREN COUNTY—																								
Linn					1																			
WAYNE COUNTY—																								
Lineville				1										6		3		3						
Jackson					1																			
Monroe					1																			
			2	4	40	10						5	48	72	16	4	6	46	182	206	5			4

NORTHWESTERN DIVISION.

1881. CITIES, TOWNS, AND TOWNSHIPS.	CITIES. Clerks that have reported.	CITIES. Health Officers reported.	TOWNS. Clerks reported.	TOWNS. Health Officers reported.	TOWNSHIPS. Clerks reported.	TOWNSHIPS. Health Officers reported.	Total number Clerks reported.	Total number Health Officers reported.	CASES OF DISEASES. Small-Pox. C.	Small-Pox. H. O.	Cholera. C.	Cholera. H. O.	Diphtheria. C.	Diphtheria. H. O.	Scarlet Fever. C.	Scarlet Fever. H. O.	Typhoid Fever. C.	Typhoid Fever. H. O.	Measles. C.	Measles. H. O.	Whooping Cough. C.	Whooping Cough. H. O.	Cerebro-Spinal Meningitis. C.	Cerebro-Spinal Meningitis. H. O.
BUENA VISTA COUNTY—																								
Coon					1														27					
Maple Valley					1																			
CHEROKEE COUNTY—																								
Spring					1																			
CLAY COUNTY—																								
Bridgewater					1																			
Gilletts' Grove					1																			
Herdland					1								28											
Lincoln					1														5					
Peterson					1																			
DICKINSON COUNTY—																								
Okoboji					1																			
EMMET COUNTY—																								
Armstrong Grove					1																			
Emmet					1																			
O'BRIEN COUNTY—																								
Baker					1																			
Center					1																			
Highland					1																			
Summit					1																			
Waterman					1												1							
OSCEOLA COUNTY—																								
Baker						1																		
Gilman					1												9							
Holman					1																			
PALO ALTO COUNTY—																								
Ellington					1												11							
Fairfield					1								5											
Fern Valley					1																			
Freedom					1																			
Highland						1																1		
Silver Lake					1												1							
PLYMOUTH COUNTY—																								
Portland					1								1											
POCAHONTAS COUNTY—																								
Belleville					1																		2	
Lizzard					1																			
SIOUX COUNTY—																								
Holland					1																			
Sioux					1																			
					28								34				22					1	2	

WESTERN DIVISION.

AUDUBON COUNTY—																								
Audubon						1														4				
Audubon			1																9					
Hamlin					1																			
CARROLL COUNTY—																								
Elm Grove																								
Kniest					1								28						1					
Lincoln					1																			
Logan					1								1											
Pleasant Valley					1																			
Richland					1																			
Warren					1																			

WESTERN DIVISION—CONTINUED.

1881. CITIES, TOWNS, AND TOWNSHIPS.	CITIES.		TOWNS.		TOWNSHIPS.				CASES OF DISEASES.																	
	Clerks that have reported.	Health Officers reported.	Clerks reported.	Health Officers reported.	Clerks reported.	Health Officers reported.	Total number Clerks reported.	Total number Health Officers reported.	Small-Pox.		Cholera.		Diphtheria.		Scarlet Fever.		Typhoid Fever.		Measles.		Whooping Cough.		Cerebro-Spinal Meningitis.	
									C.	H. O.	C.	H. O.	C.	H. O.	C.	H. O.	C.	H. O.	C.	H. O.	C.	H. O.	C.	H. O.
CRAWFORD COUNTY—																								
Denison					1																			
Goodrich					1																			
Morgan					1																			
Nishnabotna					1																			
Paradise					1																			
Soldier					1								8											
Stockholm					1																			
Willow					1								13						2					
GREENE COUNTY—																								
Cedar					1																			
Payton					1	1										5					20			
Washington					1																			
Willow					1																			
GUTHRIE COUNTY—																								
Baker					1																			
Bear Grove					1																			
Cass													6		6									
Orange						1																		
Panora			1	1									8	12				20			12			
Richland					1									2			3							
Thompson					1																			
Union					1																			
HARRISON COUNTY—																								
Cass					1								1											
Dunlap					1								1											
Dunlap				1										1		4								

Harrison					1																			
Jefferson					1																			
Lincoln					1																			
Logan						1											1							
Logan			1																					
Union					1																			
Woodbine					1						1													
IDA COUNTY—																								
Battle					1																			
Grant					1																			
Logan					1	1											1							
MONONA COUNTY—																								
Cooper					1								8											
Fairview					1								23											
Franklin					1								2											
Sherman					1								1											
SAC COUNTY—																								
Boyer Valley					1	1								6		6		12		20		18		1
Eureka					1																			
Jackson					1																			
SHELBY COUNTY—																								
Cass					1																			
Fairview					1								5											
Shelby					1								4									1		
WEBSTER COUNTY—																								
Clay					1																			
Cooper					1																			
Freeborn						1																		
Fulton					1																			
Gowrie			1		1																			
Lost Grove					1																			
Sumner					1								28	54			3		5		6			
WOODBURY COUNTY—																								
Allen					1																			
Concord					1								7											
Sioux City		1											11	30		32		63		102		101		10
Sioux City					1																			
Sloan					1																			
Total		1	4		54	7					1	15	138	75	6	47	5	95	17	128		157	1	11

SOUTHWESTERN DIVISION.

1881. CITIES, TOWNS, AND TOWNSHIPS.	CITIES.		TOWNS.		TOWNSHIPS.				CASES OF DISEASES.															
	Clerks that have reported.	Health Officers reported.	Clerks reported.	Health Officers reported.	Clerks reported.	Health Officers reported.	Total number Clerks reported.	Total number Health Officers reported.	Small-Pox.		Cholera.		Diphtheria.		Scarlet Fever.		Typhoid Fever.		Measles.		Whooping Cough.		Cerebro-Spinal Meningitis.	
									C.	H. O.	C.	H. O.	C.	H. O.	C.	H. O.	C.	H. O.	C.	H. O.	C.	H. O.	C.	H. O.
ADAIR COUNTY—																								
Eureka	....	....	....	....	1	....	....	....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....
Quincy*	....	....	....	....	1	....	....	....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....
Walnut	....	....	....	....	....	1	....	....	....	.....	....	.....	....	10	....	.....	....	8	....	.....	....	10	....	.....
CASS COUNTY—																								
Atlantic	....	1	....	....	....	....	....	....	....	.....	....	.....	....	60	....	58	....	20	....	145	....	20	....	5
Massena	....	....	....	....	1	....	....	....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....
FREMONT COUNTY—																								
Sidney	....	....	....	....	....	1	....	....	....	.....	....	.....	....	.....	....	.....	6	.....	....	.....	....	1	....	.....
Tabor	....	....	....	....	....	1	....	....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....
MILLS COUNTY—																								
Silver Creek	....	....	....	....	1	....	....	....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....
MONTGOMERY COUNTY—																								
Frankford	....	....	....	....	1	....	....	....	....	.....	....	.....	1	.....	....	.....	....	.....	8	.....	....	.....	....	.....
PAGE COUNTY—																								
Amity	....	....	....	....	1	....	....	....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....
Buchanan	....	....	....	....	1	....	....	....	....	.....	7	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....
Clarinda	....	1	....	....	....	....	....	....	....	.....	....	.....	....	3	....	.....	....	5	....	37	....	63	....	1
College Springs	....	....	....	....	1	....	....	....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....
East River	....	....	....	....	....	....	....	....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....
Essex	....	....	1	....	....	....	....	....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....
Harlan	....	....	....	....	1	....	....	....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....
Nodaway	....	....	....	....	1	....	....	....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....

*Dr. T. A. Jeffreys reports fourteen cases of diphtheria in his practice.

POTTAWATTAMIE COUNTY—																								
Avoca	....	....	1	....	....	....	....	....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....
Belknap	....	....	....	....	1	1	....	....	....	.....	....	.....	3	3	....	.....	....	.....	9	50	....	40	....	.....
Boomer	....	....	....	....	1	....	....	....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....
James	....	....	....	....	1	....	....	....	....	.....	....	.....	29	.....	....	.....	....	.....	....	.....	....	.....	....	.....
Keg Creek	....	....	....	....	1	....	....	....	....	.....	....	.....	....	.....	....	.....	3	.....	....	.....	....	.....	....	.....
RINGGOLD COUNTY—																								
Mt. Ayr	....	....	1	....	1	....	....	....	....	.....	3	3	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....
TAYLOR COUNTY—																								
Clayton	....	....	....	....	1	....	....	....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....
Dallas	....	....	....	....	1	....	....	....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....
Gay	....	....	....	....	1	....	....	....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....
Holt	....	....	....	....	....	....	....	....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....
Nodaway	....	....	....	....	1	....	....	....	....	.....	....	.....	....	.....	....	.....	1	.....	....	.....	....	.....	1	.....
Polk	....	....	....	....	1	....	....	....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....
Ross	....	....	....	....	1	....	....	....	....	.....	....	.....	4	.....	....	.....	....	.....	....	.....	....	.....	....	.....
UNION COUNTY—																								
Jones	....	....	....	....	1	....	....	....	....	.....	....	.....	18	.....	....	.....	....	.....	....	.....	....	.....	....	.....
Sand Creek	....	....	....	....	1	....	....	....	....	.....	1	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....
Spaulding	....	....	....	....	1	....	....	....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....	....	.....
	....	2	2	....	24	4	....	....	....	.....	11	3	55	76	....	58	10	33	17	237	....	.....	149	.....

[TABLE II.]

AGGREGATE OF CASES OF CONTAGIOUS DISEASES BY COUNTIES FOR THE YEAR 1881.

COUNTIES.	CITIES AND TOWNS.			TOWNSHIPS.			CASES OF DISEASES.							
	Number in county.	Number Clerks reported.	Number Health Officers reported.	Number in county.	Number Clerks reported.	Number Health Officers reported.	Small-Pox.	Cholera.	Diphtheria.	Scarlet Fever.	Typhoid Fever.	Measles.	Whooping Cough.	Cerebro-Spinal Meningitis.
Adair	4	....	4	19	2	1	....	....	10	....	....	8	....	10	....
Adams	2	....	....	12	....	....	....	....	....	....	....	....	....	....	....
Allamakee	2	....	2	18	7	2	....	....	....	72	....	6	....	5	....
Appanoose	4	....	....	18	6	1	....	....	7	....	....	3	....	6	....
Audubon	1	1	1	12	1	1	....	....	....	....	....	....	13	....	....
Benton	4	....	11	22	....	2	4	....	47	38	7	1	32	....	....
Black Hawk	3	1	....	18	6	2	....	....	88	276	6	502	50	....	2
Boone	2	1	....	17	3	2	....	....	....	10	3	....	7	....	....
Bremer	1	1	....	14	3	2	....	....	9	....	2	6	....	1	....
Buchanan	1	....	2	16	5	2	....	....	26	65	1	201	....	7	....
Buena Vista	4	....	....	16	2	....	....	....	....	....	....	27	....	....	....
Butler	7	1	1	16	4	1	....	....	1	25	3	40	2	1	....
Calhoun	5	....	....	16	....	....	....	....	....	....	....	....	....	....	....
Carroll	5	....	....	17	6	....	....	....	29	....	....	1	....	....	....
Cass	4	1	....	16	....	1	....	....	60	58	20	145	20	5	....
Cedar	6	....	2	17	14	6	....	....	29	39	16	6	32	....	....
Cerro Gordo	4	1	2	16	6	3	....	....	12	7	10	13	50	1	....
Cherokee	4	....	....	16	1	....	....	....	....	....	....	....	....	....	....
Chickasaw	3	....	2	12	1	2	....	2	....	....	1	1	....	....	....
Clarke	3	4	2	12	....	....	....	....	7	1	16	8	....	1	....
Clay	1	....	....	14	5	....	....	....	28	....	....	5	....	....	....
Clayton	4	6	....	22	10	6	....	....	72	1	16	131	60	1	....
Clinton	8	3	....	22	3	....	....	11	14	3	....	....	....	....	....
Crawford	4	....	....	20	8	....	....	....	21	....	....	2	....	....	....
Dallas	8	1	1	16	1	....	....	....	....	....	....	....	....	....	....
Davis	2	1	1	15	3	....	....	....	29	....	18	190	....	....	....
Decatur	3	1	1	17	4	2	....	....	25	....	....	....	3	....	....
Delaware	3	....	....	16	8	3	....	....	4	5	2	19	....	....	....
Des Moines	2	....	....	12	3	2	....	....	....	18	....	1	5	6	....
Dickinson	1	....	....	12	1	....	....	....	....	....	....	....	....	....	....
Dubuque	5	1	1	18	5	3	....	50	63	219	17	119	....	4	....
Emmet	1	....	....	9	2	....	....	....	....	....	....	....	....	....	....
Fayette	1	1	2	21	5	1	....	....	22	11	12	85	33	....	....
Floyd	4	....	....	12	1	....	....	....	....	....	....	....	....	....	....
Franklin	2	....	2	18	8	1	....	....	12	2	2	....	....	....	....
Fremont	8	....	....	14	....	Poor	....	....	....	....	6	....	1	....	....
Greene	3	....	....	15	4	1	....	....	....	5	....	....	20	....	....
Grundy	2	1	....	14	3	....	....	1	38	6	....	4	....	....	....
Guthrie	5	1	1	17	5	....	....	....	20	6	23	....	12	....	....
Hamilton	1	....	....	15	2	....	....	....	....	....	....	....	....	....	....
Hancock	2	3	....	16	....	....	....	....	....	....	....	....	....	....	....
Hardin	8	2	....	15	....	....	....	....	3	3	....	....	....	....	....
Harrison	6	1	1	20	7	1	1	....	3	....	5	....	....	....	....
Henry	5	2	1	12	6	3	....	....	639	14	46	100	32	3	....
Howard	2	....	....	12	2	....	....	....	....	3	1	....	....	....	....
Humboldt	3	2	....	13	....	....	....	....	13	....	....	2	....	1	....
Ida	3	....	....	12	3	1	....	....	....	....	1	....	....	....	....
Iowa	3	5	....	18	....	....	....	....	....	4	1	....	....	....	....
Jackson	6	1	....	18	4	3	15	....	7	7	12	....	35	....	....

AGGREGATE OF CASES—CONTINUED.

COUNTIES.	CITIES AND TOWNS.			TOWNSHIPS.			CASES OF DISEASES.							
	Number in county.	Number Clerks reported.	Number Health Officers reported.	Number in county.	Number Clerks reported.	Number Health Officers reported.	Small-Pox.	Cholera.	Diphtheria.	Scarlet Fever.	Typhoid Fever.	Measles.	Whooping Cough.	Cerebro-Spinal Meningitis.
Jasper	5	....	1	19	4	2	....	....	7	....	5	....	....	40	....
Jefferson	2	1	....	11	....	2	....	....	29	....	9	3	36	....	....
Johnson	3	1	....	21	6	1	....	....	21	....	3	....	8	....	....
Jones	4	....	....	16	1	....	....	....	1	....	1	....	....	....	....
Keokuk	6	....	2	16	1	4	....	....	17	38	9	....	37	....	....
Kossuth	1	1	....	11	5	....	....	....	16	6	9	10	....	....	....
Lee	5	....	1	16	4	4	1	....	33	4	7	88	143	1	....
Linn	7	....	....	20	10	2	....	....	88	30	10	17	....	....	....
Louisa	7	2	1	12	8	1	....	....	48	....	6	....	....	....	....
Lucas	1	....	....	12	4	1	....	....	3	....	3	....	....	1	....
Lyon	4	....	....	13	....	....	....	....	....	....	....	....	....	....	....
Madison	4	....	....	17	4	1	....	....	....	....	....	2	....	....	....
Mahaska	4	....	....	17	3	1	....	....	....	....	2	....	2	2	....
Marion	4	1	....	15	3	....	....	....	....	....	1	....	....	....	....
Marshall	1	....	....	19	6	1	....	....	....	....	....	....	....	....	....
Mills	6	1	....	14	1	....	....	....	....	....	....	....	....	....	....
Mitchell	5	....	....	15	4	1	....	....	....	....	1	....	1	....	....
Monona	2	....	....	19	4	....	....	....	....	....	34	....	....	....	....
Monroe	2	....	....	12	1	....	....	....	....	....	....	....	2	....	....
Montgomery	3	1	....	12	1	....	....	....	1	....	....	8	....	....	....
Muscatine	3	1	1	14	2	2	....	....	6	....	16	230	46	2	....
O'Brien	2	....	....	16	5	....	....	....	....	....	....	....	1	....	....
Osceola	1	....	....	9	2	1	....	....	....	....	....	....	9	....	....
Page	8	1	1	16	5	....	....	....	7	....	3	....	5	37	63
Palo Alto	1	....	....	15	5	1	....	....	....	....	5	....	12	....	1
Plymouth	1	....	....	23	1	....	....	....	....	....	1	....	....	....	....
Pocahontas	2	....	....	16	2	....	....	....	....	....	....	....	....	....	2
Polk	8	....	1	21	2	2	....	....	1	1	25	2	....	....	1
Pottawattamie	7	1	....	28	4	1	....	....	....	....	32	....	3	50	45
Powesheik	5	....	1	16	4	2	....	....	....	....	22	14	7	50	1
Ringgold	1	1	....	17	1	....	3	....	....	....	....	....	....	....	....
Sac	3	....	....	16	3	1	....	....	....	....	6	6	12	20	18
Scott	4	1	....	15	10	1	3	3	6	36	1	14	8	1	....
Shelby	3	....	....	16	3	....	4	....	5	....	....	....	....	....	1
Sioux	1	....	....	16	2	....	....	....	....	....	....	....	....	....	....
Story	7	....	2	16	3	....	....	....	....	....	3	5	6	....	1
Tama	7	....	....	21	4	4	....	....	....	....	20	12	6	13	32
Taylor	6	....	....	17	6	....	....	....	....	....	4	....	1	....	....
Union	2	....	....	12	3	....	1	....	....	....	18	....	....	....	....
Van Buren	6	....	....	14	4	1	....	....	....	....	2	4	....	6	6
Wapello	5	....	....	14	4	2	5	....	10	7	5	10	....	....	....
Warren	3	....	....	17	1	....	....	....	....	....	....	....	....	....	....
Washington	3	....	1	17	5	2	....	....	7	9	12	....	....	....	4
Wayne	5	....	1	16	2	....	....	....	6	3	3	....	....	....	....
Webster	3	1	....	23	6	1	....	....	28	....	3	5	6	....	....
Winnebago	2	....	....	7	1	....	....	....	....	....	....	....	....	....	....
Winneshiek	4	1	....	20	....	....	....	....	....	....	2	....	....	....	....
Woodbury	3	1	....	23	5	....	11	....	37	32	63	102	101	10	....
Worth	1	....	....	12	....	....	....	....	....	....	....	....	....	....	....
Wright	3	....	....	15	5	2	....	....	....	....	....	....	....	....	....
Total	363	59	51	1589	343	101	75	56	1913	1341	514	1959	946	121	

DISEASES IN IOWA---SPECIAL CORRESPONDENCE.

To secure more accurate and reliable knowledge of diseases in Iowa, and causes which may be supposed to affect the rate of sickness or death, the following circular was sent to special correspondents:

[CIRCULAR 23 B.]

OFFICE OF THE STATE BOARD OF HEALTH,
DES MOINES, July 20, 1882.

To Special Correspondents of the State Board of Health:

GENTLEMEN—This Board desires to have, and to place upon record for purposes of future study in connection with records of deaths and of meteorological conditions, statements, for as many different localities in the State as possible, of the diseases in Iowa during the year 1881. Will you have the kindness to send, as soon as is convenient, your replies to the following questions? Please use the stamped envelope inclosed herewith, and leave all additional postage to be paid at this office. In replying, it will not be necessary to repeat the questions, but simply to refer to the circular by number and to each question by number.

1. Do you live in a city or incorporated town? What do you estimate the number of inhabitants of said city or town July 1, 1881?

2. Among the inhabitants above mentioned, what do you estimate the number of deaths from all causes during the year 1881?

3. Please state the territory for which your replies to the following questions are made.

4. Among the people of your locality, considering the increase or decrease of population, was the amount of *sickness* from all causes during the year ending December 31, 1881, *greater*, *less*, or about *the same as the average* during the previous years? If not the same, how much was it increased or diminished?

5. Compared with previous years, and from all causes, was the ratio of *deaths* to inhabitants during the year 1881, *grenter*, *less*, or about *the same as the average?* If not the same, how much was it increased or diminished?

6. What diseases or causes of death were *more* than usually prevalent during the year 1881?

7. If you can assign any *cause for* the *unusual prevalence* of any disease, please do so.

8. What diseases or causes of death were *less* than usually prevalent?

9. To what do you attribute the lessened prevalence?

10. From what diseases or causes was there *more* than the usual mortality during the year 1881?

11. If you can assign any *cause for* the *unusual mortality* from any disease, please do so.

12. From what diseases or causes was there *less* than the usual mortality?

13. To what do you attribute the lessened mortality?

14. Please mention dates of the occurrence in 1881 of all diseases attended with an *unusually high rate of mortality*, and state whether the rate was high or low.

15. Please mention dates of the occurrence in 1881 of all diseases attended with an *unusually low rate of mortality*, and state whether the rate was high or low.

16. Please give names and dates of the occurrence in 1881 of all *diseases not usually occurring in your locality.*

17. State number of cases of each of these diseases, viz.: small-pox, cholera, scarlet fever, typhoid fever, measles, whooping-cough, cerebro-spinal meningitis, diphtheria, and any other epidemic, endemic, contagious or infectious disease that appeared during 1881. (Facts are especially desired, but opinions are better than no statements, though it will be well to state them as opinions.)

18. Of the eight diseases mentioned in No. 17, *name those of which no case appeared* during the year 1881.

19. For each of the months in 1881, please give a summary statement of the diseases which occurred, naming them in the order of their prevalence—greatest first.

20. Has the attendance on the public schools in your neighborhood, in 1881, spread any of the diseases mentioned in No. 17?

21. During the year 1881, what diseases occurred, at what time, and to what extent among animals? Describe the character of the disease.

22. Give a summary statement of the meteorological conditions during the year 1881, specifying the general character for each month, and note any peculiar or unusual conditions.

23. Please state the facts concerning the *soil moisture* in your locality, during each of the months in the year 1881, *without reference to previous years*, but comparing the months, in 1881, with each other. Group them in order —driest first.

24. *Compared with previous years* in what months of the year 1881 was the *soil* in your locality *unusually dry.*

25. *Compared with previous years* in what months of the year 1881 was the *soil* in your locality *unusually moist.*

26. What was the average depth of water in wells in your locality, in each month of the year 1881.

27. In your locality, what is the *usual average depth of earth above the ground water*, as indicated by distance down to water in wells, streams, etc.? If different parts of your locality vary greatly, please answer for such different parts.

28. Without reference to previous years, please state the facts concerning the *depth of earth above the ground water* nearest the surface, in your locality, during each month of the year 1881, as indicated by the distance down to water in wells, streams, etc., or by other facts. How many feet and inches do you estimate it, in each month.

29. Compared with previous years, in what months of the year 1881 was the *ground water* in your locality *unusually high?*

30. Compared with previous years, in what months of the year 1881 was the *ground water* in your locality *unusually low?*

31. Please communicate facts bearing upon, or cases illustrating the causation or communicability of diseases. Illustrate localities, if possible, by diagram, or drawings.

32. Were there any accidents from the use of kerosene oil, petroleum, gasoline, or other product of petroleum, in your locality during the year? Give the facts, and if any person was injured or killed, give their name. The State Board is especially desirous to obtain all possible information on this subject, that it may be presented to the next Legislature, for the purpose of securing a change in the law for the better protection of the people against dangerous illuminating oils.

Any suggestions which you may feel inclined to make, concerning methods which seem practicable, for the prevention of sickness and deaths, in your locality, need not be withheld, but are earnestly solicited.

As stated after question 17, in the absence of positive knowledge, opinions are desired. The fact that it will be difficult, and sometimes impossible, to give the information asked for is well understood; the importance of the subject, however, warrants the effort which it is believed will not always be barren of results, but will tend to accumulate data which eventually will be of great value to the people.

By direction of the State Board of Health.

Very truly,

R. J. FARQUHARSON,
Secretary.

To this circular the following responses have been made. For convenience they have been grouped in geographical divisions. (See map.)

The State Board of Health assumes no responsibility for statements or opinions given by correspondents. They have been, however, selected with caution, and comprise many physicians of high rank in the profession.

GEOGRAPHICAL DIVISIONS OF THE STATE,

Giving a List of the counties in each Division, and population in 1880, and Arranged for the study of the causes of Sickness and Death.

MISSISSIPPI SECTION.

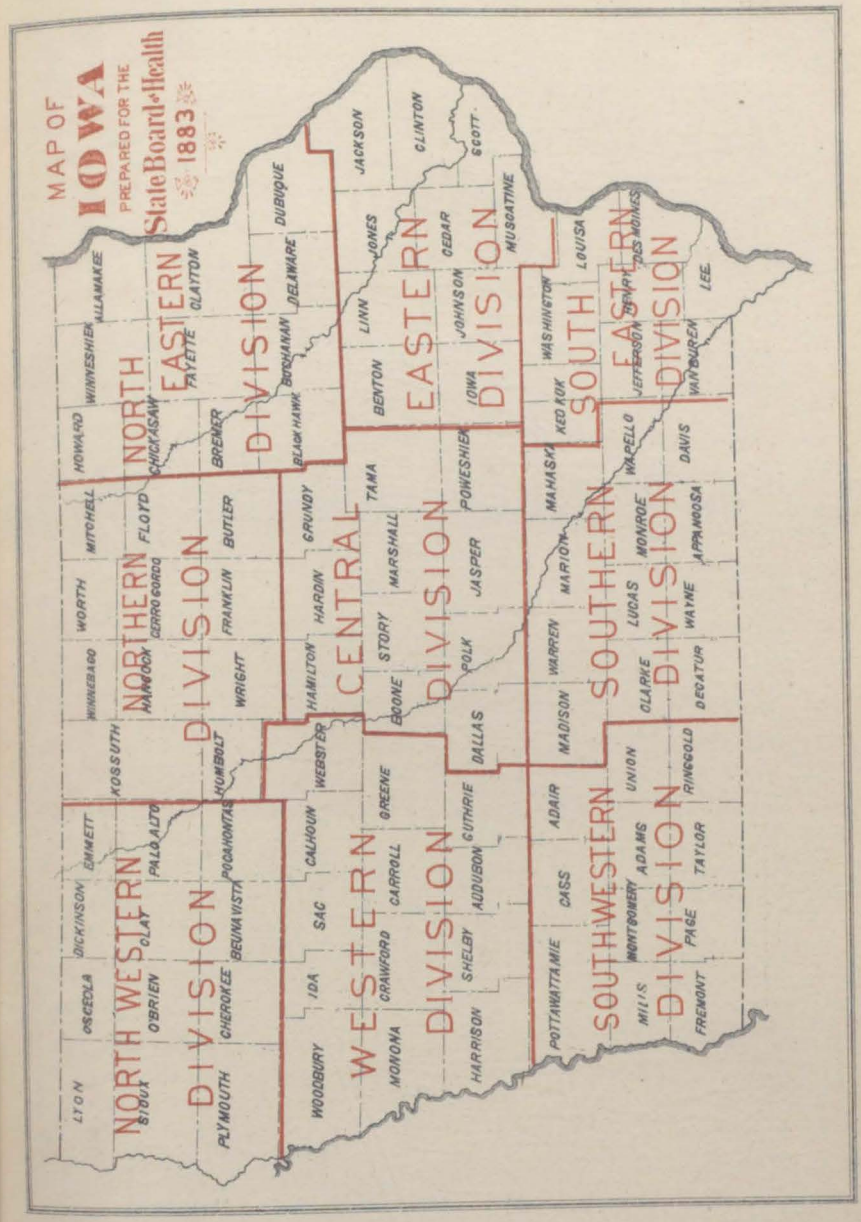
NORTHEASTERN DIVISION.	POPULATION.	EASTERN DIVISION.	POPULATION.	SOUTHEASTERN DIVISION.	POPULATION.
Allamakee	19,791	Benton	24,888	Des Moines	33,099
Black Hawk	23,913	Cedar	18,936	Henry	20,986
Bremer	14,081	Clinton	36,763	Jefferson	17,469
Buchanan	18,546	Iowa	19,221	Keokuk	21,258
Chickasaw	14,534	Jackson	23,771	Lee	34,859
Clayton	28,829	Johnson	25,429	Louisa	13,142
Delaware	17,950	Jones	21,052	Van Buren	17,043
Dubuque	42,996	Linn	37,237	Washington	20,374
Fayette	22,258	Muscatine	23,170		
Howard	10,837	Scott	41,266		
Winneshiek	23,938				
	237,673		271,733		178,230

MIDDLE SECTION.

NORTHERN DIVISION.	POPULATION.	CENTRAL DIVISION.	POPULATION.	SOUTHERN DIVISION.	POPULATION.
Butler	14,293	Boone	20,838	Appanoose	16,638
Cerro Gordo	11,461	Dallas	18,746	Clarke	11,513
Floyd	14,677	Grundy	12,639	Davis	16,468
Franklin	10,248	Hamilton	11,252	Decatur	15,336
Hancock	3,453	Hardin	17,807	Lucas	14,530
Humboldt	5,341	Jasper	25,963	Madison	17,224
Kossuth	6,178	Marshall	23,752	Mahaska	25,202
Mitchell	14,363	Polk	42,395	Marion	25,111
Winnebago	4,917	Poweshiek	18,936	Monroe	13,719
Worth	7,953	Story	16,906	Wapello	25,285
Wright	5,062	Tama	21,585	Warren	19,578
				Wayne	16,127
	97,947		230,819		216,729

MISSOURI SECTION.

NORTHWESTERN DIVISION.	POPULATION.	WESTERN DIVISION.	POPULATION.	SOUTHWESTERN DIVISION.	POPULATION.
Buena Vista	7,537	Audubon	7,448	Adams	11,888
Cherokee	8,240	Calhoun	5,595	Adair	11,667
Clay	4,248	Carroll	12,351	Cass	16,943
Dickinson	1,901	Crawford	12,413	Fremont	17,652
Emmet	1,556	Greene	12,727	Mills	14,137
Lyon	1,968	Guthrie	14,394	Montgomery	15,895
O'Brien	4,155	Harrison	16,649	Page	19,667
Osceola	2,219	Ida	4,382	Pottawattamie	39,850
Palo Alto	4,131	Monona	9,052	Ringgold	12,085
Plymouth	8,566	Sac	8,774	Taylor	15,635
Pocahontas	3,713	Shelby	12,696	Union	14,980
Sioux	5,426	Webster	15,951		
		Woodbury	14,996		
	53,654		147,427		190,309



NORTHEASTERN DIVISION.*

REPLIES OF A. A. MATHEWS, M. D., OF DYERSVILLE, DUBUQUE COUNTY.

†1. Dyersville is an incorporated town of one thousand inhabitants. It is in the western edge of Dubuque county, and is situated on both sides of the north branch of the Maquoketa river, sufficiently high to secure thorough drainage. Our streets are always clean and the cellars are dry, and for these reasons we have less sickness and it is of a milder nature than farther west of us.

2. About ten.

3. Dyersville and the surrounding country, included by a radius of about four miles.

4. The amount of sickness on an average during the year was rather less than usual.

5. The number of deaths was less than the average.

6. Diphtheria caused more deaths than in any former year during my practice here, although it never existed as an epidemic.

7. Can assign no cause.

8. Cannot say.

9. Cannot answer.

10. Diphtheria.

11. Diphtheria was worst in February, when the weather had been cold for a long time. Decomposing vegetables in the cellars at this time and imperfect ventilation, caused by the doors and windows being kept tightly closed on account of the cold weather, no doubt aggravated the cases.

12 and 13. Cannot answer.

14. A number died in February of diphtheria, but the rate of mortality was not high considering the number of cases.

15 and 16. Do not remember any.

17. A few cases of scarlet fever, typhoid fever, whooping-cough, and probably twenty cases of diphtheria.

18. Small-pox, cholera, measles, cerebro-spinal meningitis.

19. Cannot.

20. No.

21. The disease known as "pink-eye" occurred quite generally among the horses in the fall and early winter. Many suffered with it very lightly, and only very few died.

22. Cannot.

23. Cannot.

24. In the end of May and the first weeks of June.

25. In the end of September and the beginning of October.

26. Cannot state.

27. On the east side of the river wells are from thirty to fifty feet deep—some are deeper. On the west side they are from twenty to thirty feet deep.

28. Cannot.

29. In October.

30. In June.

31. Have nothing to offer.

32. No accidents or deaths to report from any of the substances mentioned.

Had one death occur from tetanus, caused by the toy pistol, which destructive weapon deserves a place among those you enumerate.

Respectfully submitted,

A. A. MATHEWS, M. D.

Dyersville, Dubuque county.

* For counties in this division see map, page 156.

† The figures beginning each paragraph, refer to questions in Circular 23B, on page 152.

REPLIES OF O. N. HOYT, M. D., OF CRESCO, HOWARD COUNTY.

*1. Cresco is incorporated. Population 1,900.
2. Twelve.
3. For city of Cresco only.
4. Amount of sickness about the same as for previous years.
5. Number of deaths about the average.
6. Parotitis and pulmonary consumption.
7. The year 1881 was not characterized by an unusual amount of sickness nor prevalence of any particular disease, except mumps in January and February.
17. There were occasional cases of scarlet and typhoid fevers, measles, whooping-cough, cerebro-spinal meningitis and diphtheria.
18. There were no cases of cholera nor small-pox.
10. In *January*, *February* and *March*, there were many cases of perotitis, and pneumonia was prevalent. In the summer and fall seasons there was quite a tendency to malaria and rheumatic affections, but not so much sickness among children as was expected, considering the wet weather.
20. I think not.
21. In the summer and fall of 1881 there was a disease among hogs that resulted in death to some. About one-half were lost in some lots. Their heads would begin to swell; they would choke and cough, would go to a cool place if it could be found, and, perhaps, die. There was some "black-leg" among cattle, but comparatively few were attacked. During the fall many horses were indisposed from sore and swelled ankles and legs. This trouble was called "pink-eye" by some, although most of the horses thus affected showed no redness in the eyes. There were a few well marked cases of pink-eye.
22. Taken from the monthly record of G. Marshall.

January.—Mean temperature 4.2° above zero; melted snow one inch; on the 9th and 10th the thermometer marked 40° below zero.

February.—Mean temperature 14° above; melted snow and iec.

March.—Mean temperature 26° above, which was below the average; melted snow and rain, 1.3 inches.

April.—Mean temperature 40°; rain and melted snow, 1.6 inches; total snow for the winter, 41 inches.

May.—Mean temperature 64°, the hottest in ten years; there was frost on the 2d; amount of rain, 3.2 inches.

June.—Mean temperature, 66.2°; rain, 3.1 inches; there were ten thunder storms in this month.

July.—Mean temperature, 0.72°; there were nine thunder storms in July.

August.—Rain-fall, 4.4 inches; temperature not given.

September. — Mean temperature, 61.4°; rain-fall, 10 inches; the wettest September known in twenty years; a heavy wind and rain storm from the southwest on the eve of the 29th, which did much damage to buildings, corn and stacks.

October.— Mean temperature 48°, higher than the average; rain-fall, 8.1 inches; the usual amount is one to two inches; there were sixteenrainy days in October.

November.—Mean temperature, 29°; rain and melted snow, 1.7 inches.

December.—Mean temperature, 27°; rain and melted snow, one inch; the highest temperature for the year 1881 was 98° on August 5. The lowest was on January 14, 40° below zero; total amount of rain and melted snow for the year, 44 inches.

23. The ground was frozen in January, February, November and December, but owing to light snow-fall the soil moisture would have been slight.

March, April, May and June presented the usual amount of ground moisture. During July, August, September and October the ground was more than moist; it was wet—thoroughly saturated.

24. None.
25. July, August, September and October.
26. From two to four feet in January, February, March, April, May, June and December; from ten to forty feet, according to locality in July, August, September, October and November.
27. The distance down to water varies much in this locality. Water is usually found in limestone and at depths varying from twenty to fifty feet.
28. During January, February, March, April, May, June and December from twenty to fifty feet; July, August and November, fifteen to thirty feet; September and October, from eight to fifteen feet.
29. In July, August, September, October and November.
30-32. None.

As before stated, there was no malignancy of disease in this vicinity during 1881, but in the north and west parts of the county there were quite a number of cases of diphtheria which proved malignant and contagious. I am convinced that laws should be passed isolating cases of diphtheria and compelling the disinfecting of houses in which the disease has been.

Very truly,

O. N. HOYT, M. D.

Cresco, August 15, 1882.

* The figures beginning each paragraph, refer to questions in Circular 23B, on page 152.

REPLIES FROM FREDERICK BECKER, M. D., OF CLERMONT, FAYETTE COUNTY.

*1. In the incorporated town of Clermont, which had July 1, 1881, about 675 inhabitants.
2. From all causes during the year 1881, in our town, were three.
3. For the town of Clermont, except where otherwise noted.
4. About the same as in other ordinary years.
5. Less, by about fifty per cent.
6. None.
7. There was no unusual prevalence of any diseases during the year.
8. We had no diphtheria and but little typhoid fever.
9. The soil in our locality is sandy and very rolling, and the heavy rain-falls moved all decaying matter rapidly.

The following answers will include Clermont township.

10. From none.
11. There has been no unusual rate of mortality from any cause in this locality.
12. From typhoid fever.
13. Our heavy rain-falls removed decaying matter rapidly during our typhoid fever season.
14. No diseases were accompanied by an unsually high rate of mortality.
15. During January, February, and March, there were many cases of pneumonia, pleuritis, and bronchitis, and during September and October dysentery was very prevalent, both with low rate of mortality.
16. Cerebro-spinal meningitis in April and May.
17. Small-pox, none; Asiatic cholera, none; typhoid fever, six cases; measles, none; whooping-cough, none; cerebro-spinal meningitis, two cases; diphtheria, none; parotitis, a good many cases.
18. Small-pox, Asiatic cholera, measles, whooping-cough, diphtheria.
19. *January*—Diarrhœa, pneumonia, bronchitis, pharyngitis, rheumatism, influenza, amenorrhea, intermittent fever, mastitis, dysentery.

February—Bronchitis, pneumonia, pharyngitis, diarrhœa, coryza, pleuritis, rheumatism, mastitis, cramps, dysmenorrhrea, nephritis, otitis.

March—Bronchitis, coryza, diarrhœa, pharyngitis, pleuritis, pneumonia, intermittent fever, rheumatism, ophthalmia.

April—Bronchitis, parotitis, pneumonia, pleuritis, dysmenrohœa, neuralgia, croup, coryza, diarrhœa, tonsilitis, rheumatism, cerebro-spinal meningitis.

May—Pleuritis, parotitis, intermittent fever, diarrhœa, pharnygitis, diarrhœa, scarletina, cerebro-spinal meningitis.

The figures beginning each paragraph, refer to questions in Circular 23B, on page 152.

June—Diarrhœa, intermittent fever, pharyngitis, pneumonia, ophthalmia, tonsilitis.
July—Diarrhœa, intermittent fever, congestion of brain, cystitis, parotitis, enteritis, enterocolitis.
August—Diarrhœa, dysentery, intermittent fever, congestion of brain, enteritis, parotitis, rheumatism gastro enteritis.
September—Diarrhœa, dysentery, bronchitis, intermittent fever, congestion of brain, amenorrhœa, gastro enteritis, pleuritis, ophthalmia, typhoid fever.
October—Dysentery, diarrhœa, amenorrhœa, gastro enteritis, ophthalmia, bronchitis.
November—Rheumatism, parotitis, bronchitis, pneumonia, tonsilitis, cystitis, typhoid pleuritis, diarrhœa.
December—Bronchitis, pnuemonia, erysipelas, rheumatism, amenorrhœa, dysmenorrhœa.

20. No, it has not.

21. September, October, November, December, pink-eye in horses, which was often attended with lameness and swelling of the legs; typho pneumonia in swine, with great mortality; and cholera in chickens, also attended with great mortality.

22. *January*—Clear and cold, with dry atmosphere; small amount of rain-fall (snow); only amounting to 0.70 inches.
February—Cold, with increased rain-fall (snow); 1.67 inches, with high winds during latter part of the month.
March—Cold and windy, fore part, with rain-fall (snow) to the amount of 1.11 inches. Latter part, occasional thawing.
April—Occasional thawing during fore part of month, with a rapid change to warm about the 16th of the month, which continued to the end of month. Rain-fall but little only 0.84 inches.
May—Fore part some cooler, latter part warm; rain-fall 2.03 inches.
June—Hot, with occasional thunder showers; rain-fall 4.74 inches.
July—Hot, with very heavy thunder-showers; rain-fall 11.12 inches.
August—Hot, and first half dry, second half warm with considerable rain-fall, to the amount of 3.22 inches.
September—Cooler, with very much rain-fall throughout the month, amounting to 10.51 inches.
October—Cool, rain-fall continuing at nearly the same rate as in September with cool winds. Rain-fall 9.47 inches.
November—Mild, with but little freezing, and decreased rain-fall 1.95 inches.
December—Colder and dry; rain-fall only 0.42 inches.

23. From the above statement of rain-fall which I am enabled to give you through the kindness of Miss G. Larrabee, our volunteer observer, you will see that we have had an unusual amount of rain-fall during the year 1881 in this locality, and also an unusual moisture of the soil. The greatest amount of soil moisture in each month during the year stands in the following order: November, October, April, September, December, August, July, May, June, March, February, January.

24. January.

25. November.

26. The wells in our locality vary in depth so much that an average depth of water cannot be correctly given, but it would correspond with the answers given to question 23.

27. From thirty-five to eighty-five feet.

28. Am not able to answer correctly and will therefore omit it.

29. November.

30. January.

31. Our town and immediate surroundings are located on Turkey river bottom, which has a number of sloughs and ponds of standing water; this, no doubt, is the cause of our intermittent fevers.

32. But one accident has occurred in our locality during the year from petroleum and its related oils; that one passed off so fortunately as not to injure either person or property, except the lamp which exploded. Kerosene oil was used in said lamp.

*The figures beginning each paragraph, refer to questions in Circular 23B, on page 152.

I have endeavored to give you as correct a statement as possible in the foregoing, nevertheless you will find many errors contained therein. The answers to question number 19 are taken from my case record and are nearly correct.

I am, gentlemen, your most obedient servant,

FREDERICK BECKER, M. D.

Clermont, Iowa, September 1, 1882.

REPLIES FROM J. W. RUE, M. D., OF DELHI, DELAWARE COUNTY.

*1. Town is not incorporated, but contains about 500 inhabitants.

2. About the same as 1880, or 1 to 200 inhabitants—one-half per cent.

3. My practice embraces about five square miles; of about 2,000 inhabitants, or thereabout.

4. About the same as previous years.

5. About the same as previous years.

6. Diphtheria and consumption seemed to take the lead in this locality.

7. I cannot answer.

8. Typhoid fever.

9. To a more strict attention to hygiene, and removing decaying vegetables from their cellars.

10. See No. 6.

11. Cannot answer.

12. Fevers—malarial and typhoid.

13. See No. 9.

14. Cannot answer accurately, but think diphtheria in spring and fall; consumption in the spring.

15. Cannot answer. Rate about same as 1880. Medium.

16. Swine-pox in fall; never was known here before.

17. Typhoid fever; five in my practice; presume there were more cases. Scarlet fever, 2; measles, 7; whooping-cough, 4; cerebro-spinal meningitis, 2 (both died); diphtheria, 3; swine-pox, 4. This disease did not spread, only those of the family and the servant woman, who did the washing of those who had the disease, taking it. It was brought here by visiting friends of the family.

18. Small-pox; cholera.

19. Cannot give an accurate statement.

20. Yes; measles and whooping-cough.

21. Among cats, resembling pneumonia. Among dogs and horses this resembled diffusive catarrh, effecting the head and throat. I also noticed similar symptoms in hogs. The cats and hogs, I think, all died. One peculiar symptom in all was a staggering (as in blind staggers) and running of the eyes. The dogs nearly all recovered.

22. March and April heavy rain-fall, with sudden change from warm to cold, with sleet. Did not note anything very unusual in the remainder of the year.

23. May, June and August were quite dry. January not much snow or rain. February, considerable snow all through the month. March, rainy; sudden changes from warm to cold sleet. April, rainy; sudden changes from warm to cold sleet. The remaining part of the year I did not note anything unusual.

24. June and August.

25. March, April and May, also October, were quite moist.

26. Some wells are twenty feet, and thirty to sixty-five feet. Did not note the changes for each month.

27. There is one well, one and a half miles from the village, which is 100 feet deep, or to the water I think the average is about forty-five feet.

28. Cannot answer correctly.

29 and 30. Cannot answer.

31. There is an establishment for the purpose of rendering hogs that die of cholera, and otherwise, about one mile or less from the village, which I think is very injurious to those who live near it, as the impurities which come from it are almost unbearable, and I have had some cases of fever caused by its presence.

32. There have been no serious accidents to my knowledge.

* The figures beginning each paragraph, refer to questions in Circular 23B, on page 152.

As a physician I could say many things which would be practicable, if it would go direct to the people, but as your reports go mostly to physicians, of whom I would not set myself up as a teacher, although there is room, and perhaps need, of suggestions and ideas that would be of interest to some. I would, therefore, suggest that there be issued in pamphlet form and circulated among the people, giving them ideas, suggestions, and some general instructions of methods and inexpensive ways of keeping cellars clean and out-houses, and embracing some of the most important points in hygiene, and the necessity of a *strict cleanliness* of the *household* and of their *persons*, *especially* those of children. Many mothers are not as careful as they ought to be in the matter of bathing the little ones and preparing them proper food, and in most cases the father is as much at fault as the mother.

Yours truly,

J. W. RUE, M. D.

Delhi, September 4, 1884.

REPLIES FROM E. RIETZ, M. D., OF SHERRILL'S MOUNT, DUBUQUE COUNTY.

*1. Sherrill's Mount, a township of 2,200 inhabitants. Practicing in Jefferson and Peru townships, including 4,000 inhabitants.
2. About two per cent.
3. A ridge with valleys near the Mississippi.
4. Of diseases about the same.
5. There were more. People of old age.
6. Cholera infantum, scarlet fever, diphtheretic croup and membranous croup, typhoid malaria.
7. Cold winter; much snow; houses kept too hot; mostly bad and unclean cellars; people visiting one another and extending disease; wrong nursing of babies; feeding children with unripe fruit; playing in mud pools; don't clothe themselves right; running around in the wet dew evenings and mornings when a heavy fog is extended in the valleys, in July, when the river repulses and the sloughs drying up, leaving a malignant smell; drinking unclean cistern water; having mud pools near the houses, and, last, wash their clothes every six months.
8. Small-pox, whooping-cough, cerebro-spinal meningitis, measles and febris typhoides.
9. Small-pox, whooping-cough, cerebro-spinal meningitis. Have not had any here since January. Measles and febris typhoides, but very few cases.
10. Febris scarlatina, membranous croup, febris typhoides.
11. Diseases named in No. 10 have not been present in such epidemic form as in the year 1881; causes assigned in No. 7.
12. Answered in No. 8.
13. Answered in No. 9.
14. During January, February, March till middle of April; from middle of July, August and September; from first of December. Mortality of most named low, because of all the cases of febris scarlatina lost five; cholera morbus, lost three; cholera infantum, lost nine; simple diphtheria, lost two; febris recurrent, lost one; croup, lost three. These cases I have been attending myself.
15. May, June, October and November, low.
16. From January first to middle of April, febris scarlat. diphtheria, membranous diphtheria, croup. From July to September, cholera morbus and infantum; from July to end of October, all classes of febris malarial; from December first to end of year, febris scarlat., diphtheria and croup.
17. Cholera morbus, 35; cholera infantum, 88; febris scarlat., 56; bilious typhoid, 5; diphtheria, 44; febris malaria, several hundred; intermittent typhoid, 1; febris recurrent, 15; febris pernicious, 5; croup, 12. These cases I attended myself.
18. Febris typhoides, measles, whooping-cough, cerebro-spinal meningitis.
19. In scarlet febris, diphtheria and croup, same as in No. 17. Cholera morbus and infantum, from middle of August to end of September the severest. Malarial diseases will not differ any in stated months. Intermittent, typhoid, febris recurrent, febris pernicious, occurred from middle of September till end of October.
20. No.
21. Hog diseases occurred August, September, October, November and December. What they name the disease I do not know; is generally called hog cholera; other particulars I cannot give.

DR. E. RIETZ.

Sherrill's Mount, August 30, 1882.

* The figures beginning each paragraph, refer to questions in Circular 23B, on page 152.

REPLIES FROM WM. H. FRANCIS, M. D., OF CASCADE, DUBUQUE COUNTY.

The following answers, some of which are necessarily imperfect, as questions of this nature are not answered by complete records, but as near correct as can be:

*1. Incorporated town; about 1,000 inhabitants.
2. About twenty.
3. Within a radius of five miles.
4. Sickness from all causes about the same as the average of previous years.
5. About the same as the average.
6. Scarlet fever and diphtheria were more prevalent.
7. Those cases of diphtheria which occurred in October I attributed to malaria, although confined to a few families, all in the same neighborhood.
8. Cannot say; about the same.
9. About the same.
10. Diphtheria. Had altogether about eight cases, two of which died. No diphtheria here for ten years past, until last season.
11. See No. 7.
12. Cannot say.
13. About the same; neither more nor less.
14. In October diphtheria; in February scarlet fever.
15. Cannot state that the rate of mortality was higher than former years.
16. Diphtheria does not usually occur here.
17. Small-pox and cholera *none*. Measles, scarlet fever, typhoid fever, and diphtheria, of each a few cases. Two cases of cerebro-spinal meningitis.
18. The above in 17; occurred in 1881.
20. No.
21. Do not know of any diseases in cattle in this locality in 1881.
22. No unusual meteorological conditions during 1881.
23. The soil was wet in the months of March, April, May, and June, a healthy moisture during July, and thus far into August.
24. No month unusually dry.
25. See No. 23.
26. Say from ten to fifteen in drilled wells.
27. Very little ground water here, except what is in streams and Maquoketa river. The locality is bluffy on the river; the bluffs vary in height, and the land rolling.
28. About the same as previous years.
29. In months of April and June our streams rise five or six feet above the level; high.
30. In months of September, October, and November.
31. In the fall of each year we have some intermittent fevers caused by stagnant water in an old slough adjacent to town.
32. No accidents from kerosene oil or any other illuminating oils.

Respectfully submitted,

WILLIAM H. FRANCIS, M. D.

Cascade, August 18, 1882.

* The figures beginning each paragraph, refer to questions in Circular 23B, on page 152.

REPLIES FROM JOHN SHEPHERD, M. D., OF POSTVILLE, ALLAMAKEE COUNTY.

*1. Incorporated town. Population about 850.
2. Nine. Cause—senile decay, 2; ramollisement, 1; consumption, 1; broncho-pneumonia, 1 (sequel of measles); cerebral meningitis, 1; cholera infantum, 1; renal disease; congenital deformity, 1.
3. In a radius of five miles, including part of counties of Allamakee, Clayton, Fayette and Winneshiek.
4. About the average.
6. No epidemic of any type of disease.
8. Typhoid fever.
9. Cannot assign a reason unless the unusual amount of rain, giving an unusual supply of purer water than in dry seasons.
10. No unusual mortality.
12. None.
15. The greatest number of cases of any particular type of disease which I shall call cholera infantum, occurred in August, September and October. Rate low.
16. Small-pox in December.
17. Genuine small-pox, 4; modified small-pox, 4; mild scarlatina 3 or 4; measles, 8 or 10; also malignant scarlet fever with diphtheria, 1; throat affections, some of which were called diphtheria, which I think might properly been called follicular pharyngitis, the number I cannot give; cerebral meningitis, 2.
18. Typhoid fever, cholera and whooping cough.
19. This is not presumed to be in the order of greatest prevalence, nor in any order. But in 1881 we had the usual diseases (except what is already stated) incident to the locality and climate, namely: pneumonia, bronchitis, pleurisy, croup, influenza, measles, scarlatina, erysipelas, the so-called diphtheria, tonsilitis follicular pharyngitis, stomatitis and rheumatism. Summer and winter cholera of adults, and cholera infantum and small-pox.
20. Not to my knowledge. The number and cause of deaths in the county within the limit stated, personally known and from information, 10, viz.: consumption, 2; cholera infantum, 2; cerebral meningitis, 1; malignant scarlet fever with diphtheria, 1; aphthæ with gastric irritation, 1 (infant); sudden, 1 (male); a positive diagnosis could not be made, and an autopsy was not permitted; said to be cancer of the stomach, 1; said to be hepatic disease, 1; ten and nine in number 2; total, 19.
21. Did not hear of any disease among cattle.
22. First three months continuous frost and snow and very cold, the thermometer frequently ranging from 15° to 30° below zero.

From about the middle of April, when it began to thaw, throughout the season the rain-fall was greater than usual, frequent thunder with heavy rains. August the dryest, September and October the wettest, November and December alternate rain and frost. Notwithstanding the great rain-fall the summer was very warm.

On the afternoon of the 26th of September a cyclone passed through the district from nearly southwest to northeast about one and a half miles from town at its nearest point; tore up and scattered everything in its track and did great damage to property.

23. August dryest; September and October wettest.
26. Don't know.
27. From a few inches to 2 or 3 feet.
28. Don't know.
29. See 23.
30. Not unusually low at any time.
32. None.

The town is rather low and level, and in very wet seasons, like 1881, there is water in almost every cellar, from a few inches to several feet, yet Postville is comparatively healthy and free from serious and frequent out-breaks of zymotic malignant diseases.

There is a slough through the center of the town from west to east, through, and from which the water is drained away by an open ditch which is kept clear, and conveys away the water so that no stagnant pools or lochs can form. Also all accumulations of manure, etc., in stable yards and alleys are thoroughly cleaned out in the spring.

The water supply in town for drinking and cooking is from wells dug or drilled and walled at a depth of from 15 to 25 feet. The same in the country, but some of them are much deeper, ranging according to locality from 35 to 80 feet. All the well-water is hard, on account of the lime-stone formation which exists all around here.

I regret the imperfections of this report; it indicates the character of the diseases we had, and the number of deaths, and the answers to other questions are as near correct as I can make them.

Respectfully submitted,

JOHN SHEPHERD, M. D.

Postville, Allamakee county, August 1, 1882.

* The figures beginning each paragraph, refer to questions in Circular 23B, on page 152.

REPLIES FROM E. CARTWRIGHT, M. D., OF DECORAH, WINNESHIEK COUNTY.

*1. City of second class containing about 3,700.
2. About 43. Decorah City and township six miles square.
4–5. Slightly increased, probably 20 per cent.
6. Diseases of respiratory tract.
8–9. Almost entire absence of autumnal diarrhea, both infantile and dysentery, which I attribute to moderate and even temperature.
17. Measles became epidemic in September and continued, visiting almost every household. I know there were 4 or 5 deaths, but none are reported.
18. There have also been at various times, from September on, cases of diphtheria, five of which, I believe, proved fatal, though two or three of these may have been in present year.
19. Only in measles and whooping cough. For other answers refer to last report.

I would recommend that such legislation be had as will make it a criminal offense to bury in any church yard, or cemetery without a certificate from a physician stating cause of death. The very temperate, although wet, fall, and open winter following, resulted in an unusual number of deaths from consumption, as also old age.

Respectfully,

E. CARTWRIGHT, M. D.

Decorah, Aug. 18, 1882.

* The figures beginning each paragraph, refer to questions in Circular 23B, on page 152.

REPLIES FROM G. D. DARNALL, M. D., OF WEST UNION, FAYETTE COUNTY.

*1. Incorporated town; about 1,800.
2. As near as I can ascertain about twenty-five.
3. Incorporated town and West Union township.
4. About the same as previous year.
5. Less than previous year, about twenty-five per cent.
6. Typho-malarial and typhoid fevers.
7. We had much rain the latter part of summer and during the fall. A heavy growth of vegetation sprang up which had to decompose. Many cellars in our town and township were filled with water, hence damp houses, etc.
8. Had less diphtheria than for three or four previous years.
9. A better sanitary condition, also more caution used on part of our people to prevent spreading contagious diseases.
10. Typhoid fever and consumption.
11. Answered in No. 7.
12. Had less mortality from diphtheria than for four or five former years.
13. Answered in No. 9.
14. Typhoid fever in October and November; mortality high for number of cases.
15. In January low mortality of diphtheria; also in September low mortality of scarlet fever.
16. No disease.
17. Probably a dozen cases of scarlet fever; typhoid fever, from twenty to thirty cases; whooping cough prevailed all the year; about fifteen cases of diphtheria during the year.
18. Small-pox, cholera, cerebro-spinal meningitis.
19. Diphtheria in January; scarlet fever in September; typhoid and typho-malarial fevers in October and November.
20. Whooping cough.
21. Pink-eye among horses.
22. No data.
23. January, February, March, April, May, June and July about usual soil moisture; August, September, October, November and December soil moisture greater than usual.
24. The month of July.
25. Latter part of August, September, October, November and December.
26. Average about 15 feet; however, it varied greatly, from 5 to 60 feet.
27. About 15 feet, but a variation of from 5 to 60 feet.
28. Until the middle of August about usual average; but the remainder of the year from 5 to 10 feet.
29. From middle of August to close of year.
30. If any difference, July.
31. No marked cases came under my notice.
32. None have come to my knowledge.

Yours respectfully.

G. D. DARNALL.

West Union, Sept. 22, 1882.

REPLIES FROM A. MIDDLEDITCH, M. D., OF WATERLOO, BLACK HAWK COUNTY.

1. City; about 6,000.
2. Do not know.
4. Judging from my own practice the amount of sickness was rather greater than the previous year.
5. About the same.
6. None.
8. None.
10. None.
14. Mortality was not very high at any date in 1881.
17. Deaths from small-pox, cholera, scarlet fever, typhoid fever, measles, whooping cough, cerebro-spinal meningitis, diphtheria, reported in Black Hawk county during 1881.

*The figures beginning each paragraph, refer to questions in Circular 23B, on page 152.

ANSWER TO NUMBER 17.

	Measles.	Scarlet fever.	Diphtheria.	Measles.	Cerebro-spinal meningitis.
January, 1881	....	4	2	1	.....
February, 1881	....	11	2	2	1
March, 1881	....	6	1	....	1
April, 1881	....	6	1	....	.....
May, 1881	1	6	1	1	2
June, 1881	....	1	3	1	.....
July, 1881	....	1	....	1	1

No deaths from either of the above diseases reported during the months of August, September, October, November or December.

18. Small-pox, cholera, whooping cough.
20. Not to my knowledge.
27. Twenty to thirty feet.
32. I think not.

Truly,

A. MIDDLEDITCH, M. D.

Waterloo, July 28, 1882.

* The figures beginning each paragraph, refer to questions in Circular 23B, on page 152.

EASTERN DIVISION.*

REPLIES OF C. H. PRESTON, M. D., OF DAVENPORT, SCOTT COUNTY.

†1. The city of Davenport; population about 22,000 (21,834 by the census of 1880).

2. Burial permits, 442, or about 20 per 1,000.

3. Within the city limits.

4. Perhaps slightly less than the average.

5. About the same.

6. Scarlet fever.

7. Lack of popular furtherance of organized efforts for prevention.

8. Malaria, measles, pertussis.

9. To natural rather than to artificial agencies. (See meteorological table.)

10. There are no available records for comparison. In the accompanying mortality table, cholera infantum, 45; consumption, 34; scarlet fever, 29; and diphtheria, 22, are the most fatal.

11. For the number of cases, the mortality has not been above the average, I believe, in any disease.

12-13. In no disease, I believe, has there been a definite decrease in mortality relative to the number of cases.

14. Scarlet fever, highest mortality, 14, reported in February; cholera infantum, highest 23, reported in July. Three-fourths of all deaths from scarlet fever and diphtheria occurred before May 1st.

15. No data.

16. Variola, January and February, two deaths.

17. Impossible; physicians' reports are not full. For mortality from each of the diseases named see the accompanying table.

18. No case of cholera. No deaths reported from measles or whooping cough.

19. See mortality table.

20. Scarlet fever to some extent.

21. Influenza or "pink eye" among horses. Most prevalent in August, September and October. One veterinary surgeon estimates his city cases in 1881 at from 200 to 300. Pneumonia, enteritis, and "colic" also prevailed among horses; no glanders or farcy; no pleuro-pneumonia or other prevalent disease among cattle.

22. See meteorological table.

23. Kept no memoranda, but judging from the precipitation the order would be, August, July, April, May, January, December, November, March, February, September, October, June.

24-25. No data for comparison.

26. I cannot say. Wells vary greatly.

27. 15 to 40 feet in the bluffs; 10 15 feet below the bluffs, about.

28. Owing to inclination of strata and varying degrees of surface erosion different wells would give widely different figures.

29-30. No data for comparison.

31. .....

32. So far as I remember, accidents from illuminating fluids, have been few; none, I believe, of importance.

* For counties comprising this division, see map, page 156.

† The figures beginning each paragraph refer to questions in Circular 23B, on page 152.

BURIAL PERMITS, DAVENPORT, 1881.	Small-Pox.	Cholera.	Scarlet Fever.	Typhoid Fever.	Measles.	Whooping Cough.	Cerebro-Spinal Meningitis.	Diphtheria.	Cholera Infantum.	Consumption.	Lung Fever.	Old Age.	Still-Birth.	Accident.	Suicide.	Not stated or indefinite.	
January	1	..	6	..	..	..	..	3	..	3	..	1	..	1	..		1
February	1	..	14	..	..	..	..	5	..	..	..	1	..	..	..		2
March	..	..	2	..	..	..	..	3	1	4	2	1	..	..	1		3
April	..	..	1	..	..	..	..	6	..	3	4	3	..	..	..		1
May	..	..	..	..	..	..	..	1	1	2	6	1	1	1	..		5
June	..	..	1	..	..	..	..	1	4	2	2	..	1	..	..		2
July	..	..	2	1	..	..	2	..	23	1	4	2	3	3	..		4
August	..	..	3	3	..	..	1	1	10	7	1	1	..	4	..		4
September	..	..	..	4	..	..	1	..	5	1	..	2	1	2	..		2
October	..	..	..	..	..	..	2	1	1	5	..	..	3	1	2		1
November	..	..	..	1	..	..	..	1	..	1	..	2	..	..	..		1
December	..	..	..	..	..	..	..	..	..	5	..	1	2	..	..		1
Total	2	..	29	9	..	..	6	22	45	34	21	15	11	12	4		27
Grand total																	236

TOTALS DURING THE YEAR.

Bronchitis, 7; capillary bronchitis, 2; broncho pneumonia, 2; croup, 6; other respiratory diseases, 8	25
Cholera morbus, 6; diarrhœa, 4; other intestinal diseases, 19	29
Brain fever, 7; meningitis, 6; apoplexy, 10; other cerebral diseases, 23.	46
Various cardiac diseases, 15; dropsy, 9	24
Typho-malarial fever, 6; typhus, 4; malarial fever, 5; general debility, 6; cancer, 8	29
Scattering, 53; tabulated (*vide supra*), 236	289
Total	442

The burial permits include a few brought from the country for burial, but probably as many dying in the city were taken elsewhere and are not herein included.

Many of the recorded diagnosis are indefinite, and others doubtless erroneous. Where two diseases, as "scarlet fever and diphtheria," are given as the cause of death, the one named first is accredited in the table.

The four cases of "typhus" are all reported by one physician.

"Scattering" diseases are those reported but seldom during the year.

METEOROLOGICAL REPORT FOR 1881, DAVENPORT, IOWA.

(Latitude, 41° 30′ N.; Longitude, 90° 30′ W.)

1881.	Actual barometer.*		Thermometer.†		Humidity.‡	Precipitation.‖
	Mean.	Range.	Mean.	Range.		
January.....	29.478	1.107	13.8° F.	61.	73.0	1.34
February...	29.431	1.012	19.9	55.	77.6	4.17
March.....	29.254	.960	28.8	38.	75.2	3.33
April.....	29.364	.613	44.6	61.	69.4	1.11
May.....	29.349	.658	69.0	50.	59.6	1.34
June.....	29.271	.470	69.7	38.	70.9	7.94
July.....	29.374	.610	77.6	37.	66.5	.91
August.....	29.354	.389	77.2	42.8	59.4	.83
September..	29.274	.650	69.7	48.	64.9	5.59
October....	29.407	1.031	56.5	42.	73.7	6.85
November..	29.409	1.139	39.7	59.	66.5	2.19
December..	29.441	.878	38.2	43.	65.0	1.71§
Ann'l mean	29.367	.793	50.4	47.9	68.47	3.11

* Corrected for temperature and instrumental elevation. Elevation above sea level, 604 feet.

† Elevation above the ground, 46.2 feet.

‡ Relative saturation, 100.

‖ Inches rain or melted snow.

§ Total precipitation, 37.28.

The most prevalent wind was the southwest; the least so, the southeast.

The most windy months were March and November; the least so, July.

Last frost in the spring, May 3; first frost in the fall, October 5.

Navigation on the Mississippi opened April 16, and closed (above), December 29. The ferry-boat made regular trips to the close of the year.

Freshet from October 10 to November 7. River highest (seventeen feet eight inches above low water), October 25, 26 and 27.

For the above data I am indebted to the kindness of Signal Service Observer R. R. Martin.

C. H. PRESTON.

Davenport, August 19, 1882.

REPLIES FROM F. H. LITTLE, M. D., MUSCATINE.

DEAR SIR—I have answered your circular with the exception of the questions on meteorological events, which will be answered by J. P. Walton, Esq., of this place, who does, and has for forty years kept an accurate record of weather changes.

*1. In a city. Ten thousand.
2. One hundred and three.
3. The city of Muscatine.
4. Considering the increase in population, I think the amount of sickness was about the same as of other years.
6. Scarlet fever.
7. The slight epidemic of scarlet fever was caused by a child going to school, after having visited friends in another city who were sick with the disease.
8. Dysentery, diarrheal diseases, etc.
9. To the protracted dry weather and the early maturity of fruit.
10. Scarlet fever.
11. Do not know of any.
12. Dysentery, diarrheal diseases, etc.
13. The small number of cases, and the unusual lightness of the attack.
14. The only high rate of mortality was caused by scarlet fever, which began in December, 1880, and continued until May 25, 1881. The mortality was about 15 per cent, owing to the malignancy of a great number of cases.
15. Malarial fevers, dysentery, diarrheal diseases.
16. Scarlet fever January 1, 1881. Small-pox January 2, 1881.
17. Small-pox, 6; cholera, none; scarlet fever, 150 reported; typhoid fever, no record; measles, 5 reported; whooping cough, no record; cerebro-spinal meningitis, 5; diphtheria, none.
18. Cholera, diphtheria.
19. Cannot do it.
20. Yes; scarlet fever.
21. In February, horses were taken with the so-called "pink-eye." So far as my observation extended, the disease was a catarrhal inflammation of the conjunctive nasal passages, larynx, and trachea and in some cases extended into the bronchial tubes. The disease was accompanied by loss of appetite, swelling of the legs, and in stallions the testes, and enlargement of the cervical and maxillary glands, which in some instances suppurated. The average duration of the disease was about ten days. It was very general, and but very few horses escaped it entirely. The mortality from it was very small, and in horses that were properly cared for, and not worked, it amounted to almost nothing.

[The replies to questions 22 to 31 are kindly furnished by J. P. Walton.]

In reply to your circular, will answer—

23. January, February, March, and April ground frozen hard, and covered deep with snow most of the time. May and June wet and warm. July and August dry and hot. September, October, November and December wet and muddy. September and October had heavy rain-falls.
24. August was unusually dry.
25. October and November were unusually wet.
26. Wells a little low in August, during the other months unusually high.
27. Our city is not level. In the valleys from 10 to 20 feet. On the hills from 20 to 40 feet.
28. Not a great difference in the seasons. During a continued dry spell wells will not supply their usual quantity.
29. The ground water was high in June and November.
30. In August for a short time the ground water was low, but not lower than it has frequently been before.

* The figures beginning each paragraph, refer to questions in Circular 23B, on page 152.

	January.	February.	March.	April.	May.	June.	July.	August.	September	October.	November.	December.	Total.
The average fall of rain and melted snow for thirty years in inches	1.52	2.21	2.78	3.79	4.95	4.59	4.68	5.69	4.29	3.65	3.27	2.34	44.27
Rain and melted snow in 1881	1.45	3.49	2.58	2.11	2.43	10.35	3.77	1.36	6.59	7.03	2.85	1.75	45.76
Average number of rainy or snowy days for thirty years	6	7	8	8	10	8½	8½	7½	8	7	8	7	77
Rainy or snowy days in 1881	9	11	9	9	11	18	7	6	13	14	9	8	124
Wet and dry months of 1881	Dry. 16 in. snow.	Dry. 15 in. snow.	Dry. 19 in. snow.	Wet. 8⅔ in. snow.	Wet.	Wet.	Dry.	Dry.	Wet.	Wet.	Wet.	Wet.	
Degrees of mean thermometer for thirty years	20.9	24.7	31.1	48.7	51.3	66.9	72.3	70.2	62.2	49.2	36.7	23.7	.....
Degrees of mean thermometer for 1881	Cold. 11.1	Cold. 20	Cold. 28	Cold. 42.7	Warm. 66.6	Warm. 69.1	Warm. 75.2	Warm. 76.7	Warm. 69.6	Warm. 54	Cold. 29.9	Warm. 35	.....

31. Can not, as I do not know of anything of such nature.

32. None.

F. H. LITTLE, M. D.

Muscatine, July 27, 1882.

REPLIES OF W. S. ROBERTSON, M. D., OF MUSCATINE.

*1. City, 10,000.
2. Don't know.
3. Incorporation.
4. Have had epidemic, scarlet fever, measles, and whooping cough.
5. Perhaps fifteen or twenty per cent for reason in No. 4.
6. Epidemic, scarlet fever and measles.
7. Imperfect quarantine and public funerals.
10–11. Answered in 6 and 7.
12 and 13. .....
14. Scarlet fever probably high in early months of 1881.
17. Small-pox probably eight or ten cases; scarlet fever, measles, and whooping cough, epidemic; number of cases unknown, extensively spread.
18. Diphtheria (true), probably none.
20. Yes.
21. Not to my knowledge.
22 to 31. Refer to J. P. Walton of this city.
31. Among Irish and Germans little precaution taken to prevent infection or contagion. Public funerals were persisted in, and all attempts of health officer and physicians were to a great degree rendered nugatory; first through ignorance of the people, and the wickedness of unprincipaled persons who diligently tried to cause the lower classes to believe health laws and quarantine were needless and oppressive. No cleansing of apartments, bedding or clothing were attempted in a large majority of instances, while death in many cases was the result of carelessness or neglect on the part of nurses and parents. The only saving clause being that it was carrying away another generation of like people with their progenitors.
32. None.

W. S. ROBERTSON, M. D.

Muscatine, July 30, 1882.

*The figures beginning each paragraph, refer to questions in Circular 23B, on page 152.

REPLIES OF H. M. DEAN, M. D., OF MUSCATINE.

*1. City, 10,000 inhabitants.
2. Probably forty deaths.
4. City mostly.
5. About the same average.
6. Scarlet fever.
7. Can assign no cause; we had a few cases in 1879, and the epidemic continued through 1881 into 1882.
8. Do not know of any.
9. .....
10. Scarlet fever and four cases of small-pox, which is unusual.
11. Can assign no cause.
12. Do not think of any.
13. .....
14. Scarlet fever lasted during the year, with quite a large mortality. Do not think of anything else.
15. Do not think of any.
16. In January, 1881, were four cases of small-pox, with two deaths. There had not been a death in this locality from small-pox for over sixteen years prior to that date.
17. Small-pox, four; cholera, none; and scarlet fever (probably), 500; typhoid fever (probably), twenty-five. In November and December were some cases of measles (probably), 100; whooping-cough, not many; cerebro-spinal meningitis, none; diphtheria, a few in connection with other diseases.
18. There was no cholera, cerebro-spinal meningitis.
19. Cannot satisfactorily answer this question.
20. Do not think attendance on the public schools in this vicinity spread any of the diseases in number 17. On the contrary, I believe those who attended school were less exposed to contagious diseases than those who were kept from school and allowed their freedom.
21. During the fall and winter months there were quite a good many cases of epizootic and pink-eye (as they were called), among horses. The epizootic ones had mostly catarrhal symptoms. Those with pink-eye had also catarrhal symptoms with weak eyes, drooping head, a very forlorn appearance, labored respiration, like the heaves, swelling of hind legs and under the abdomen, and of the scrotum in males. Many of the mares with foal dropped them (miscarried); they all got very poor and of a dejected appearance, and many of them died suddenly, even while able to do quite a fair day's work.
22–23–24, and 25. Can best be answered by J. P. Walton, of this city, who keeps a record for the Smithsonian Institute.
26. Do not know.
27. Probably about eleven feet
28. Cannot tell.
29. During the first six months the water in wells was high. Then it began to recede and was probably lower in December than at any other time.
30. Probably in July.
31. .....
32. Do not know of any.

Very truly,

H. M. DEAN, M. D.

Muscatine, July 27, 1882.

*The figures beginning each paragraph, refer to questions in Circular 24B, on page 152.

REPLIES FROM J. F. ESCHER, M. D., OF LOUDEN, CEDAR COUNTY.

*1. Incorporated town. Number of inhabitants, 575.
2. Five.
3. Village of Louden (incorporated), Cedar county, Iowa.
4. Increased by twenty per cent.
5. About an average.
6. Cholera infantum. Cannot say.
7. Prolonged and dry weather.
8. Cannot say.
9. .....
10. Same as No. 8.
11. .....
12. .....
13. .....
14. .....
15. .....
16. We had no unusual visitation.
17. Whooping cough, about twenty-five, the only disease coming under the list.
18. Small-pox, cholera, scarlet fever, typhoid fever, measles, cerebro-spinal meningitis, diphtheria.
19. I cannot do so except for a part of the year only. During January and February, pnuemonia, follicular stomatitis. March, April, May and June there were no diseases that might be called prevailing. July, August and September, cholera infantum, gastro-enteric troubles, fevers of a remittent and intermittent type. October and November, remittent and intermittent fevers. December same as March, April and May.
20. I think it has, viz., whooping cough.
21. I cannot say.
22. January, February and March quite cold; dry, with considerable snow-fall. April, cold nights and warm days, with snow on the ground nearly the entire month. May, very warm days, cool nights, and no rain. June, rainy and warm. July, first part rainy and warm; latter warm and dry, except the last week, when there were some rains. August, dry and warm. September, rain. October, warm and rainy. November and December, nothing notable.
23. September, May, August, July, April, December, November, January, February, October, and June.
24. September, May.
25. June and October.
26. Do not know.
27. From eighteen inches to sixteen feet.
28. I could only guess at it.
29. June and October.
30. September, May.
31. Only as in No. 20.
32. I believe not.

I would say that I was appointed health officer of our village only a few days since, so that during the past year some things possibly escaped my notice that would otherwise have arrested my attention.

Rspectfully,

J. F. ESCHER, M. D.

Louden, August 1, 1882.

* The figures beginning each paragraph, refer to questions in Circular 23B, on page 152.

SOUTHEASTERN DIVISION.*

REPLIES OF GEO. F. JENKINS, M. D., OF KEOKUK, LEE COUNTY.

†1. City. Population 15,000.
2. Total mortality for 1881, 160.
3. Exclusively for the city of Keokuk.
4. Rather less than usual.
5. Diminished from two to four per cent.
6. According to mortuary report, none.
7. No prevailing disease.
8. All constitutional diseases, but notably summer diarrhœas in children and the contagious exanthema.
9. Absence of humidity during the excessively hot weather and absence of the specific contagious principle necessary for the production of the eruptive fevers.
10. None, except variola during the last week of the year.
11. None, unless it be the importation of variola.
12. From all contagions, epidemic and endemic diseases, except variola.
13. Mainly to the causes mentioned in answer to question 9.
14. First cases of small-pox occurred December 23. Death rate unusually high.
15. Mortality unusually low from all diseases during the year, except the instance above given.
16. Small-pox December 23. A few mild cases of typhoid fever during the autumnal months.
17. Ten cases of small-pox (two of these died during the year, several others in 1882). Probably fifteen or twenty cases of typhoid fever—one death reported. One death reported from each of the following ing diseases, namely: measles, whooping cough, diphtheria, cerebro-spinal meningitis.
18. Cholera and scarlatina.
19. Death rate was higher during the month of April than for any other month, but this was not from the prevalence of any special disease. More deaths from consumption than any other disease—seven during the month. There is nothing in the history of the diseases occurring during the year of sufficient importance to require a monthly summary statement.
20. No.
21. Have no information on this subject.
22. Cannot answer this question.
23 to 32 inclusive. Have no information to communicate on any of these subjects. Will try and be prepared to answer them for 1882.

Respectfully,

GEORGE F. JENKINS, M. D.,
Pres. Board of Health.

Keokuk, Iowa, August 8, 1882.

* For counties in this division see map, page 156.

† The figures beginning each paragraph, refer to questions in Circular 23B, on page 152.

REPLIES OF S. C. FRANKS, M. D., OF BENTONSPORT, VAN BUREN COUNTY.

*1. Incorporated. No. of inhabitants, 390.
2. Six: Angina pectoris, 1; cerbro-spinal meningitis, 1; tubercular consumption, 1; drowning, 1; starvation followed by typhoid, 1; marasmus, 1; diphtheria, 1.
3. Bentonsport and four miles around.
4. Greater. Increase in scarlet fever, typhoid fever, and diphtheria.
5. About the same.
6. Diphtheria following measles.
7. Contagion and malarial poison.
8. Simple malarial fever. Not so prevalent.
9. Greater intensity of malarial poison, producing typho-malaria fever.
10. Diphtheria, cerebro-spinal meningitis.
11. Diphtheria following measles.
12. None.
13. ——
14. None.
15. None.
16. Typho-malarial fever.
17. Scarlet fever, 3; typhoid fever, 5; measles, 5; cerebro-spinal meningitis, 1; diphtheria, 21; typho-malarial fever, 16, accompanied with spasms in small children; varicella, 8.
18. Small-pox, whooping-cough, cholera.
19. Diphtheria in January, February, March, April, August, and October; typhoid and typho-malarial fever in July, August, and September; measles in March and April; scarlet fever in January.
20. None, excepting measles.
21. Hog and chicken cholera during summer.
22. Cannot.
23. No data.
24. July, August, and September.
25. June, October, and November.
26. Do not know.
27. Near the river, 5 feet; on the bluff, 20 to 30 feet.
28. Cannot.
29. June and October.
30. August and September.
31. No case.
32. No.

S. C. FRANKS, M. D.

Bentonsport, *August* 18, 1882.

REPLIES OF JOHN T. CROSS, M. D., FARMINGTON, VAN BUREN COUNTY.

1. Yes; incorporated. Inhabitants 800, July 1, 1881.
2. In city 10.
3. City and several miles each way.
4. Average of five years.
5. Average of five years.
6. Typhoid fever, typhoid pneumonia, consumption.
7. Temperature high, causing miasma.
8. Scarlet fever, diphtheria, cholera infantum, spinal meningitis.
9. .....
10. Typhoid pneumonia.
11. Atmospheric causes.
12. Cholera infantum, scarlet fever, typho-malarial.
13. None. Endemic atmospheric causes.
14. August, September, high.
15. February, April, May, December, January.
16. Typhoid pnuemonia in August.
17. Typhoid pneumonia, 40; typhoid fever, 6.
18. Small pox, cholera, scarlet fever, measles 8, meningitis.
19. March and April, mumps; August and September, typhoid pneumonia.
20. It has not.
21. April and May, distemper in horses generally.
22. Nothing unusual.
23. .....
24. .....
25. .....
26. Three to eight feet of water.
27. Seventeen to thirty-five feet elevation of soil.
28. Fifteen to twenty-eight feet in many.
29. April and May.
30. August and September.
31. .....
32. None.

JOHN T. CROSS, M. D.

Farmington, *August* 2, 1882.

* The figures beginning each paragraph, refer to questions in Circular 23B, on page 152.

REPLIES FROM N. G. ENO, M. D., OF KEOSAUQUA, VAN BUREN COUNTY.

*1. Yes. Number inhabitants, 1,000.
2. Fifteen.
3. Town of Keosauqua.
4. About the same as the average.
5. About the same.
6. Whooping cough.
7. None.
8. Typhoid fever.
9. Nothing in particular.
10. Dysentery and cholera infantum.
11. I cannot.
12. Typhoid fever.
13. Nothing, mortality rather large.
14. Cannot give dates.
15. Cannot give dates; rate rather high.
16. Apoplexy and Bright's disease; cannot give dates.
17. Pneumonitis, 3; phthisis, 2; whooping cough, I should say 75 at least.
18. Small pox, cholera, scarlet fever, cerebro-spinal meningitis, and diphtheria.
19. July and August, dysentery.
20. Yes; whooping cough.
21. None.
22. None specially, except very hot in July.
23. April and May very dry; June very wet; August very dry.
24. April, May and August.
25. June, July, and latter part of September.
26. I think about 30 inches.
27. In valleys fifteen to twenty feet; on high ground from twenty to forty.
28. I cannot say, intelligently.
29. June, July, and September.
30. April, May, and August.
31. Cannot do this.
32. None.

Respectfully submitted,

N. G. ENO, M. D.

REPLIES OF J. F. RICHARDSON, M. D., OF HARPER, KEOKUK COUNTY.

1. Incorporated town of Harper. Inhabitants about 310.
2. Two.
3. Town of Harper, Lafayette and Clear Creek townships.
4. About the same.
5. About the same, as I now remember.
6. Pulmonary consumption.
7. The only cause I can assign for the greater number of deaths from phthisis, was the unusual open winter, and consequent humidity of atmosphere, the last two winters.
8. Cannot say.
9, 10, and 11 are perhaps answered in 6 and 7 about as fully as I can answer intelligently.
12. Typhoid fever.
13. Typhoid having been less prevalent for three or four years past than formerly, I attribute the cause to better sanitary precautions in the way of pure water, cleanliness around dwellings, etc., which I think I can note distinctly.
14. Can mention none.
15. Can mention none.
16. I can mention none.
17. Measles, cerebro-spinal meningitis.
18. Small-pox, cholera, scarlet fever, typhoid fever.
19. Cannot at this date.
20. No.
21. Remember none.
52. Same as 19.
23. June and July, wet.

* The figures beginning each paragraph, refer to questions in Circular 23B, on page 152.

*24. August and September.
25. See 23.
26. May, June, and July about 12 feet; fall of the year, 3 feet.
27. Harper and Lafayette townships, 10 feet; Clear Creek township, 15 feet.
28. Can make no intelligent statement.
29. See 23.
30. See 24.
31. As indicated under 13, in localities where I have labored for the last ten years, I have taken especial pains to impress the people with the necessity of looking after their wells and keeping their surroundings as cleanly as possible, and to this I attribute a diminution of typhoid and malarial diseases.
32. None.

Any arrangement the State Board can adopt that will more effectually impress the masses with the importance of proper sanitation will undoubtedly conduce to the general healthfulness of our State.

J. F. RICHARDSON, M. D.

Harper, July 24, 1882.

REPLIES OF G. F. GIESE, M. D., OF DANVILLE, DES MOINES COUNTY.

1. Town not incorporated. Population about 140.
2. Four.
3. Danville, Flint River, Augusta, and Union townships.
4. About the average.
17. No small-pox, no cholera. Scarlet fever about, but none in my practice. One case of typhoid fever. Measles more plenty at one time. Whooping-cough was epidemic in the spring. Cerebro-spinal meningitis, 1. No diphtheria.
20. No.
22. The meteorological condition of this part of the State was rather peculiar last year; spring was very late with an abundance of snow; May and June were dry; July very wet; August and part of September extremely dry.
24. August and September.
25. April, July, and October.
32. None, I believe.

GEORGE F. GIESE, M. D.

Danville, August 8, 1882.

REPLIES A. A. NOYES, M. D., OF MASON CITY, CERRO GORDO COUNTY.

1. City; about 3,000 inhabitants.
2. Cannot tell in city proper.
3. Cerro Gordo county. Inhabitants increased ten per cent from last year.
4. I think about the same, except diphtheria.
5. About the average, except as to No. 4.
6. Diphtheria.
7. Probably wet and damp atmosphere.
8. No one.
9. There is no malarious influence about here.
10. Diphtheria.
11. Cannot, unless No. 7.
12. Nothing. We have natural drainage as nice as can be.
13. Pure air and water as good as in the world.
14. Diphtheria. January, February and March mostly.
15. Cannot tell, as no record, except six months of 1880.
16. Diphtheria, scarlet fever, typhoid fever, cerebro-spinal meningitis.
17. Scarlet fever, 10; typhoid complications, 15; measles, probably 200 cases or more; whooping-cough, 1; cerebro-spinal meningitis, 16.
18. Small-pox. Cholera, none.
19. It is impossible to give anything like a correct answer.
20. I think not.
21. I will refer you to latter part of this report in a statement on the diseases of stock.
22. I have kept no data of meteorological observations.
23. Have no record of rain-fall to any extent.
24. July, August and September.
25. May and June. Others medium.
26. Drilling of wells in our city and vicinity is the only way to get water, except cisterns, so it is impossible to tell.
27. In city about forty-five feet; county, sixteen feet.
28. Our city and country adjacent is underlaid with pure white lime rock in inexhaustible quantities, so that it is impossible to tell the variation.
29. March, April, May and June.
30. September, October, November and December.
31. Filthy habits, poor nourishment, ventilation bad, bad atmosphere, defective drainage, and filth generally.
32. None.

* The figures beginning each paragraph, refer to questions in Circular 23B, on page 152.

There were a few cases of pink-eye among horses, and a few cases of murrain among cattle. Pink-eye prevailed in spring and fall. Murrain in the hot season; thought to be from too high feeding. The cholera in hogs was quite prevalent in some localities. One man close to the city lost over fifty hogs, and finally some of them were examined and large quantities of worms were found. There were other pens of hogs treated in the same way for worms, and the result has been that there is no more *hog cholera*. No epidemics of any kind among cattle or horses.

There are a few things that might be remedied in our present law and rules of the Board, in my opinion: first, to make the *parents* responsible for the return to the clerk of courts of the name of child required. There is not one parent, perhaps in a thousand, that has a name ready for their child at its birth; and it would be, and is, impossible for me to travel from twenty to forty miles for the sole purpose of reporting a name, and that is the main object in the report. Furthermore, there should be some little remuneration for the work performed by the physician. I do not believe in a doctrine that makes us perform labor for nothing under penalty of law.

Our section of the state has always been blessed with general health. With our natural drainage, pure air and water, with proper attention to hygienic rules, and care to cleanliness of streets and alleys, there will be very little danger of epidemics in our city. Our sanitary condition, I am happy to report, is first-class.

Very respectfully yours,

A. A. NOYES, M. D.

Mason City, July 28, 1882.

* The figures beginning each paragraph, refer to questions in Circular 23B, on page 152.

REPLIES FROM I. W. SMITH, M. D., CHARLES CITY, FLOYD COUNTY.

I find your list of questions quite exhaustive, and some of them require reference to records, which do not now exist, such as monthly weather summaries, etc. Of course, such may, and should, be made in future. I shall make only such answer as I can make with a fair degree of certainty.

*1. City of 2,500 inhabitants.
2. 30.
3. Corporation only.
4. Rather below average, say 10 per cent.
5. About the average. There were an unusual number of deaths among the aged.
6. Diphtheria and old age.
7. Am unable to assign cause.
16. Diphtheria, August, September and December.
17. Diphtheria, 15 cases, 4 deaths; scarlet fever, 25 cases, 4 deaths; measles, 4 cases or more; typhoid fever, 4 cases; whooping cough, 20, estimated; cerebro-spinal meningitis, 1 case.
18. Small-pox, cholera.
19. Diphtheria, in August, 10 cases; September, 2 cases; December, 3 cases; scarlet fever in September, 1 case; November, 5 cases; December, 18 cases.
20. No. Local board of health has placarded and quarantined all infectious diseases.
21. "Pink-eye" among horses in December.
22. Not remarkable, except that October and November were wet and rainy.
23. Soil moisture in excess during above mentioned months, but this town has excellent natural drainage from sandy sub-soil.
25. Unusually moist in October, November and December.
27. About 20 feet; regulated chiefly by river level of water in porous sub-soil, and not subject to natural fluctuation.
32. Two men seriously burned by naptha, used to soften putty in sash factory of Andrews & Smith; was fired by match thrown from lighting a pipe.

The injured men, Geo. P. Smith, one of the proprietors, and Charles Eibert, workman, lost each three months' time, but recovered. Another man, Allison, burned his hands at the same time, and lost a month's time.

Scarlet fever was never known to have extended from one locality to another. Due we think to a close quarantine.

Diphtheria was spread in one or two instances by exposure after indisposition had set in, but before the disease was recognized. In one remarkable instance this disease appeared in August and September, and in March 1882, in a house which had been closed for two years, until one month before the first appearance mentioned.

Previous to this closure this house, an expensive brick, veneered house, costing $7,000, then newly built, had been occupied only a few months, and had two fatal cases of diphtheria. Active fumigation, etc., was used after each series of cases. Several instances occurred in which diphtheria could not be traced to any history of contagion, but until within five years, diphtheria was unknown in this town.

Local experience strengthens the theory that diphtheria often arises *de novo*, but that it is unmistakeably contagious, even in the earliest stage.

* The figures beginning each paragraph, refer to questions in Circular 23B, on page 152.

We have known a mild attack to be followed in six weeks by a rapidly fatal attack in the same individual.

Very truly,

IRVING W. SMITH.

Charles City, August 3, 1882.

REPLIES OF D. M. WICK, M. D., OF NEW HARTFORD, BUTLER COUNTY.

*1. Town not incorporated; number of inhabitants of township and town 1,000.
2. Seven.
3. Northern part of Grundy county, southern part of Butler, and eastern part of Black Hawk.
4. Much less than other years; diminished one-third.
5. About the same as previous years.
6. Consumption.
8. Diphtheria, scarlet fever, measles.
9. To the absence of any epidemic and to the wet months of September, October, November, and a mild December.
12. Diphtheria.
13. To same as enumerated in 9.
14. No disease was attended with a high rate of mortality.
15. Scarlet fever, a low rate of mortality in September and October.
17. Scarlet fever, eight cases; typhoid fever, one case; diphtheria, two cases; cerebro-spinal meningitis, one case.
18. Small-pox, cholera, measles, whooping-cough.
19. January, February, and March, pneumonia and lung diseases; April and May, malarials; June, July, August, and September, diarrheas cholera morbus, and bowel diseases October, November, and December, very little sickness of any kind.
20. No.
21. "Pink-eye" appeared largely among horses during the fall and winter months; very severe and fatal with old horses.
22. January, February, and March, were very cold months; April and May were similar to those of other years; June, July, and August, were excessively hot and dry; while September, October, November, and December, were excessively wet.
23. The dryest months were June, July, and August; and the wet months were September, October, and November.
26. The average depth of water in wells varied with the amount of rainfall.
27. About twenty feet.
29. In September, October, and November.
30. In June and July.

The subject of ventilating living and sleeping rooms and school-houses should receive more attention from medical men; and teachers and educators generally. During the cold months, we find many people living in overheated small rooms, poorly ventilated, thus causing many cases of throat and lung diseases. The sleeping rooms of these same people are small, and many times not ventilated at all. Many district school-houses have double windows, the outer one made in one sash and nailed or fastened with screws to the outside casing, thus preventing any way of admitting fresh air. Would it not be advisable for the Board of Health to publish a few small pamphlets or circulars on ventilation, and scatter among the people most needing such information.

The above I offer merely as a suggestion, having noticed the evil effects arising from the need of fresh air.

Respectfully submitted,

D. M. WICK, M. D.

New Hartford, October 11, 1882.

* The figures beginning each paragraph, refer to questions in Circular 23B, on page 152.

REPLIES OF JAMES BARR, M. D., ALGONA, KOSSUTH COUNTY.

*1. Incorporated town (1,800), eighteen hundred.
2. Have no idea.
3. Kossuth county.
4. Think about an average.
5. About average.
6. Typho malarial fever, scarlet fever, diphtheria.
7. Can assign no cause.
10. Scarlet fever, diphtheria, typhoid fever.
12. Summer complaints of children.
16. Typhoid fever (typhoid and typhoid malarial) May to August; worst September and October.
17. Small-pox, none; cholera, none; scarlatina in Algona about thirty-five); typhoid fever, thirty-four (in my own practice); measles, none; whooping-cough, none; cerebro-spinal meningitis, none; diphtheria, fourteen (in my practice.)
19. Typhoid fever, May, three; June, four; July, three; August, two; September, seven; October, twelve; November, one; December, two; total, thirty-four. Scarlatina, September, one; October, eight; November, six; December, three; total, 18. Diphtheria, January, one; November, three; December, ten; total, fourteen.
20. Yes, scarlatina.
22. January, stormy, temperature at noon, 12.19; February 1st, decade stormy, snow; March, good; June, hot, temperature 74.5; cloudy, one-half; rain-fall 3.25 inches; July, temperature 80.8 noon; clear except middle, rain-fall 5.37; August, noon 82.1, rain-fall 7.57, cloudy one-third; September, noon 68.1, rain-fall 8.28; October, temperature 55.7, cloudy three-fifths, rain-fall 3.97; November, frosts, light rains and snows; December, frosty.
23. January, February, April, March, December, May, June, July, November, October, September.
24. None.
25. September and October.
27. About sixteen feet.
29 September, October, and November.
30. No such month.
32. No case.

Respectfully,

JAMES BARR, M. D.

Algona, August 3, 1882.

REPLIES OF E. L. THORP, M. D., SHELL ROCK, BUTLER COUNTY.

I live in an incorporated town. We number about nine hundred inhabitants.

The number of deaths here were not over ten per cent from all causes.

My territory extends over several townships as well as city.

The average amount of sickness is a large per cent less than previous years. In my practice I attended more cases of dropsy and Bright's disease of the kidneys than I have for the last five years. Most of them were people in the decline of life, and most all fatal.

For the last year we have hardly had a case of continued form of fever, no diphtheria, no scarlet fever, no malignant form of disease has infested this locality. The cause, perhaps, is in consequence of so many frequent showers, cool steady weather, and an abundance of oxygen in the air.

We have not had any infectious diseases among animals for the past year, in fact we have had no malignant form of disease in this locality. What we have been called to treat have been mostly of a malarial type. Some few cases of measles and mumps is about all of that class we have had here.

* The figures beginning each paragraph, refer to questions in Circular 24B, on page 152.

We have had less dysentery and bowel complaints during the last year than we have had in many a year before. I presume it depended on the backwardness of the season. Vegetables were not in market at the time that those diseases are prevalent.

We are very fortunate here, as we are not troubled with surface water. Our wells are mostly in lime rock, and from thirty to sixty feet deep; probably will average about forty feet deep. Our country lies high, and is very rolling, which affords excellent drainage into the Shell Rock and Cedar rivers.

There is nothing more of importance to relate here.

E. L. THORP, M. D.

Shell Rock, July, 1882.

CENTRAL DIVISION.*

REPLIES OF T. NICHOLS, M. D., OF FORT DODGE, WEBSTER COUNTY.

†1. Yes. 4,500.
2. Seventy-five.
3. Webster county.
4. Fifteen per cent less than the average.
5. Ten per cent less than the average.
6. No special prevalent disease.
7. None.
8. No special disease; there was a general prevalence of health.
9. Climatic influence.
10. None.
11. None.
12. Only a general decline from all diseases.
13. Climatic influence.
14. None.
15. No special date.
16. None.
17. Scarlet fever, 25; typhoid fever, 15; measles, 20; whooping cough, 10; cerebro-spinal meningitis, 3; diphtheria, 15. Estimate.
18. Small-pox, cholera.
19. .....
20. Scarlet fever, probably.
21. No epidemic disease among animals, except "hog cholera" in mild form; not very prevalent.
22, 23, 24, 25, 26. .....
27. On prairie level and river bottom from eight to twenty feet; on second level, from twenty to forty feet.
28, 29, 30, 31. .....
[Not having kept a record, I am unable to answer questions 22-31, except 27.]
32. None that I now call to mind.

Our local board of health is inactive, doing practically nothing. Much sickness and mortality could be prevented if more attention was given to the sanitary condition of our streets and alleys, and of our water supply.

Respectfully,

T. NICHOLS, M. D.

Fort Dodge, July, 1882.

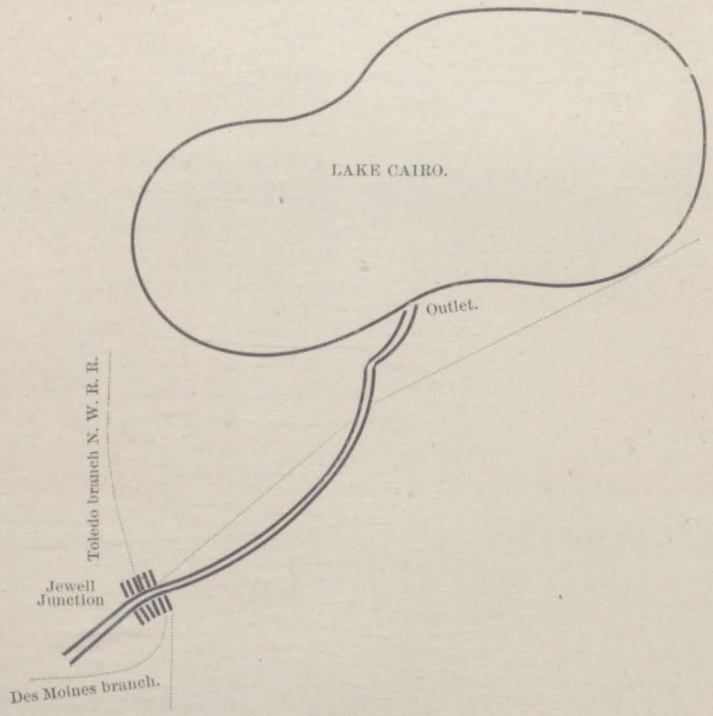
* For counties in this division see map, page 156.

† The figures beginning each paragraph, refer to questions in Circular 23B, on page 152.

REPLIES OF G. W. BLACK, M. D., OF ELLSWORTH, HAMILTON COUNTY.

*1. Live in Ellsworth, a small town in Lincoln and Scott townships, Hamilton county.
2. Twelve.
3. Scott and Lincoln, east half of Lyon, and east half of Ellsworth townships.
4. Increased mortality one-fourth.
5. Increased one-fourth.
6. Typhoid fever and malarial fevers.
7. A large amount of prairie lands broken with increased heat of summer and autumn, and surface water for drinking purposes.
8. None.
9. .....
10. Typhoid fever and malarial fever; diphtheria.
11. A highly malarious condition of the atmosphere.
12. .....
13. .....
14. Typhoid fevers in October, November, and December.
15. .....
16. Typhoid fever, 10; scarlet fever, 6; measles, 12; whooping cough, 20; diphtheria, 11.
18. Small-pox, cholera, and cerebro-spinal fever.
19. Measles, greatest in spring: whooping cough, greatest in spring: Typhoid, November and December.
20. Scarlet fever has been spread by public schools.
21. Pinkeye among horses, watering eyes and general debility.
22. .....
23. Dryest—1, July. 2, August; 3, September very wet. 4, October, November, and December wet.
24. July and August.
25. September, October, and November.
26. .....
27. Ten feet (opinion).
28. .....
29. October, November, and December.
30. It was not unusually low at any time.
31. Marsh poison is in great abundance in this vicinity. (See diagram.)

*The figures beginning each paragraph, refer to questions in Circular 23B, on page 152.



32. There was none.

G. W. BLACK, M. D.

Ellsworth, July, 1882.

REPLIES OF H. T. BALDY, OF TOLEDO, TAMA COUNTY.

*1. Incorporated town; about 1,250 inhabitants.
2. Ten.
3. Toledo and Toledo township, three by six miles.
4. Twenty-five per cent less.
5. Twenty-five per cent less.
6. Scarlet fever, measles, diphtheria.
7. Crowded and poorly ventilated sleeping apartments, and in certain localities garbage, filth, and cellars not thoroughly cleansed and disinfected.
8. Typhoid and other malarial fevers, cerebro-spinal meningitis, whooping-cough, consumption.
9. Our town is improving rapidly, old buildings are repaired, and grounds cleaned up, and thereby a better atmospheric and sanitary condition.
10. Scarlet fever. Diphtheria.
11. Less prevalence of these diseases.
12. Consumption, dysentery, and fevers.
13. Less prevalence of these diseases.
14. March and April most scarlet fever, and diphtheria rate low.
15. Spring months most illness; rate low; balance of the year very little.
16. Small-pox, none; cholera, none.
17. Scarlet fever, 3; typhoid fever, none; measles, 6; whooping-cough, 8; cerebro-spinal meningitis, none; diphtheria; 3. Opinion only.
18. Small-pox; cholera.
19. March and April, scarlet fever and diphtheria; May, measles; June, July and August, diarrhœa and cholera infantum; September and October very little fevers; November and December, quite healthy; weather pleasant and dry; no illness of any consequence.
20. No.
21. In October and November cholera prevailed among hogs with but little fatality.
22. January cold, with snow; February cold, with severe thunder and lightning; March cold, some snow; April, snow until 27th, cold and dry; May warm, with some rain; June warm and rather dry; July very warm, with great rain storms in the first part of the month, so as to inundate all the low lands, destroying all crops and producing a great deal of fever; the latter part of the month more dry. August dry, with some little rain; September, same; October, first of month dry; heavy showers of rain the latter part. November, weather fair with no particular disease. December, quite warm; not much sickness.
23. June dry, August drier, July wet, October wetter.
24. June.
25. October.
26. Our location is quite undulating, and the depth of earth above ground water varies from fifteen to eighty feet.
27. Cannot say accurately.
28. Same as 26 and 27.
29. July.
30. September.
31. Our location being undulating all refuse matter passes off quite readily through natural watercourses, and our bridges are tiled underneath, thereby causing no unhealthy condition of the atmosphere, or surroundings, by being obstructed.
32. None.

The Legislature should not charter so many medical schools, and revoke those already in existence, as doctors are turned out by the hundreds to prey upon the dear people. "Too much of a good thing is good for nothing."

H. T. BALDY, M. D.

Toledo, August 7, 1882.

* The figures beginning each paragraph, refer to questions in Circular 23B, on page 152.

REPLIES OF JOHN C. TRIBBETT, M. D., OF MONTEZUMA, POWESHIEK COUNTY.

*1. Incorporated town. Population 1,200.
2. Six.
3. Including town of Montezuma and a radius of six miles in every direction.
4. Would average with previous years.
5. About the same as average.
6. None.
7. .....
8. Zymotic diseases.
9. Protoplasmic purity.
10. Chronic diseases, none prevailing.
11. .....
12. Infectious and contagious diseases less prevalent.
13. Freedom from epidemics.
14. Most of the deaths occurred in the fall of 1881 and rate of mortality low.
15. None.
17. Small-pox, none; cholera, none; scarlet-fever, none to my recollection; typhoid fever and typhoid pneumonia, each one case; a few cases of measles, no deaths; whooping-cough, same as measles; cerebro-spinal meningitis, only one case to my knowledge, with recovery; diphtheria, none; no other epidemic, endemic, contagious or infectious diseases appeared during the year.
18. Answered in 17.
19. No distinct recollection of any monthly diseases having occurred in this locality.
20. None.
21. Epizootic in horses in February, cholera in hogs late in the spring. Pink-eye also prevalent with slight mortality among horses, during spring months.
22. Unusual rain-fall during spring and summer months, with moisture and fog during fall, with open winter in early part.
23. Almost universally moist the entire year.
24. Had no unusually dry soil in 1881.
25. March and June, July and September.
26. About fifteen feet.
27. Average twelve feet.
28. Average depth of wells twenty feet, with supply of water in proportion to drainage and precipitation. Water stands usually about twelve feet in wells, even throughout entire spring to cold weather.
29. The months as mentioned in No. 25.
30. No months in the year unusually so.
31. No basis for illustrating facts.
32. None whatever.

In my opinion, prohibition and planetary influence will prove good disinfectants for a year or so at least.

DR. JOHN C. TRIBBET.

Montezuma, October 23, 1882.

* The figures beginning each paragraph, refer to questions in Circular 23B, on page 152.

REPLIES OF B. F. BUNCH, M. D., OF LISCOMB, MARSHALL COUNTY.

*1. Incorporated town. Number of inhabitants about 500.
2. Number of deaths in the neighborhood about twenty.
3. A radius of ten miles; northern part of Marshall and southern part of Hardin, including Liscomb, Union and Bangor.
4. Considering the increase, about an average.
5. About the same.
6. Diphtheria.
7. Excessive wet weather in the early part of summer.
8. Dysentery, cholera morbus.
9. Offer no opinion.
10. From none.
11. No remarks.
12. Cholera-infantum, dysentery.
13. To a greater dryness of the atmosphere.
14. Pneumonia, February; typhoid fever, January; dysentery, August.
15. June, measles; February, typhoid fever.
16. Small-pox, scarlet fever, whooping-cough.
18. To my knowledge none appeared.
19. Cannot say.
20. None.
21. Pink-eye among horses and chicken cholera.
22 and 23. Nothing to report.
24. September.
25. June.
26. Fifteen to twenty feet.
27. Seventy-five feet.
28. About twenty feet.
29. April.
30. January.
31. No opinion at present.

No accidents by kerosene or petroleum.

I have given as correct statements as my ability will permit.

B. F. BUNCH, M. D.

Liscomb, July, 1882.

REPLIES FROM M. G. SLOAN, M. D., OF DEXTER, DALLAS COUNTY.

1. Incorporated town. 800.
2. Twelve.
3. Town of Dexter.
4. Average.
5. About the same.
6. No one disease.
7. .....
8. None.
9. .....
10. None.
11. .....
12. None.
13. .....
14. None.
15. None.
16. None.
17. We had no epidemic or contagious diseases in 1881.
18. .....
19. January, pneumonia and bronchitis; February, same; March, neuralgia, pleurisy; April, pneumonia and bronchitis; May, June, and July, very little sickness of any kind; August, intestinal troubles among children; September and October, malarial troubles; November and December, very little sickness of any kind.
20. No.
21. A few cases of hog cholera scattered throughout the year.
22. Have no means of obtaining the necessary information for answering this question.
23. Unable to state.
24. July and August.
25. No particular month.
26. Am unable to state.
27. About 12 feet.
28. Could not say.
29. Probably in the spring months.
30. August.
31. .....
32. None.

* The figures beginning each paragraph, refer to questions in Circular 23B, on page 152.

Am sorry not to be able to answer more definitely, but will endeavor hereafter to keep the necessary records, and so give more satisfactory replies to the Board's inquiries.

M. G. SLOAN, M. D.

Dexter, July, 1882.

SOUTHERN DIVISION.*

REPLIES FROM N. UDELL, M. D., OF CENTERVILLE, APPANOOSE COUNTY.

†1. City. No. of inhabitants 3,500, approximate.
2. Nineteen.
3. City of Centerville.
4. About the same as the average.
5. About the same.
6. Phthisis.
7. The severe cold of winter 1880-81, extreme heat of summer 1881.
8. Perhaps none.
9. .....
10 and 11. See 6 and 7.
12 and 13. See 8 and 9.
14. March, July, September, and November phthisis rather high.
15. Perhaps none; about average.
16. None.
17. Measles, 6; whooping-cough, 2; approximate.
18. Small-pox, cholera, scarlet fever, typhoid fever, cerebro-spinal meningitis, diphtheria. (In my opinion.)
19. August, September, and October, malarial diseases; January, February, March, pneumonia, catarrhal affections, etc.; other months nothing special; July and June, diarrhœa, cholera infantum.
20. No. The ventilation of our school-houses, and the bad condition of the privies, has caused septic trouble, sore throat, catarrhal trouble, and nervous depression.
21. Pink-eye among horses; not extensive.
22. January, February, March, cold; April and May, moist; June, July, August, September, warm and dry; November and December, wet.
23. July, August, and September, driest; January, February, March, snow; April, wet; May and June, medium; October, November, and December, wet.
24. August and September.
25. November and April.
26. April, May, June, October, November, and December, 10 feet; July, August, and September, 6 feet; January, February, March, 3 feet.
27 Eighteen to twenty-two feet.
28. April, May, June, October, November, and December, 10 to 14 feet; July, August, and September, 14 to 18 feet; January, February, and March, 16 to 20 feet.
29. No time, perhaps.
30. February and March.
31. Nothing to state.
32. None.

N. UDELL, M. D.

Centerville, July 24, 1882.

* For counties comprising this division, see map, page 156.

† The figures beginning each paragraph refer to questions in Circular 23B, on page 152.

REPLIES OF L. C. WAILES, M. D., OF PLANO, APPANOOSE COUNTY.

*1. Plano is a small village in the west part of Appanoose county; 110 on July 1, 1881.
2. Four.
3. From the west line of Appanoose county eastward eight miles; four miles south of Plano and eight miles north.
4. Greater; my opinion; forty per cent.
5. Greater; I estimate the increase at thirty per cent.
6. Gastro-enteric or typhoid fever, gastro-entero collitis, cholera infantum, and malarial fevers in their varied forms.
7. The unusual dry and excessive hot weather, especially in July, August, and September.
8. Whooping cough.
9. Whooping cough having been very prevalent in 1880, there were but few subject to it.
10. Typhoid fever, gastro-entero collitis, cholera infantum, and malarial fevers.
11. The unusual dry and hot weather.
12. Whooping cough.
13. There being fewer persons subject to whooping cough, it being prevalent in 1880.
14. Typhoid fever, flux, cholera infantum, and malarial fevers all occurred in July. The rate of mortality high.
15. No reply.
16. The diseases that occurred in this locality in 1881 were the same that usually occur. They differed only in violence and number.
17. No case of small-pox, cholera, measles, whooping cough, or cerebro meningitis occurred in this vicinity in 1881.
18. See reply to 17.
19. Cannot answer.
20. Not to my knowledge.
21. Epizootic among horses; mostly the first quarter of the year.
22. The year 1881 was the most peculiar year that I ever observed; the most violent snow storms in February and March; the snow lay in places until the 1st of May; July, August, and September were unusually dry and hot.
23. See answer to 22.
24. The same.
25. March and April.
26. The water in wells was very low in July, August, and September.
27. Average about twenty feet.
28. The water in streams and wells was very low in July, August, and September.
29. Not at all.
30. See answer to 28.
31. .....
32. No accidents from kerosene.

L. C. WAILES, M. D.

Plano, July, 1882.

* The figures beginning each paragraph, refer to questions in Circular 23B, on page 152.

NORTHWESTERN DIVISION.*

REPLIES OF PAUL L. BRICK, M. D., OF LE MARS, PLYMOUTH COUNTY.

There are many circumstances combining to increase the difficulty of obtaining satisfactory statistics of our part of the State. Plymouth county has been only lately settled, and Le Mars has been so rapidly increasing in population. Our physicians are most all new comers here. I have been here but two years and a half.

All these causes will aid in excusing my slim report.

†1. Le Mars was incorporated as a city of the second class about a year ago with a population of a little upward of 3,000; we have now nearly 5,000.
2. Could form no estimate worth mentioning.
3. Greater part of Plymouth county and south part of Sioux county. The faculty of Sioux City controls the southern part of Plymouth county mostly.
4. Greater.
5. Greater.
6. Typho-malaria, diphtheria, cholera infantum and variola.
7. I think the extreme dry weather and heat through the summer season was the cause.
8. Lung diseases.
9. To the increased prevalence of the diseases named in No. 6. It seems to have been my experience that during an epidemic all other diseases are pushed into the background.
10. Diphtheria, variola, malaria.
11. Diphtheria was present in a more violent form; variola made her first visit; malaria had never been known here before in a fatal form.
12. Rubeola.
13. Had no severe cases; weather was warm and dry, favorable to treatment.
14. Diphtheria, January to May, mortality high, mostly malignant form (pyæmia); mortality from malaria was high all through the year, I think.
15–16. Had variola in December, with one death, a child, 5 months old.
17. Small-pox, 3 cases; no cases of cholera; no scarlatina (authenticated), that I know of in 1881. Typhoid fever or typho-malaria of the typhoid type has been plenty here, but I would not attempt to set any figure as to how many cases. Had no unusual amount of measles; some cases of whooping cough with a few deaths. I treated perhaps a hundred cases of diphtheria myself, and think perhaps three fourths of all cases we had.
18. Cholera, scarlatina, cerebro-spinal meningitis.
19. .....
20. Yes.
21. The horses were taken with pink-eye in late fall, continuing until spring of 1882. Hog cholera, so-called, has prevailed considerably through the year, but has increased this spring.
22. Extremely wet during August and September.
23. .....
24. .....
25. August and September; heavy deep snow, January to April.
26. .....
27. Thirty-five to forty-five feet.
28. .....
29. September.
30. .....
31. To answer this question allow me to refer you to the diagram. (See next page.)

* For counties in this division, see map, page 156.

† The figures beginning each paragraph refer to questions in Circular 23B, on page 152.

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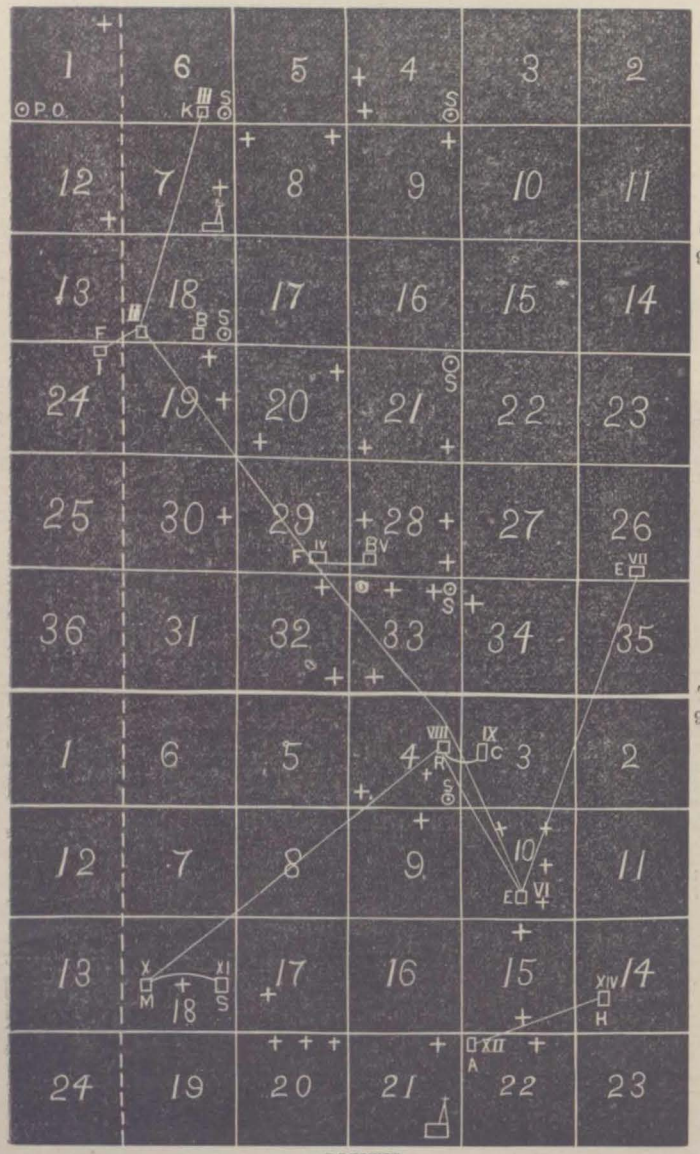


SOUTH.

The squares represent sections, the number of which is marked in the center with figures. The heavy line is the county line between Sioux on the north and Plymouth on the south. [] represents houses that have been infected with diphtheria, while the figures show the routine of the course of the disease. S denotes school houses, while the squares with a cross represent churches. A postoffice on the northwest corner is marked P. O.; the name is Corn Valley. + represents houses of customers of mine living in the close neighborhood of the line of the disease, but who escaped its ravages in their families. My first diptheria patient was in the family of C. French, section 24, 94, 47. Two cases, both croupous, both fatal. Mr. French is a son-in-law of Mr. Burket (Place I), communication kept up, the disease was carried to place II, where four cases resulted—one death among them. Mr. Kluter (place III) persisted in visiting No. 2, carried diphtheria home, had one case not fatal. Will speak of this case hereafter. Mrs. Ferris (place IV) had daily communication with No. III through Mr. C. Burket (No. V), a son of No. II and nephew of No. IV; he carried the disease to No. IV and then home (No. V.) At No. IV they had six cases, with two deaths. Mrs. Evans (No. VI) is a sister of Mrs. Ferris (No. V), and helped to nurse the patients of No. V, being very careful, however, in changing her garments before entering her own house. Mrs. Evans, though, had a slight attack of diphtheria herself, and from that communicated it to her children. They had four cases, with two deaths. From here it was taken into the family of Mr. Rolston, some three weeks after all signs of the disease had disappeared from the house of No. VI. It was transmitted by a child of No. VI sleeping at the house (No. VIII.) Here we had six cases, no deaths. About the same time Mrs. Edwards (No. VII), visiting her sister, Mrs. Evans, carried the disease home; had four cases, with two deaths. From Rolston's (No. VIII), it was carried across the road to Corbin's (No. IX), where six cases all recovered. Next, diphtheria appears at the home of Mr. Montag (No. X), he being an old-time friend of Mr. Rolston, went there frequently, taking his family along. Here we had six cases, two of which proved fatal. Lastly, from here it was through carelessness carried to N. Sherman's (No. XI) by himself, where one case of two fatal. From Mr. Albers' (XII), it was taken to J. Huron's (No. XIV), but there could no clue be traced of any connection between No. XII and any of the previous cases.

From this chain, as well as other experiences that I have had, I conclude beyond a reasonable doubt that diphtheria is a highly contagious and infectious di sease. That the infection can be carried in clothing for weeks, and that great care should be exercised on part of the physicians to prevent any spread of the disease. I had advised Mr. Kluter (No. III) to isolate at once the case in his house from the rest of the children—he has five—and give them plenty of whisky. The poor fellow was so badly scared that he kept the family half intoxicated for weeks by the influence of whisky. He had no other case in his house. At Mr. Evans' house one of the children had diphtheria two years previous. I told the family that she would not be apt

to have another attack of it. She showed symptoms of sore throat soon after the first case appeared at the house. She was put to bed with the patient, but was finally by my request permitted to leave the bed, and she was the only one in the family who did not take the disease, and the only one of the children who survived. This, as well as many other cases that I have had opportunity to watch, proves that an attack of the disease is a perfect immunity against a second attack, at least for a certain time, in fact as much so as it is the case in variola. (I have treated this year four cases of variola who had that disease years ago.)

One other point. In section 18, township 93, range 46, we have three farms on a space of half a mile. Two of these places were infected, while the one between them remained intact. Mr. Cox, the owner of the place, was a careiul man. Although he himself rendered all the aid possible at the neighbors' houses, he never allowed any of his eight children or his wife to go there. As a prophylaxis, the children were using whisky, chlorate of potash, iron, etc. I have a great deal of faith in chlorate of potash as a preventive for diphtheria. In the cure of the disease ice is one of my stand-by remedies, when there is swelling of the glands of the throat with high local pyrexia. Families accustomed to filth, if kept clean during the ravage of diphtheria, seem to escape better than those accustomed to perfect cleanliness. Disinfectants do not check the progress of infection or kill the germ, in my experience. Jaborandi is a reliable remedy in diphtheria and pseudo-membranous croup. The following is a record of one hundred cases of diphtheria treated by me:

AGES.	Under 12 m'nt hs.	1 to 5 years old.	5 to 10 years.	10 to 20 years.	Over 20 years.	TOTAL.
Deaths	..	5	8	7	2	22
Recoveries	3	5	19	35	16	78
Patients	3	10	27	42	18	100

TIME OF DEATH.	2d day.	2d to 7th day.	2d week.	3d week.	56th day.	
	1	5	10	5	1	22

32. No accidents from petroleum that I can think of in 1881.

Respectfully yours,

PAUL L. BRICK, M. D.

Le Mars, August 3, 1882.

REPLIES FROM R. D. CLARK, M. D., PORTLANDVILLE, PLYMOUTH COUNTY.

*1. Three hundred and fifty.
2. Three.
3. Within a circuit of eight miles surrounding Portlandville.
4. About the same.
5. About the same as the average.
6. None.
7. None.
8–12. .....
13. Mortality unchanged.
14. The same as No. 13.
15. There being no high or low rate of mortality.
16. Cerebro-spinal meningitis, one case, March.
17. Typhoid fever three; measles unknown, as there were quite a number in the county that got along without any assistance; cerebro-spinal meningitis, one; diphtheria, two.
18. Small-pox, cholera, and scarlet fever.
19. August and September; the others not much difference.
20. None.
21. None.
22. .....
23. Not unusual wet or dry in any month.
24–32. None.

Regretting to have to send in so incomplete a report,

Very respectfully yours,

R. D. CLARK, M. D.

Portlandville, August 3, 1882.

REPLIES OF E. HORNIBROOK, M. D., OF CHEROKEE, CHEROKEE COUNTY.

1. Incorporated town; population 2,000.
2. About twenty; only eight have been registered.
3. The whole of Cherokee county.
4. About the average.
6–7. There was no epidemic pervading the county generally during 1881. The little village of Aurelia, with about 400 inhabitants, suffered severely from typhoid fever. A slough runs through the village which seemed to be a receptacle for all the filth in the place, and the prevalence of fever was generally attributed to the noxious gases arising from this cesspool. There were several (ten in all) cases of typhoid fever in an apparently healthy locality ten miles from any town. The people were cleanly, their surroundings salubrious, the water apparently good, so that those in attendance could not determine the cause of the outbreak. It was very malignant, there being five deaths out of ten cases; the deaths in these cases resulting from hemorrhage.
8. There was less than the usual amount of diphtheria and typhoid fever.
9. Water for drinking purposes is supplied from wells. The water supply in 1881 was more abundant than in previous years, and the impurities which usually accumulate in wells were consequently more diluted. It may be that a damp atmosphere is less favorable to the growth of the diphtheria parasite than a dry atmosphere. A very severe and fatal epidemic prevailed in several parts of the county in 1880. It was most malignant after a long continued drouth. In an experience of over twenty-one years, I have always noticed the most malignant diphtheria in dry, warm weather, or in dry, cold weather, with one exception: when at the end of a very wet autumn there was a very severe epidemic of malignant diphtheria. This latter experience did not occur in this State.
10. None.
12. .....
14. The two endemic attacks of typhoid fever alluded to above—the one in the village during the latter part of the summer, August and September, and the one in the country in November and December.

* The figures beginning each paragraph, refer to questions in Circular 23B, on page 152.

*15. .....
16. .....
17. Small-pox, cholera, and scarlet fever none; typhoid fever fifty cases, approximated; measles, fifty cases, approximated; whooping cough, one hundred cases, approximated; cerebro-spinal meningitis, ten cases, approximated; diphtheria, fifty mild cases, approximated.
18. Small-pox, cholera, and scarlet fever.
19. Have no data from which to give this summary. The registrations under the regulations of the State Board of Health being utterly worthless for statistical purposes. Not more than one fifth of the deaths with their causes being registered.
20. Yes. Measles and whooping cough were notably spread in this way.
21. Hog cholera occurred during the winter and early spring months, but not to any alarming extent. There was said to be a few cases of black-foot among cattle, but in the absence of educated veterinary surgeons this is doubtful.
22. No such observations have been taken in the county.
23. I have no data except my memory to guide me. During the severe weather of January, February, March, and April the water was very low, and the soil of course dry. May, June, and July the soil was moist; August and September dry; October, November, and December moist.
24. Do not think it was unusually dry during any of the months.
25. June, July, September, October, November, and December.
26. About fifteen feet.
27. Twelve to sixteen feet.
28. Have no data except approximations which can be gathered from answers to last four questions.
29. June, July, September, and October.
30. None.
31. .....
32. None.

Beside the well known facts as to drainage, cleanliness, ventilation, water supply, etc., I would like to draw the attention of the State Board of Health to the advisability of taking some measures toward the ventilation and disinfection of railroad cars, and to the propriety of devising some means to prevent people afflicted with contagious diseases traveling in these public conveyances.

One man in this county contracted small-pox in traveling, in 1882, and died of the disease. His wife and four children took the disease and recovered. By vigorous quarantine measures the disease was kept from spreading further.

A child contracted diphtheria on the cars, and died of the disease; four other children, in the same family, and the father, contracted the disease; a man living in the same house and another child was also afflicted. All recovered except the child first taken.

Instances like these could be multiplied without number. I think it enough, however, to call attention to the fact that railway travel, as at present conducted, is one of the most prolific causes of the spread of contagious diseases.

I am, etc.,

EDW. HORNIBROOK, M. D.

Cherokee, July, 1882.

*The figures beginning each paragraph, refer to questions in Circular 23B, on page 152.

REPLIES FROM H. DE LESPINASSE, M. D., OF ORANGE CITY, SIOUX COUNTY.

*1. City not incorporated; number of inhabitants at that time probably from 300 to 400, more or less.
2. Not to be answered, by not knowing cases from other physicians.
3. Township Holland, Sioux county, Iowa.
4. Greater, by immigration of foreigners.
6. Cholera infantum; February, typho-malaria and pneumonia catarrh.
7. Cholera morbus and infantum, as well as pneumonia, affected chiefly new arrived Hollanders, non-acclimated; typhoid and malarial fever, probably caused by uncommonly openness of winter and prevalence of rain in first part of winter and autumn.
17. In my own practice as follows: Typhoid fever, 6; measles, about 30; scarlet fever, 4; diphtheria, 1; pneumonia, 7.
18. Small-pox, cholera, whooping cough, cerebro-spinal meningitis.
19. From May to latter part of September, measles, cholera infantum and cholera morbus; from August to December typhoid and malarial; from Nouember till far in following spring, an uncommon number of pneumonia.
20. Measles.
24. Latter part of July and August.
25. All fall and fore part of winter.
27. From 12 to 15 feet.

The local board of health of this township has never been in operation until the outbreak of small-pox in Orange City. No cases of the diseases in question No. 17, being reported, makes it only impossible to give anything but what I remember occurring in my own practice. Moreover, I have only been appointed to the office in June of this year, and only resided in this part of the country since May 1, 1881, which makes all comparing with previous years an impossibility.

The death rate cannot be got at, unless by classifying the returns in the clerk's office, as well of this as of previous years.

The same type of diseases occuring in township Holland, were also prevalent in townships Sherman and West Branch, for which I am also health officer.

Respectfully,

H. DE LESPINASSE, M. D.

Orange City, August 18, 1882.

*The figures beginning each paragraph, refer to questions in Circular 23B, on page 152.

REPLIES FROM H. S. BACON, M. D., OF ORANGE CITY, SIOUX COUNTY.

I send [the following answers, some of which are necessarily imperfect, from the fact that I am not in possession of any regular statistics or records, therefore only approximate answers can be given.

*1. Town of Orange City; not incorporated; number of inhabitants nearly five hundred.
2. Seven.
3. My practice is principally in Holland, Nassau and Floyd townships.
4. About the same.
5. About the same.
6. No disease was more than usually prevalent.
7. .....
8. This is a very healthy locality, and it was a season of general health.
9. Dryness of atmosphere.
15. None worthy of mention.
16. Typho-malarial fever, five; diphtheria, two; cerebro-spinal meningitis, one; whooping cough, perhaps ten.
17. No regular epidemic during the year. Although small-pox prevailed in Calliope, in the western part of our county, we remained free up here.
18. Small-pox, cholera, scarlet fever.
19. Cannot.
20. None.
21. Among horses a recurrence of the epizootic, and the so-called "cholera" among chickens, both in a light degree.
22-30. I have no statistics that will enable me to give anything like a correct answer; besides I believe that nothing special could be learned from this town, except that the weather was seasonable at all times of the year.
32. None.

Yours truly,

H. S. BACON, M. D.

August 4, 1882.

REPLIES FROM G. C. WALLACE, M. D., OF ROCK RAPIDS, LYON COUNTY.

In reply to your circular 23, I would say that I will have to give only an *opinion* in regard to the questions therein, as I was not here in 1881. I will give them as correctly as possible.

1. I live in town. Inhabitants in 1880, 600.
2. Three deaths.
3. All of Lyon county, Iowa.
4. About the same.
5. About the same.
6. None.
7. There was none.
8. There is very little sickness in this county.
9. It is a very dry atmosphere.
10. There was none.
11. None.
12. About the same.
13. About the same as former years.
14. There was none.
15. About the same.
16. There was none.
17. Diphtheria, 5 cases.
18. There was none, except a few cases purported to be typhoid fever, but I do not think there was a case of typhoid fever in the county.
19. I cannot answer.
20. There was not, to my knowledge.
21. There was none
22. I cannot answer.
23. They say it was very wet.
24. It was not dry at any time.
25. All.
26. It was high.
27. About 18 feet.

*The figures beginning each paragraph, refer to questions in Circular 23B, on page 152.

28. I cannot say.
29. All year.
30. It was not low.
31. Most sickness in this part is caused from malarial trouble, and is caused by breaking so much prairie, etc.
32. There was none in 1881.

Yours, etc.,

G. C. WALLACE, M. D.

Rock Rapids, December, 1882.

REPLIES FROM D. W. EDGAR, OF FONDA, POCAHONTAS COUNTY.

Not knowing what was required, I have not kept a record such as I shall in future. I came here April 2, 1881, so that I shall be unable to answer questions that require any answer previous to 1881.

*1. Incorporated town. No. of inhabitants, 400.
2. In my own practice, 10.
3. My practice extends over a territory of ten miles square or more.
4. .....
5. .....
6. Measles in the spring, cholera infantum in the summer months, billious and typhoid fever in the autumn months.
7. Measles here epidemic; know of no cause that would aggravate them. The excessive hot weather was the cause of the prevalence of cholera infantum in the summer, and also the cause of the malarial forms in the fall, owing to drying up of the ponds and sloughs in the country.
11. Nothing, only as stated in 7.
17. Small-pox, none; cholera, none; scarlet fever, 11 cases; typhoid fever, 8; measles, 70 or 75; whooping cough, 2; cerebro-spinal meningitis, 1; diphtheria, none.
18. Answered in 17.
19. Cannot answer satisfactorily, owing to want of facts.
20. No.
21. During the months of September, October, November, and December, horses were affected with disease known as "pink-eye." I think the disease was introduced here by horses brought here to work on the railroad, and was made more malignant by the continued rainy, cold weather.
22. During the spring months it was rainy and cold; the summer months were dry and hot; the autumn months were wet, more so than had ever been known before.
23. June, July, and August were vere very dry; September, October, and November were exceedingly wet; April and May the ground was very wet, owing to the amount of snow the winter previous.
24. .....
25. .....
26. From 8 to 12 feet.
27. From 8 to 12 feet; owing to the distance through a blue, clay subsoil, that varies in depth in various localities.
28. .....
29. April and May, September, October, and November.
30. June, July, and August.
31. In scarlet fever and typhoid fever, the cold, wet weather was undoubtedly the cause.
32. None.

The above report, meager though it is, is the best I can do under the circumstances. I am sorry that I am unable to do better, as I think it is one of the means by which the State Board of Health will be benefited, and such State laws will be enacted by their suggestion as will be of great benefit to the State.

Very truly yours,

D. W. EDGAR, M. D.

Fonda, August 27, 1882.

*The figures beginning each paragraph, refer to questions in Circular 23B, on page 152.

REPLIES FROM H. C. WEST, M. D., OF PRIMGHAR, O'BRIEN COUNTY.

*1. Neither, only a village—population 150.
2. Three.
3. Fourteen miles square, Primghar being the center.
4. Less by one-half.
5. Less by one-half.
6. None.
7. .....
8. Enteritis, diphtheria, typho-malarial fever and cholera infantum.
9. Improved sanitation, and the non existence of infections and contagium. This is a very healthy locality, not as yet even been subject to any general causes or disease, and all the infectious or contagious diseases we have ever had could be traced from other localities (being brought in by new settlers), and spreading therefrom.
10-11. .....
12. Typho-malarial fever, diphtheria, and cholera infantum.
13. Answer same as 9.
14. Cannot answer.
15. Same as 14.
16. There were none.
17. There were seven cases of measles, being in two different families. The disease was brought into one family from Minnesota, the other from Waterloo, this State. We had a few cases of whooping-cough (imported.)
18. Small-pox, cholera, scarlet fever, typhoid fever, cerebro-spinal meningitis, diphtheria, etc.
19. Have no data.
20. No.
21. We had and have yet chronic nasal glanders among horses. Was brought into the county in the spring, and a great many horses died with it in the eastern part of the county. The disease started from diseased horses brought from other localities, partly by horse dealers who are flooding this country with diseased and broken down horses from Chicago and other places. Horses affected with this disease have glandular lumps under the jaws, ulcers in the nasal cavities, and a discharge from one or both nostrils. Sooner or later they begin to fall away in flesh, become hidebound, lose their appetite, and if they are not then killed the disease assumes an acute form, and the animal dies of complete blood poisoning; if the animal should keep up in flesh that has the lumps in throat, ulcers in nose, and the discharge, farcy buds will appear on different parts of the body, the legs will swell (hind ones first, generally), become very painful, causing lameness, they lose their appetite and soon die. Another disease appeared here in the fall (called pink-eye.) A good many horses have died with the disease; it seems to be a blood disease; may settle in any part of the body, but generally in the head, no two horses being affected exactly alike. It seems to a certain extent to be contageous, but the real cause and nature of the disease is not known as yet.
22, 23-24. Cannot answer.
25. September and October.
26. Cannot answer (kept no record.)
27. About eight to ten feet in wells, and twelve to fifteen feet in streams.
28. Have no record.
29. August, September, October, and November.
30. I do not remember, but think that during no time in the year was it unusually low, but on the contrary was rather higher than usual.
31. .....
32. There were none.

Respectfully,

H. C. WEST, M. D.

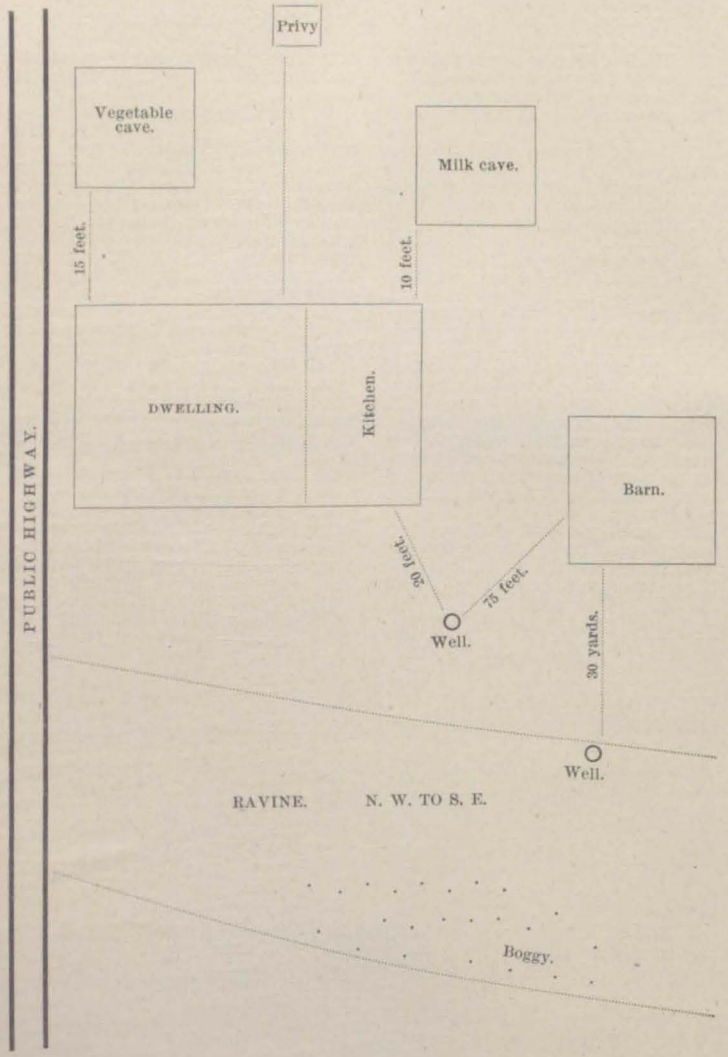
Primghar, August 28, 1882.

*The figures beginning each paragraph, refer to questions in Circular 23B, on page 152.

REPLIES OF J. C. DUNLAVY, M. D., OF HARLAN, SHELBY COUNTY.

*1. Harlan, Shelby county, Iowa; incorporated town; population, 2,360.
2. Number deaths about fifty.
3. Town of Harlan and immediate vicinity.
4. About the same as in previous years.
5. Considering increase in population about an average.
6. Cholera infantum.
7. .....
8. Miasmatic fevers.
9. Coolness of the summer and fall.
10. See No. 6; with pulmonary complications with whooping-cough.
11. .....
13. Malarial fevers, scarlatina, phthisis, pulmonalis and meningitis.
13. To mildness of type, with early and bold medical treatment.
14. August and September cholera infantum. November and December pulmonary complications in children. Rate high in former; medium in latter.
17. Small-pox and cholera, none; scarlet fever, few light cases; typhoid fever, four cases; measles, twelve or fifteen cases; whooping-cough, about fifty cases; cerebro-spinal meningitis, three cases; diphtheria, few mild cases.
18. Small-pox and cholera, none.
20. Some spreading of measles and whooping-cough.
21. Epizootic among horses in January and February; pink-eye in November and December; also a few cases of distemper, and three or four cases of glanders.
23. Driest August and September; other months more than usual amount of rain.
24. At no time was soil unusually dry, as compared with previous years.
25. The entire year.
26. Have no estimate.
27. Low lands, twenty feet; higher lands, average forty feet; exceptional cases, seventy-five to one hundred feet.
29. Cannot tell.
30. August and September.
31. Facts bearing upon causation of typhoid fever. The following is a diagram of dwelling and other buildings of family in which occurred three very bad cases of typhoid fever:

*The figures beginning each paragraph, refer to questions in Circular 23B, on page 152.



Observe the highest ground in the foregoing diagram is on the north side, consequently all filth and garbage from caves, privy, kitchen, and barn, is carried directly in course to both wells.

32. None to my knowledge.

Very respectfully yours,

J. C. DUNLAVY, M. D.

Harlan, September 2, 1882.

REPLIES OF W. R. LEWIS, M. D., OF RIPPEY, GREENE COUNTY.

*1. Unincorporated.
2. No deaths.
3. Washington township, Greene county, and Union township, Boone county. There are probably 1,700 inhabitants.
4. About average.
5. Average.
6. Scarlatina, malarial fevers.
7. Contagion of scarlet fever being brought into the territory in the manner referred to in my former report. See page 134, first report of the Secretary State Board of Health for 1880.
8. Whooping cough, measles.
9. Absence of special causes.
10. None.
11. .....
12 From all.
13. Generally mild character of diseases.
14. No disease attended by high rate.
15. August and September give the highest, the remainder of the year low.
16. Diphtheria in first half of August.
17. Small-pox, none; cholera, none; scarlet fever, ten; typhoid fever, three; cerebro-spinal meningitis, none; diphtheria, five; whooping cough, estimated, fifty cases. No epidemic or endemic diseases.
18. Small-pox, cholera, cerebro-spinal meningitis.
19. January to March, bronchitis, pneumonia; March to August, no disease prominent; August to November, diphtheria, scarlet fever, typhoid fever; November to January, no disease prominent.
20. Not to my knowledge.
21. No disease prevailed to any extent except during August and September, when there were several cases of malarial fever among horses; no cholera of hogs.
22. In the absence of weather reports I only approximate. During the winter and spring there was much snow; spring was very wet; July to October was dry; October cold and wet; also November and December.
23. January, February and March were average; April, May and June, more than usually moist; July, August and September, dryest.
24. Probably at no time was the soil unusually dry.
25. April and May.
26. Cannot say.
27. About ten feet; ranges from five to fifteen.
28. .....
29. During the wet season.
30. During the latter part of July, August and September.
31. Reported cases scarlatina in 1881.
32. None.

Respectfully,

W. R. LEWIS, M. D.

Rippey, Greene county, October 10, 1882.

*The figures beginning each paragraph, refer to questions in Circular 23B, on page 153.

REPLIES OF F. GRIFFIN, M. D., OF MAPLETON, MONONA COUNTY.

*1. Incorporated town. 500.
2. .....
3. About 8 miles either way from Mapleton.
4. About the same.
5. About the same.
6. Diphtheria, but no more than 1880.
7. Cannot.
8. Typho-malarial fever less than 1880.
9. Could not say.
10. Not any.
11. Cannot.
17. Cannot give the numbers.
18. Small-pox, cerebro-spinal menginitis, cholera.
19. Cannot do it.
20. Think not, except measles.
21. No particular disease.
22. Cannot.
32. Not any.

As you perceive, I cannot give intelligent answers to most of your questions, not having kept any record.

F. GRIFFIN, M. D.

Mapleton, August 5, 1882.

REPLIES FROM HEILMAN & MOOREHEAD, OF IDA GROVE, MONONA COUNTY.

1. Incorporated town. 1,200.
2. Twelve to fifteen.
3. This and four adjoining townships.
4. Some less than average of previous years.
5. About the same.
6. Whooping-cough, rubeola, enteric fever.
7. No cause.
8. Diphtheria and scarlet fever.
9. No cause.
10. Enteric fever.
11. Cannot.
12. None.
13. .....
14. Enteric fever, October and November high.
15. None.
16. None.
17. Scarlet fever, 3 cases; typhoid fever, 12; measles, 75; pertussis, 50; cerebro-spinal meningitis, 2.
18. Variola, cholera.
19. Cannot give it.
20. Measles and pertussis.
21. Horses had pink-eye. Hogs said to have cholera; probably pneumonitis.
22. .....
23. December, March, January, November April, February, July, October, August, May, September, June.
24. November.
25. October.
26. Don't know, had a good supply.
27. About 25 feet.
29. June.
30. August.
31. A young lady visiting eight miles from home with a family in which one member was sick with typhoid fever, and staying over night (but one night), and not subsequently exposed, contracted the disease; and in the same family, after her return and attack, two others were attacked with the same fever.
32. Two accidents from gasoline. Not serious; no persons wounded. But a number of clothes in close relation were burned, and by being discovered at once were readily put out. Gasoline used in the ordinary gasoline lamp burner.

We are sorry we can give only a meagre report and replies, but will be prepared to give a better report the next time.

Respectfully,

HEILMAN & MOOREHEAD, M. D.

Ida Grove, August 25, 1882.

*The figures beginning each paragraph refer to questions in Circular 23B, on page 152.

REPLIES FROM A. V. BENEDICT, M. D., OF DENISON, CRAWFORD COUNTY.

*1. Yes. Number of inhabitants estimated at 1,500.
2. .....
3. Five miles east, south, and west, and twelve miles north.
4. About the same.
5. About the same.
6. Know of none.
8. Diphtheria.
9. Do not know.
10. None.
11. .....
16. There were none, with the exception of one case, said to be cerebro-spinal meningitis.
17. Near as I can learn, scarlet fever two or three, typhoid fever a few cases, measles—say thirty cases, whooping cough but few cases, cerebro-spinal meningitis one case.
18. Diphtheria, cholera, and small-pox.
20. Yes; measles.
21. No diseases among animals.
24. Had no unusual dry months.
25. April, May, June, September, October, and November.
26. About eight to ten feet.
27. Greater part of the town is on high ground, which is cut by ravines; on high ground, depth to water, thirty feet or more; in the hollows and on the river bottom, five to ten feet.
29. October and November.
32. Were none.

This county seems remarkably healthy, though it appears to me that the ratio of deaths to the number of cases of sickness is greater than in other parts of the State where I am acquainted.

The fact that physicians as a rule are negligent about reporting deaths, makes it more difficult to gather facts on which to make a report.

A. V. BENEDICT, M. D.

Denison, August 30, 1881.

*The figures beginning each paragraph, refer to questions in Circular 23B, on page 152.

SOUTHWESTERN DIVISION.*

REPLIES OF ALLEN A. RAWSON, OF CORNING, ADAMS COUNTY.

†1. Incorporated town; population July, 1881, 1,625, and one mile in vicinity, about total 1,750. (Careful estimate.)
2. Thirty; see No. 5.
3. Town and one mile adjoining; see No. 1.
4. Greater; increased 35 per cent. (Opinion.)
5. Greater; during 1880, 1 to 164; during 1881, 1 to 58½ of population, taking as average 1 to 150, the increase would be about as 6 to 11, or 1 and 5-6 per cent. (Opinion.)
6. Infantile diseases, cholera infantum with complications, and pulmonary consumption.
7. High temperature, with dry air, during July and August, and hot, sultry, damp atmosphere during June.
8. Influenza, pneumonia, and pleurisy.
9. Answered by No. 13.
10. Infantile diseases 40 per cent; tuberculosis 20 per cent of deaths.
11. Prostration by heat, and hereditary.
12. Answered by No. 8.
13. Cold, dry weather, with even temperature during the year, exclusive of June, July, August, and September.
14. June, July, and August the rate was high.
15. Rate low, except in June, July, August, and September.
16. Cerebro-spinal meningitis.
17. Typhoid fever, 3 cases; measles, 75 cases; pertussis, 35 cases; cerebro-spinal meningitis, 4 cases, 1 recovered; diphtheria, 1 case, recovered (opinion).
18. Small-pox, cholera, and scarlet fever.
19. June, July, August, and first half of September, infantile diseases; the rest of the year not marked by unusual prevalence of any disease, excepting measles and pertussis in the spring and summer months.
20. No.
21. November and December. Pink-eye; disease of horses not extensive, and cases mild; the animal dull, languid, appetite fair, a pink color of eyes, no nasal disease, able to perform light work, lasting from one to four weeks.
22. *January, February, March* — Very cold, with continuous snow on the ground.
April—Cool, moderate sunshine, thawing, freezing, excessive flow of water from melting snow and ice.
May—Cool, more sunshine, moderate rain, admitting fair cultivation of soil.
June — Little rain, temperature high, sultry, air loaded with moisture from wet soil.
July, August, and first half of *September*—Dry, hot, with drouth.
September 16th—Strong wind, with fall of snow two and one half inches deep, slowly melting after two to five hours; last half of month mild, rainy, damp.
October—First half cool, changeable, moderate rain; less than average sunshine; last half cold, freezing, and thawing.
November — First half freezing, changeable; last half cloudy, moderate rain, thawing, cold.
December—Freezing, thawing, rain, cloudy, medium temperature. Roads inferior after September 16th to November 15th when they became partially and often nearly impassable until the close of the year.
23. July, August, first half of September, October, January, February, March to 20th, June, May, November, December, and April (opinion).
24. July, August, and September (opinion).
25. April, May, first half of June, last half of November, and December (opinion).
26. January, February, March, 5 feet; April, May, June, July, 15 feet; August, 6 feet; September, October, 2 feet (many wells dry); November, 5 feet; December, 7 feet (opinion).
27. Streams, 8 feet; wells near streams, fountain heads of water, or in low lands, 16 feet; wells in higher lands, 24 feet; average depth of wells about 32 feet (opinion).
28. January, February, 28 feet; March, 26 feet; April, May, June, 15 feet; July, 18 feet; August, 26 feet; September, October, 30 feet; November, 25 feet; December, 25 feet (opinion).
29. April, May, and first half of June (opinion).
30. September, October (opinion).
31. Nothing unusual; see No. 19.
32. No.

ALLEN A. RAWSON, M. D.

Corning, August 29, 1882.

*For counties in this division, see map, page 156.

†The figures beginning each paragraph, refer to questions in Circular 23B, on page 152.

REPLIES OF H. L. COKENOWER, M. D., OF CLARINDA, PAGE COUNTY.

*1. Live in incorporated town. Population, July 1, 1881, 2,600.
2. About thirty.
3. The incorporated town of Clarinda.
4. About an average, but I might say rather an increase in the death-rate.
6. Cholera infantum.
7. Oppressively warm summer.
8. Malarial diseases.
9. This is a well drained town.
17. Small-pox, five cases occurred in the town; yet there were many cases as well as many deaths from this disease outside of the corporation of which our township health physician will doubtless inform you. Typhoid fever, two; measles, about fifteen; whooping-cough, twenty; cerebro-spinal meningitis, two.
18. Scarlet fever, cholera, and diphtheria.
19. *January*—Pneumonia and rheumatism.
February—Pneumonia.
March—Pneumonia and tonsilitis.
April—Am not prepared to answer.
May and *June*—Infantile diarrhea and cholera infantum.
July and *August*—Bowel complaints were our prevailing diseases.
September—Some typho-malaria.
October—Very healthy.
November—Very healthy.
December—Pneumonia and small-pox.
20. No.
21. Cannot answer.
26. Eight feet.
27. About fifteen feet.
29. At no time during the year 1881.
30. July and August.
31. Our slaughter-houses and livery stables are in too close proximity to our residences.
32. No accident, save one, from falling from a swinging hammock.

In regard to any suggestion that I might make, I will say this much, that many of our wells are curbed instead of being walled, and I have known cases of sickness occurring doubtless from drinking the water from these wells. Also, our cellars are poorly drained, as fully shown by the recent wet weather.

The questions omitted, I cannot satisfactorily answer.

H. L. COKENOWER, M. D.

Clarinda, July 31, 1882.

*The figures beginning each paragraph, refer to questions in Circular 23B, on page 152.

REPLIES OF R. R. HANLEY, M. D., OF SIDNEY, FREMONT COUNTY.

*1. Incorporated town; 900 inhabtants.
2. Fifteen deaths.
3. Sidney township and town (population 3,000).
4. Less than the average; about 25 per cent, in my opinion.
5. See 4.
6. Not any.
7. .....
8. All the ordinary diseases, contagious and epidemic included.
9. .....
10. Not any.
11. Was none.
14, 15, 16. None.
18. Small-pox, cholera, cerebro-spinal meningitis.
19. *August*, *September*, and *October*, typho-malarial fever.
June and *July*—Cholera infantum and diarrhœa of children.
November and *December*—Diseases from colds, rheumatism, and congestion of lungs, liver and respiratory organs.
January and *February*—Diphtheria and scarlatina.
March, *April*, and *May*—Rheumatism, neuralgia, bilious fevers, and catarrhs.
The general amount of these diseases was small, and few of them of a severe character.
20. No.
21. The disease called the "pink-eye" among horses. This disease resembled very much the common horse distemper, and was marked by no great severity, except in cases of hard driving or neglect. It appeared during the months of November and December.
22. The rain-fall was light during the months of January, February, March, and April, with some severe storms of snow and ice. The winter months were very cold, and the variations of heat in April very great, the greatest being in the thermometer at noon, from 26 to 79, Fah. The rain-fall for May and June was a little over four inches each month. July and August were very dry. September and October had rain-fall to the extent of 14.75 inches. November and December were also wet months, while the weather was uniformly mild.
23. January, July, March, August, April, February, December, November, June, May, October, September.
24. July and August.
25. September and October.
26. Cannot give comparative depths of water in wells, as there are few alike in the district.
27. On uplands the wells vary from 30 to 90 feet; on the bottom lands from 15 to 35.
28. Have no data from which to answer.
29. In April nearly all the wells on the Missouri bottom were filled by water from overflow. In the uplands the water in wells are generally quite regular, while some vary with the amount of rain-fall.
30. Same as above, lowest in dry months, July and August.
31. Our most prevalent diseases are malarious, and are largely caused by the immense river bottoms of the Nishnabotna and Missouri rivers, lying to the east and south of us. Every wind, except that from the north, sweeps over several miles breadth of low bottom land, and where eddies are made by groves or bluffs for the wind, there we have more frequent cases of severe congestion, intermittent and remittent fevers. The great and sudden changes of temperature is the most common cause of rheumatism and neuralgia.

The council of this incorporated town have neglected to organize as a board of health, hence we are precluded from many advantages of the law in respect to cleanliness and other proper hygiene of tenement houses and public buildings.

* The figures beginning each paragraph, refer to questions in Circular 23B, on page 152.

It is also to be regretted that physicians are not careful to make prompt reports of births and deaths as the law requires.

Regretting that I am unable to give you accurate answers to all questions.

R. R. HANLEY, M. D.

Sidney, July, 1882.

REPLIES OF T. L. ANDREWS, M. D., OF CRESTON, UNION COUNTY.

*1. City. Population 6,500.
2. About seventy-five.
3. Two miles square, comprising the city limits.
4. I think a little greater, about twenty per cent; the increase was chiefly among children.
5. A little greater than for the two or three previous years; probably about in proportion to the increase of sickness.
6. Small-pox and cholera-infantum.
7. Cannot assign any cause for the increase.
8. Diphtheria was less prevalent than usual.
9. Cannot attribute it to any cause.
10. From small-pox and cholera-infantum.
11. Want of proper care and treatment in the small-pox cases.
12-13. .....
14. Small-pox prevailed during the months of January, February, March and April. There were twenty-three cases and twenty deaths, which may be regarded as a *very high rate of mortality*. Cholera-infantum and other infantile diseases were more than usually prevalent in July, August and September; and the rate of mortality was a little higher than usual.
15. Cannot.
16. Small-pox is the only one, and it prevailed as mentioned during the first four months of the year.
17. Twenty-three cases of small-pox. Cannot speak definitely as to the others.
18. No cholera; no cerebro-spinal meningitis.
19. Cannot.
20. To a slight extent; measles and whooping-cough.
22. Cannot.
27. From fifteen to twenty feet; but there is a considerable difference in localities quite near each other, some wells being thirty to thirty-five feet deep. Creston is situated on about the highest land in the State, but, as will be observed, the water stands quite near the surface.

This report is very imperfect, but the best I can give with the facts at command. I am collecting memoranda for the present year, and hope to make my next report more full and complete.

T. L. ANDREWS, M. D.

Creston, October 10, 1882.

* The figures beginning each paragraph, refer to questions in Circular 23B, on page 152.

REPLIES OF J. F. BEEBE, M. D., OF AFTON, UNION COUNTY.

*1. Incorporated village. Population 1,500.
2. Probably twenty, from infants to old age.
3. To the incorporated village only.
4. About the usual amount of fatal cases.
5. The fatal cases were about the usual average.
6. Diphtheria and typhoid fever.
7. Nothing to report.
8. Nothing special.
9. Nothing to report.
10. The extreme drought during July and August,
11. See No. 10, above reported.
12-13. Nothing special to report.
14. July, diphtheria, and February, pneumonia; high.
15. There have been no fatal cases of any of the other contagious diseases except measles, from which there have been three or four deaths within the radius of eight miles of Afton, over which we practice.
16. Nothing special to report.
17-18. No small-pox or cholera, but about the usual amount of all other contagious diseases.
19. Measles all spring; whooping-cough all winter and spring.
20. I believe it did in some neighborhoods.
21. Nothing special.
22. Am not prepared to give statement.
23-24. August, July, September, February, January, October, all very dry.
25. April, May and June.
26. In very dry time, one to three feet; when very wet, five to ten feet.
27. Fifteen to twenty feet on the high prairie; on or near the breaks or rough lands, very uncertain and frequently fifty feet; in the low sloughs, ten to fifteen feet, but not durable.
28. Surface water three-fourths of the year came into wells at ten feet.
29. March and April.
30. October, November and December.
31. We have nothing striking to report to this question.
32. No fatal cases and very few minor accidents.

J. T. BEEBE, M. D.

Afton, July 24, 1882.

* The figures beginning each paragraph, refer to questions in Circular 23B, on page 152.

STATUTORY REGULATIONS.

STATE BOARD OF HEALTH.

[Chapter 151, Laws of 1880.]

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

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

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

SEC. 3. The clerk of the district and circuit courts of each of the several counties in the State shall be required to keep separate books for the registration of the names and post-office address of physicians and midwives, for births, for marriages, and for deaths, which record shall show the names, date of birth, death or marriage; the names of parents and sex of the child when a birth; and when a death, shall give the age, sex and cause of death, with the date of the record and the name of the person furnishing the information. Said books shall always be open for inspection without fee; and

the clerks of said courts shall be required to render a full and complete report of all births, marriages and deaths to the secretary of the board of health annually, on the first day of October of each year, and at such other times as the board may direct. [For which service the clerk shall receive, in addition to the compensation already allowed him by law, the sum of ten cents for each birth, marriage or death so recorded by him, and the further sum of ten cents for each one hundred words of written matter contained in said report, the same to be paid out of the county fund.]—*Chapter 140, section 1, Laws 1882.*

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

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

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

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

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

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

SEC. 10. They shall elect a secretary; who shall perform the duties prescribed by the board and by this act. He shall receive a salary, which shall be fixed by the board, not exceeding $1,200 per annum. He shall with the other members of the board, receive actual traveling and other necessary expenses incurred in the performance of official duties; but no other member of the board shall receive a salary. The president of the board shall quarterly certify the amount due the secretary, and on presentation of said certificate the Auditor of State shall draw his warrant on the State Treasurer *of* [for] the amount.

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

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

SEC. 13. The mayor and alderman 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 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 dollars ($20) for every day during which he knowingly and wilfully permits such nuisance or cause of sickness to remain after the time prescribed for the removal thereof.

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

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

SEC. 20. Whenever the board of health shall think it necessary for the preservation of the lives or health of the inhabitants to enter a place, building or vessel in their township, for the purpose of examining into and destroying, removing or preventing any nuisance, source of filth or cause of sickness, and shall be refused such entry, any member of the board may make complaint, under oath, to any justice of the peace of his county, whether such justice be a member of the board or not, stating the facts of

the case, so far as he has knowledge thereof. Such justice shall thereupon issue a warrant, directed to the sheriff or any constable of the county, commanding him to take sufficient aid, and being accompanied by two or more members of said board of health, between the hours of sunrise and sunset, repair to the place where such nuisance, source of filth, or cause of sickness complained of may be, and the same destroy, remove, or prevent, under the direction of such members of the board of health.

SEC. 21. When any person coming from abroad, or residing within any city, town or township within this State, shall be infected, or shall lately have been infected with small-pox, or other sickness dangerous to the public health, the board of health of the city, town or township where said person may be, shall make effectual provision, in the manner in which they shall judge best, for the safety of the inhabitants, by removing such sick or infected person to a separate house, if it can be done without damage to his health, and by providing nurses and other assistance and supplies, which shall be charged to the person himself, his parents or other person who may be liable for his support, if able; otherwise at the expense of the county to which he belongs.

SEC. 22. If any infected person cannot be removed without damage to his health, the board of health shall make provision for him, as directed in 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 the sick.

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

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

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 the 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, or 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 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 not to exceed five hundred (500) *nor more than one thousand* dollars ($1,000), 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.

FRAUDULENT BUTTER AND CHEESE.

[Chapter 39, Laws of 1880.]

AN ACT to Protect the Dairy Interests, and for the Punishment of Fraud connected therewith.

SECTION 1. *Be it enacted by the General Assembly of the State of Iowa*, That every person who shall manufacture for sale, or who shall offer or expose for sale, any article or substance in semblance of butter not the legitimate product of the dairy, and not made exclusively of milk or cream, but into which the oil or fat of animals enters as one of the component parts, or into which a portion of melted butter, or any oil thereof, has been introduced to take the place of cream, shall distinctly, legibly, and durably brand, stamp, or mark the word "oleomargarine" upon every tub, firkin, or other package of the said substance; and that all letters used in stamping, branding, or marking said package to be not less in size than three fourths of an inch in length and one half inch in width; and in case of retail sale of such article or substance, the seller shall in all cases deliver therewith to the purchaser a written or printed lable bearing the plainly written or printed word "oleomargarine."

SEC. 2. Every person who shall knowingly sell, or offer, or expose for sale, or who shall cause or procure to be sold, any article or substance required by the first section of this act to be branded, stamped, or labeled, not so marked, branded, stamped, or labeled, shall be deemed guilty of a misdemeanor; proof of the sale, or offer, or exposure alleged shall be presumptive evidence of knowledge of the character of the article so sold or offered, and

that the same was not marked, branded, stamped, or labeled, as required by this act.

SEC. 3. Any person violating the provisions of this act shall for each and every violation be fined not less than twenty dollars, nor more than one hundred dollars, or shall be confined in the county jail not less than ten days nor more than ninety days, or both, at the discretion of the court.

Approved, March 12, 1880.

FRAUDULENT LARD.

[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, 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 conviction 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.

OFFENSES AGAINST PUBLIC HEALTH.

[Chapter 10, Title 24, Code of 1873.]

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.

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 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.

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.

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, 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 vendor, then such person shall be identified by some one known to the vendor, 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 to a fine not exceeding one hundred dollars.

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.

If any person willfully 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.

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.

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, or 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.

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.—*Section* 3877, *Code of* 1873.

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.

SECTION 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-gauge, 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.

SECTION 4064. If any person run any threshing machine in this State without having the 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 competent jurisdiction.—*Code of* 1873.

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 or 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 be paid.—*Sec.* 8, *Chap.* 50, *Laws* 1874.

DISEASED ANIMALS.

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 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. (1)—*Code of* 1873.

(1) 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 the right to kill them; 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. (2) In the case of a horse or other animal affected with glanders, which is recognized by the courts as an incura-

(2) Wood on Nuisances, Sec. 837.

(3) Hanover's Law of Horses, p. 76.

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 unwholsome or impure the water of any river, stream or pond: * * * * are nuisances." (1) —*Code of 1873.*

ble disease, (3) 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. This protection, to the individual and to the board, would, however, only be afforded in case the disease was actually the glanders, and comes under the extraordinary powers granted to the State Board, in Sec. 2, Chap. 151, Laws of 1880.

(1) Chapter 151, sections 16, 17, 18, 19, 20, Laws of 1880, provides that boards of health shall make such regulations respecting nuisances, sources of filth, and causes of sickness, as they shall judge necessary for the public health and safety. If any nuisance, source of filth, or cause of sickness found on private property be not removed within twenty-four hours after notice given by the board, the board may then order the same removed.

In order 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. An actionable 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 vs. Watts*, 2 C. & P. 486, slaughter-house; *Rankett's Case*, 2 Rolle's Abr., 140, 141, melting stinking tallow; *Catlin vs. Valentine*, 9 Paige's Ch. (N. Y.) 576, slaughter-houses; *Pickard vs. Collins*, 23 Barb., (N. Y. S. C.) 444, barn; Wood on Nuisances, Sec. 494.)

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 the public health, to abate. —*Code of 1873, Sec.* 4098.

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 indicatable nuisance, both under this section (4098) of the statute, and at the common law. (*The State vs. 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 Nuisances, page 574, section 531.)

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 such from their very nature, and which cannot exist in the vicinity

KEROSENE OIL.

[Chapter 172, Laws of 1878.]

AN ACT to Authorize Cities and Towns, and Townships, to Regulate the Sale of Coal Oil.

SECTION 1. *Be it enacted by the General Assembly of the State of Iowa:* That the mayor and council of any city, incorporated town, or the township trustees in townships wherein no city or incorporated town is situated, may, and upon the petition of any five inhabitants thereof, shall annually appoint one or more suitable persons, not interested in the sale or manufacture of coal oil, kerosene, or the product of petroleum, to be inspectors thereof in said cities,

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 or fecal matter in exposed places.

2. Those 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 any 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 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 the public health is imminent, and safety requires immediate suppression or abatement of the nuisance, the board of health, or any individual affected thereby, would be protected if they proceeded at once to suppress it, for the safety of the people is the highest law. (*Meeker vs. Rensselaer*, 14 Wend., 397). But that which is exclusively a common or public nuisance cannot lawfully be abated by the private acts of an individual. (*Harrower vs. Ritson*, 36 Barb., N. Y. S. C., 201.) Wood on Nuisances, Secs. 744, 515.

If any unhealthy nuisance is found in a public place, it would be the duty of the board of health to cause its immediate removal.

If a pond, a slaugter-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 ask the aid of the courts, to enjoin the further continuance of the nuisance, and secure its abatement. 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 courts, upon evidence. A board of health cannot decide that to be a nuisance which is not so in and of itself. 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 person, or 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. Of course 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, Chap. 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. —(*Schuster vs. Met. Board of Health*, 49 Barb. (N. Y. S. C.,) 450; Wood on Nuisances, Sec. 494, 504, 525.)

towns or townships, and fix their compensation, which shall not exceed five cents per package, to be paid by the party requiring their services, and who, before entering upon the duties of such office shall take and subscribe an oath, and also execute a bond to the State of Iowa, in such sum, and with such sureties as shall be approved by said council or township trustees, and conditioned for the faithful performance of his [their] duties; and any person aggrieved by the misconduct or neglect of such inspector, may maintain suit thereon for his own use, for all damages sustained.

SEC. 2. Upon the application of any person, purchaser, manufacturer, refiner, or producer of, or dealer in, any such oils or fluids, said inspector shall test the same, with reasonable despatch, by applying the proper test thereto, in quantities not less than one pint, as indicated and determined by some accurate instrument and approved and used for testing the quality of such illuminating oils or fluids, which instrument or apparatus the inspector shall provide at his own expense and cost. If the oils or fluids so tested will not ignite or explode at a temperature less than one hundred and fifty degrees Fahrenheit, to be ascertained as aforesaid, said inspector shall mark plainly and indelibly, over his official signature, with the date thereof, on each cask, barrel, tank, or package so tested, "Approved, fire test being 150 degrees," or more, as the same may prove; but if such oils or fluids will ignite or explode at a temperature less than one hundred and fifty degrees Fahrenheit, then the inspector shall so mark on each cask, barrel, tank or package so tested, "Condemned for illuminating purposes, fire test being —— degrees," as the same may prove less than one hundred and fifty degrees Fahrenheit. Said inspector shall keep a record of all inspections made, and enter the same within twenty-four hours thereafter in a book kept for that purpose, which shall be at all times accessible for examination by any person; and upon the termination of his office said inspector shall turn the same over to the clerk or recorder of said city, incorporated town, or township.

SEC. 3. Any inspector who shall falsely brand or mark any cask, barrel, tank, or package, or be guilty of any fraud, deceit, misconduct, or culpable negligence in the discharge of any of his official duties, or who shall either directly or indirectly, deal in any such oils or fluids while holding the office of inspector, shall be guilty of a misdemeanor, and upon conviction thereof, shall be punished by a fine not exceeding one hundred dollars, or imprisonment not exceeding thirty days, and shall be liable to the party injured for all damages occasioned thereby.

SEC. 4. Any manufacturer or refiner of, or any dealer in, any such oils or fluids, the product of petroleum, who shall sell or offer the same for sale, to any person, for illuminating purposes, without the same shall have been so inspected, or shall sell, or offer for sale any such oils or fluids, as aforesaid, which is below the test of one hundred and fifty degrees Fahrenheit, as provided in section two of this act, or who shall use any cask, barrel, tank, or package, with the inspected brand or mark thereon, the oil or fluid therein contained not having been so inspected, or who shall counterfeit any such inspector's brand or mark, shall be deemed guilty of a misdemeanor, and upon conviction thereof, shall be liable to the same penalties, provided in, and subject to, the same liabilities as set forth in section three of this act.

SEC. 3091. If any person mixes for sale naptha, and illuminating oils, or shall keep or offer for sale, or sell such mixture, or shall keep or offer for sale, or sell oil made from petroleum for illuminating purposes, or any other product of petroleum inflammable at a less temperature or fire test than one hundred and ten degrees Fahrenheit, he shall be deemed guilty of a misdemeanor, and punished for the first offense by fine not exceeding one hundred dollars, or by imprisonment in the county jail not exceeding thirty days; and for the second and every succeeding offense, by a fine not less than one hundred, and not more than one thousand dollars, or by imprisonment in the county jail not less than thirty days nor more than twelve months, or by both such fine and imprisonment.—*Code of* 1873.

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 instruction 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 vancancy occurring in said board, such vacancy shall 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 the 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 the 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.

SEC. 7. Any member of said board shall issue a temporary license to any applicant upon the presentation by such applicant of the 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 and every 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 as a special fund for meeting the expenses 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.

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 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.

PHARMACY AND THE SALE OF MEDICINES AND POISONS.

[Chapter 75, Laws of 1878, as amended by Chapter 137, Laws of 1882.]

AN ACT to Regulate the Practice of Pharmacy, and the Sale of Medicines and Poisons.

SECTION 1. *Be it enacted by the General Assembly of the State of Iowa*, 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 for medicinal use, except as hereinafter provided.

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 pharmacist. 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 the most competent pharmacists of the State, all of whom shall have been residents of the State for five years, and of at least five years practical experience in their profession, who shall be 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.

SEC. 4. The Commissioners of Pharmacy shall register in a suitable book, a duplicate of which is to be kept in the Secretary of State's office, 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 forfeit their registration when they have voluntarily sold, parted with, or severed their connection with the drug business for a period of two years at the place designated in certificate of registration; should such party who has thus forfeited his resignation wish to re-engage in the practice of pharmacy, he is required to be registered by examination as per section 5. 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 his 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 so 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 and 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 and 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 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 from 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, or 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. Apothecaries registered as herein provided shall have the right to keep and sell, under such restrictions as herein provided, all medicines and poisons authorized by the National, American, or United States Dispensatory and Pharmacopœia as of recognized medicinal utility; *Provided*, "That all provisions of Chapter six (6), Title eleven (11), of the Code of 1873, and of any laws that may be hereafter made, amendatory or in addition thereto, regulating the sale of intoxicating liquors for mechanical, culinary, medicinal, or sacramental purposes, shall be applicable to persons selling liquor under this act, or the act to which this is amendatory; *Provided, further*, That any registered pharmacist who shall be convicted of any violation of said Chapter six (6), Title eleven (11), of the Code, or of Chapter 75, of the laws of the Eighteenth General Assembly, or any law hereafter made

amendatory thereto, shall have his name stricken from the register by the Commissioners of Pharmacy."

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 vegetables 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.

SCHEDULE B.

Aconite, belladonna, colchicum, conium, nux vomica, henbane, savin, ergot, cotton root, cantharides, creosote, digitals, and their pharmaceutical preparations, croton oil, chloroform, chloral hydrate, sulphate of zinc, mineral acids, carbolic acid, oxalic acid, without distinctly labeling the box, vessel or paper in which said poison is contained, and also the outside wrapper or cover, with the name of the article, the word "poison," and 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 alcoholic liquors or compounds as a beverage, and any violations of the provisions of this section shall make the owner or principal of said store of pharmacy liable to a fine of not less than twenty-five dollars, nor 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 diseases or injury, who shall, by writing or printing, or any other method, publicly profess to cure or treat diseases, 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 twenty-five dollars. All moneys received for licenses to be paid to the Auditor of State. The sum of one thousand dollars per year, or so 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 another under this act, by making, or causing to be made, any false representation, 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 guily 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. This act shall not apply to physicians putting up their own prescriptions, nor to the sale of proprietary medicines manufactured in the State, when the same are sold and distributed by agents from an established place of business.

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.

SEC. 4046. If any person carry on, or transact any business or occupation without license therefor when such license is required by any law of this State, he shall be fined in a sum not exceeding one hundred dollars, or imprisoned in the county jail not exceeding thirty days.—*Code of 1873.*

TO PREVENT ABORTION.

[Code of 1873, Sec. 3863, as amended by Chap. 19, Laws of 19th General Assembly.]

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)

DRAINS, DITCHES AND WATER-COURSES.

SECTION 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-courses 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.]

(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.—*Decision of the Supreme Court.*

LEGISLATIVE RECOMMENDATIONS.

Another biennial period of practical experience adds still more strongly to the recommendations made in the First Biennial Report of the State Board, and to the imperative necessity for changes and amendments to chapter 151, Laws of the Eighteenth General Assembly.

The returns made to this office, from clerks of the District Courts, and the testimony of clerks, show that physicians and those who solemnize marriages, neglect to make the proper returns to the clerk of the courts. Under the provision of section five of said chapter, the clerk is authorized to make complaint for such neglect, but he must do so at his own cost. As the fines collected go into the county treasury, the county becomes the beneficiary of the recovery. The law should be so amended as to require the county or district attorney to prosecute all such cases to a final hearing in the name of the State, on complaint of the clerk, and the penalty should be a fine instead of a recovery in a civil action.

Under the provisions of the same section physicians and midwives are required to register their names with the clerk of the courts, but no penalty is provided for a neglect so to do. To secure a better compliance with the object and intent of the law, a penalty should be provided which will tend to this end.

It is evident from reports received from other States adjoining Iowa, and from various sections in Iowa, that glanders is rapidly increasing. Wisdom and safety would dictate the absolute necessity for such legislation as will protect not only the animals, but the people, from this most horrible disease. The present statutes are wholly inadequate to afford protection or relief. While it is true, local boards of health have the power to take such measures as they

deem best for the protection of the people, it is much better, where property value is concerned, to provide by special law, how, and in what manner, animals affected by this disease shall be disposed of, and how paid for

In view also of the increasing prevalence of contagious diseases of cattle throughout the country, it is recommended that a competent veterinary surgeon be added to the State Board of Health, and that the State Board of Health be empowered to take such action, upon the appearance of contagious diseases among domestic animals, as they may deem necessary.

In other States instances are on record where attempts were made to secrete the crime of abortion by false certificates as to the cause of death. Section six, of chapter 151, Laws of 1880, should be amended, by providing a severe penalty against any person who shall knowingly make any false certificate, statement, return or receipt relative to any birth, marriage, death, or still-birth, required under the provisions of this chapter, or required by the State Board of Health in the transportation of corpses.

As the statute now is, the State Board of Health has only advisory powers. Emergencies may arise where immediate and extaordinary measures will be required. The Board should be vested with executive power to act, and enforce such rules and regulations as they may deem necessary. Such power is deemed imperative in many instances where local influences defeat entirely the object and intent of the law.

DECISIONS.

The question has arisen in nearly every county of the State as to the powers and extent of jurisdiction of local boards of health in cases of epidemic contagious diseases, and as to how the expenses incurred in such cases should be paid. The question is settled by the following decision of the Supreme Court:

EXPENSES OF LOCAL BOARDS IN SMALL-POX CASES.

THE STATE OF IOWA IN SUPREME COURT: THE CITY OF CLINTON VS. THE COUNTY OF CLINTON, APPELLANT. APPEAL FROM CLINTON CIRCUIT COURT.

Action to recover for expenses alleged to have been incurred in providing for certain persons infected with small-pox, and in providing for the safety of the inhabitants. There was a trial to the court, and judgment was rendered for the plaintiff.

A. R. Cotton, for appellant.

A. R. McCoy, for appellee.

ADAMS, J.—One of the persons provided for was one Christina Shutt, who, at the time she was taken sick with small-pox, had come to Clinton a few days before with the intention of making that city her home. She was a native of Denmark, and had not gained settlement elsewhere. The statute upon which the plaintiff relies, sections 21 and 22, chapter 151, of the Laws of the Eighteenth General Assembly, McClain's Statutes, 455, provides, where relief is furnished as in this case, for charging the county to which the sick or infected persons belongs.

The defendant insists that a person belongs only to the county in which he has a settlement, and if the sick or infected person has no settlement in the State, no county can be charged.

The statute, however, above cited, 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.

We proceed next to examine certain items, which the defendant insists ought to have been rejected. One is for food and clothing furnished persons other than the sick. Under the statute above cited it becomes the duty of the local board of health to provide for the removal of the sick person, if he can be removed, and, if not, to provide for him where he may be, and also to provide for the safety of the inhabitants.

In the case at bar the sick persons were not removed, but were provided for in the houses respectively where they happened to be. No question is raised as to the proper exercise of the discretion of the board in this respect. Only two families were afflicted, and the means adopted for the safety of the inhabitants was the confinement of the members of these two families within their respective houses, with the view of securing as complete isolation as might be practicable. The prompt arrest of the contagion, and extinguishment of the disease, demonstrated the wisdom of the board.

The isolation, however, was necessarily continued through several weeks, and during at least a part of this time it was found necessary to supply the two families with food. Not all the members were sick, and yet all necessarily shared in the food.

The defendant insists that it cannot be charged, under the statute in question, for food furnished to well persons. It insists that a county can be charged with only those expenses for which the sick person is primarily liable; and it contends that neither of the sick persons in this case could be charged with food furnished to either of the well persons. But in our opinion its position cannot be sustained. The well persons, without doubt, constituted the nurses and attendants of the sick ones. If so, the food furnished constituted a part of the expenses of the sickness. But it constituted a part of the expense in another and more important sense. It was a part of the expense of isolation; and while that was adopted for the safety of the inhabitants, it was made necessary by the sickness. Section 21 of the statute provides expressly for the removal of the sick person for the safety of the inhabitants, and for charging the expenses to the sick person. The expense of isolation is of precisely the same character.

It is true that we find isolation provided for only by the general words: "Such other measures as may be deemed necessary for the safety of the inhabitants;" and we find that provision only in section 22, which contains no provision whatever for expense. The only provision for expenses is to be found in section 21. But sections 21 and 22 should be taken together. Whatever expenses are incurred under either section are, we think, to be charged alike. 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.

The board caused the clothing worn by the members of the families to be burned, and supplied other clothing. The burning of the clothing was necessary for the safety of the inhabitants. The payment therefor, or supply of other clothing, was an expense necessarily incident to the sickness. It was, we think, primarily chargeable to the sick person, and those liable for his support, and secondarily to the county.

The court allowed a recovery of $185, as money paid the attending physician, Dr. Smith. The defendant insists that in this the court erred. Its objection is based upon the ground that Dr. Smith had been employed and paid by the year, by the county, to attend to all such poor persons as he should be required to attend, under the direction of the overseer of the poor. Its objection is based upon the further ground that Dr. Smith was employed by the year by the board of health. As to the first ground, it is to be said that the services in question were not rendered under the direction of the overseer of the poor, and perhaps could not have been properly, so long as the board assumed exclusive control. As to the second, it is to be said that while Dr. Smith was employed by the board of health, at $300 per year, the court found that $185 was such proportion of $300 as the services in question bore to the year's services. Possibly it should have appeared in evidence, if it did not, that the aggregate charges, amounting to $185, were all reasonable. But the evidence is not set out, and no question is raised by the appellant upon this point.

We see no error, and the judgment is

AFFIRMED.

Filed, June, 9, 1883.

LIABILITY OF PHYSICIANS TO MAKE RETURNS TO COUNTY CLERKS.

There is an opinion prevailing among many physicians that there is no lawful reason for requiring them to make return of births and deaths to the clerk of the courts, without compensation, therefore the statute requiring such service is unconstitutional. The Supreme Court has given its opinion on the question in the following case:

THE STATE OF IOWA: IN SUPREME COURT: J. E. ROBINSON, CLERK OF THE COURTS, APPELLANT, VS. D. M. HAMILTON. APPEAL FROM MILLS DISTRICT COURT.

Action in law to recover a statute penalty. A demurrer to the petition was sustained and judgment was rendered thereon for defendants. Plaintiff appeals.

Watkins & Williams, for appellant.

No appearance for appellee.

BECK, J.—I. The petition is in ten counts and claims to recover ten dollars on each as a penalty for the failure of defendant, who is a physician, to render a report of a death or birth specified in the count, as requested by the State Board of Health, under provisions of chapter 151, Acts of the Eighteenth General Assembly, McClain's Statutes, page 451, Miller's Code, page 421.

The petition shows that defendant was required by the regulations of the State Board of Health to report in each case of death referred to, the sex, nationality, place of birth, period of residence in this State, and the place and date of burial of the decedent, and the complications connected with the cause of death, and to report in each case of birth, "the number of the child of the mother," the nationality, place of birth, and age of each parent; the maiden name of the mother, and her place of residence. It is also alleged in the petition that defendant was furnished with blanks prescribed by the State Board of Health for his reports, as required by law, and that he "knowingly and willfully failed and neglected and refused to make his report in each case for more than thirty days."

The demurrer of the petition was sustained upon the ground that the statute, so far as it authorizes the Board of Health and the plaintiff to require the defendant to report the information demanded of him, is in conflict with the Constitution of the United States, and of this State, and is unjust and oppressive, and contains requirements which were impossible for defendant to perform.

We have not been favored with the argument on behalf of the defendant, and are therefore not informed of the grounds upon which the statute in question was assailed in the court below, and is claimed to be unconstitutional. It cannot be expected that we shall consider arguments of which we have not heard, or that we will imagine objections and discuss them. Our consideration of the case will therefore be brief.

It is proper to remark that under the statute brought in question, the defendant may be required to report the information sought in the manner prescribed by the Board of Health.

II. The statute requires the collection of statistics pertaining to the population of the State, and the health of the people, which may impart information useful in the enactment of laws and valuable to science, and the medical profession; to whom the people will look for remedies for disease, and for means tending to preserve health. The objects of the statute are within the authority of the State and may be attained in the exercise of its police power. Similar objects are contemplated by States requiring a census to be periodically taken, the constitutionality of which we have never heard questioned.

III. We need not inquire whether the provisions of the statute are unjust and oppressive. These are matters for the consideration of the legislative

part of the government. We may observe that it is difficult to discover oppression or injustice in requiring the medical profession to make known to the world statistics which may promote and are promoting the public health.

IV. One ground of the demurrer is, that defendant, under the statute, is required to do that which it is impossible for him to perform. The law requires of no man impossibilities. If the information sought from defendant could not have been obtained by him in the *bona fide* exercise of reasonable diligence, the law will not punish him for not imparting it. A physician should honestly endeavor to obtain and report all information required by the regulations of the statute and the Board of Health.

This is his duty as a citizen, and is imposed as an obligation by the ethics of the useful and honorable profession of which he is a member.

In our opinion the demurrer to the plaintiff's petition was erroneously sustained. REVERSED.

Filed, December 8, 1882.

CORRESPONDENCE.

The following correspondence will fully explain itself:

Prior to the year 1882, blanks partly written and partly printed, not in the nature of personal correspondence, were admitted to the mails as third-class matter, and subject to a postal rate of one cent for every two ounces. By a ruling of the Department, it was decided that all such matter must be rated as first class and pay three cents for each half ounce. Thus, the blank forms sent from this office to to county clerks, and clerks or health officers, pass through the mails to them as third-class matter, but when returned, with the blank spaces filled with ink, weighing no more, and containing no correspondence of a personal nature, the same sheets are rated as first-class matter. Believing this ruling was unjust in its application, especially to State Boards of Health, whose sole purpose is the collection of vital statistics, beneficial to the public, and that the increased postage was a tax upon the people; and believing further, that the postal service was not designed nor intended for profit and speculation, application was made to Hon. C. C. Carpenter, member of Congress from Iowa, to ascertain whether or not a modification of the rule could be secured, so as to exempt from its operation blanks sent and received by State Boards of Health, and which contained nothing in the nature of personal correspondence.

To this, Mr. Carpenter made the following reply:

HOUSE OF REPRESENTATIVES,
WASHINGTON, D. C., May 12, 1882.

L. F. ANDREWS, ESQ., *Des Moines, Iowa:*

Dear Sir—I received from you some time since, a letter inclosing samples of the blanks which you use as Secretary of the Board of Health, and inquiring in respect to the construction put upon the law in regard to the postage upon this class of mail matter. I submitted your inquiries to the Postmas-

ter-General, with a view of finding whether any change could be made by an order of the Department, or properly made through Congress, to meet the difficulties which you encounter. I return to you his answer. It seems to be of such a character that I exceedingly doubt whether any legislation could be had in respect to it, because I think the Department would oppose it on the ground of diminishing the revenues of the Postal Department. You will see from this what he says in regard to it. If you are still of opinion that something may be done through legislation, and desire to have at least an effort made, I will at least see what action the committee will take upon a bill proposing the reforms which you suggest.

Yours truly,

C. C. CARPENTER.

POST-OFFICE DEPARTMENT,
OFFICE OF FIRST ASSISTANT POSTMASTER-GENERAL,
WASHINGTON, D. C., April 8, 1882.

HON. C. C. CARPENTER, *House of Representatives:*

Sir—I have the honor to acknowledge your reference, of yesterday, of the communication from L. F. Andrews, Assistant Secretary State Board of Health, Des Moines, Iowa.

Your reference inquires whether an amendment to the law will be necessary to accomplish the result desired by Mr. Andrews.

I am advised that such a change in the law would be necessary in order to admit sending through the mails, at less than first-class rate, printed statements with the blank spaces filled in writing, now generally required by the laws of the States to be returned to certain officers thereof. These statements are intended, in the case which you submit, to form the basis for vital statistical tables. Other applications have been made to the Department to favor the admission of statistical tables of agricultural and mineral resources of the States; others again for educational statistics, and from the bar applications to admit all court records and lawyers' briefs; from others, and including publishers, all manuscript matter for publication, and indeed the demand has been made that no matter not personal in its nature should be charged a higher rate than third-class matter.

If I understand your purpose, it is to simply reduce postage upon a certain class of documents which, so far as the State is concerned, are official in their nature, and are passing through the mails, through the territory of the particular State, authorizing the special return, only. Whether limited to this, or embracing a broader view, and it is desired to include all printed matter, having blank spaces filled in writing and not partaking of the nature of personal correspondence, I will call your attention to the late regulation, No. 232, Postal Laws and Regulations, 1879, which seemed to have been adopted to accomplish the same purpose, but which, after having been in force from July 1, 1879, was revoked by the then Postmaster-General, on the 21st day of February, 1881, as being in conflict with the law itself.

During the existence of the regulation in question, I am advised by the Third Assistant Postmaster-General, the revenues of the Department were very largely decreased as a direct consequence of reduced rate. The argument in favor of the rate was that such matter passed under the terms of the "Universal Postal Union," and therefore a merchant in San Francisco could send his business correspondence on proper blanks to his correspondent in London or Berlin at third-class rates, whereas, the same matter sent to a neighboring city must pay first-class rates.

The question of policy is one so peculiarly belonging to Congress, that beyond its effect upon the postal revenue, which will be undoubtedly to reduce it, whether extended to all matter of the class mentioned or limited to matter of public business of the State authorizing it, I do not feel it proper to discuss.

Very respectfully,

FRANK HATTON,
First Assistant Postmaster-General.

LE MARS, May 30, 1882.

HON. W. V. LUCAS, *State Auditor, Des Moines, Iowa:*

Dear Sir—During the winter of 1881 and 1882 we had a small-pox scare. It came upon us without warning, and our city council were obliged to take active measures to prevent the spread of the disease. They could not find a desirable house to condemn for that purpose, so they built a "pest house" to which patients were taken, and provided with physicians, nurses, attendants, and supplies. Nearly all of those persons so cared for were unable to pay the proportionate share of the expense.

What I desire is this, that you place this letter in the hands of the proper person connected with the State Board of Health requesting him to answer the following questions:

First. Is not the county in duty bound to pay the necessary bills thus incurred, including the expense of the pest house.

All things were done in this connection under the direction of the mayor and city council by proper committees.

Second. Should it appear that the city council, acting in the capacity of a board of health without organizing as such board, make any difference with the liability of the county when it is made to appear that they made "effectual provisions in the manner in which they shall judge best, for the safety of the inhabitants." This is the language of section 21, chapter 152, Laws Eighteenth General Assembly.

The county objects to paying the bills and expenses incurred, though they are forced to acknowledge that the prompt action of the city council confined the disease to a part of town, and had it not been done it would have been general throughout the county.

I would like as early an answer to this letter as possible, as our board of

supervisors meet in June, and we want to force the question home to them at that time.

Thanking you in advance for your trouble and kindness, I am,

Very truly yours,

A. H. LAWRENCE.

Respectfully referred to the Board of Health for answer and instructions.

W. V. LUCAS.

IOWA STATE BOARD OF HEALTH,
OFFICE OF THE SECRETARY,
DES MOINES, IOWA, June 1, 1882.

A. H. LAWRENCE, *Le Mars, Iowa:*

Dear Sir—Your communication of the 30th ult., to the State Auditor, has been referred to this office for consideration. Neither the State Board of Health nor this office has power to construe statutes. Their opinions and decisions would have no binding force on any body.

Upon the question of the expenses incurred by local boards of health, under chapter 151, Laws of 1880, in a precisely analagous case which arose in Bellevue, Jackson county, Attorney-General McPherson filed in this office the following decision:

"For expenses incurred in nursing, attendance, guarding, medical attendance, medicines, etc., in cases of small-pox, the person himself, parent, etc., are primarily liable. Next in order, the town must pay such expenses, if not made from the person, parent, etc. Or, if the town pays it, it should be collected from such person, parent, etc., if it can be done. But if it cannot be so collected, then the county, as it seems to me, is liable."

"These views are only intended to apply to towns and cities, and not townships. As to the latter, it is time enough to answer when the question arises."

Yours truly,

R. J. FARQUHARSON, M. D.,
Secretary.

OFFICE OF CLERK OF THE COURTS,
TAMA COUNTY,
TOLEDO, IOWA, June 7, 1882.

TO THE SECRETARY STATE BOARD OF HEALTH, *Des Moines, Iowa:*

Dear Sir—I am fully satisfied that some of the physicians of this county are not paying any attention to the law in regard to reporting deaths, births, etc. Now, cannot the State Board issue a circular or send me something which I can have published in the papers to stir them up a little. Of course, I have no evidence as yet that they attend any one who dies or gives birth to a child, but think perhaps I could find some one if necessary.

Very respectfully,

S. C. LELAND,
Clerk.

IOWA STATE BOARD OF HEALTH,
OFFICE OF THE SECRETARY,
DES MOINES, June 8, 1882.

S. C. LELAND, *Clerk District Court, Tama county:*

Dear Sir—It is quite apparent from returns made to this office from your county, that physicians neglect to comply with the statute in regard to making return of births and deaths. It is important, in compiling the vital statistics of the State, that the returns from each county should be complete. Unless this be so, they are practically worthless. Your attention is called to section 5, chapter 151, Laws of 1880. This section is mandatory, and, as the Attorney-General says, "was enacted to be enforced. There can be no evasion of it without incurring the liability of the penalty. It is made the duty of the Clerk of the Courts to see that the law is obeyed."

Yours truly,

R. J. FARQUHARSON, M. D.,
Secretary.

OFFICE OF CLERK OF DISTRICT AND CIRCUIT COURTS
FOR WOODBURY COUNTY,
SIOUX CITY, IOWA, June 10, 1882.

SECRETARY STATE BOARD OF HEALTH, *Des Moines, Iowa:*

Dear Sir—Upon the receipt of the two blank books, physicians' certificates of deaths and return of births and still-births, and your instructions to furnish like copies to physicians in future, I had printed copies of each by the * * * and they presented their bill to our board of supervisors, for payment at their last session. The board have refused to pay the bill, and have referred the same to me for attention. They claim that under section 4, of the act relating to the State Board of Health, it is the duty of the Secretary of the State Board of Health to *furnish* these blanks or forms. I would respectfully ask your attention and assistance.

Very respectfully,

J. H. BOLTON,
Clerk.

IOWA STATE BOARD OF HEALTH,
OFFICE OF THE SECRETARY.
DES MOINES, June 12, 1882.

J. H. BOLTON, *Clerk of the District Court, Woodbury county:*

Dear Sir—Replying to yours of the 10th, I would say that section 4, chapter 151, Laws of 1880, is construed by the State Board of Health, and by the Attorney-General, to mean that the State Board is required to furnish the forms or samples of all records and blanks contemplated by said chapter, and that the clerks of the court must furnish all persons who are required to make returns to him, with the necessary blanks, and that the county must pay for the same, as in the case of all other records and blanks necessary for his office.

The Attorney-General, in an opinion filed in this office May 10, 1880, says: "In my opinion, it is the forms of the blanks, and not the blanks, that the State Board is required to furnish. The statutes of this State provide forms for what will be a sufficient warranty deed. From this form blanks are prepared."

Yours truly,

R. J. FARQUHARSON, M. D.,
Secretary.

ILLUMINATING OIL.

Repeated admonitions, given by accidents from the use of unsafe oil the product of petroleum, renders it pertinent to repeat the suggestions made in the First Biennial Report of the State Board regarding the sale of illuminating oil. During the year 1881, the high price of kerosene, and the frequency of accidents, indicated most conclusively that low grades of oil were being sold in this State. The inevitable tendency is, when prices are high to purchase that which is cheapest. Under the name of "safety oil" and various other titles, a cheap oil is put in market, the principal part of which is gasoline. Few people know anything of its nature, but buy it because it is cheap. It is placed in common lamps and the result is as might be expected. A case of this kind occurred in Des Moines, where a man named Parker purchased a gallon of "safety oil" at a city drug store and filled an ordinary lamp with it. It was standing on a table, around which were sitting three children who were reading. The lamp exploded, and two of the children were burned so as to cause death in a few hours. The parents were badly burned in their efforts to extinguish the flames and save their children. The can containing the oil from which the lamp was filled was sent to Prof. J. K. Macomber for analysis. The following is his report thereon:

PHYSICIAL LABORATORY,
AGRICULTURAL COLLEGE,
AMES, IOWA, November 11, 1882.

DR. R. J. FARQUHARSON, *Secretary Iowa State Board of Health:*

Dear Sir—Inclosed please find a brief account of the "safety fluid."

It is a dangerous compound, and unless dealers are prosecuted to the extent of the law for selling it, many families will suffer as did Mr. Parker's. These napthas are cheap and can be sold for half the price of good kerosene, hence the temptation to sell them is great.

I shall be glad to examine any specimens sent, free of charge, if you prepay freight charges.

Very respectfully yours,

J. K. MACOMBER.

AMES, IOWA, November 11, 1882.

DR. R. J. FARQUHARSON, *Secretary Iowa State Board of Health:*

Dear Sir—The specimens of "safety fluid," referred to in your letter, came to hand, and I have examined it with considerable care. The so-called "safety fluid" is a low grade of naptha, with, perhaps, some gasoline mixed with it.

This will appear from the following table:

Name.	Specific gravity.	Fire test.
Kerosene	0.805	150°
A. Naptha	0.742	....
B. Naptha	0.724	....
C. Naptha	0.706	....
"Safety fluid"	0.695	below 32°
Gasoline	0.660	below 32°

As you see from the table its specific gravity places it between gasoline and the lowest grade of naptha.

Its fire test is at some temperature below the melting point of ice, probably below zero! If placed on ice water, and a lighted match brought near its surface for an instant it is immediately set on fire. At this time of the year I would be obliged to resort to artificial cold in order to get the lowest point at which it gives off inflammable vapor, and that is not necessary.

Good kerosene can be heated to 140° and a lighted match extinguished in it without being ignited. To call this specimen "safety fluid" would be ridiculous, were it not so serious. It gives off inflammable vapors at the ordinary temperature of the air, which are liable to ignite at any time when fire is near.

If a lamp wick were too small to fill the entire tube this "safety fluid" would creep up and, reaching the flame, would act like a fuse to conduct the fire into the lamp. Air mixed with vapor makes an explosive compound, and it is the use of naptha in kerosene which renders it dangerous.

This "safety fluid" is worse than gun powder about a house, because used so much, and used about a fire. It is especially bad to have stored about a building on account of its volatility and combustible character. If a barrel or can leaks in the slightest degree the vapor steals out, and in a closed building is ready at any time to explode with violence at the approach of a flame. With good kerosene oil there is little danger. If a lamp is broken and the oil set on fire it is extinguished easily unless allowed to get under headway. If a naptha lamp is broken and the fluid ignited, the room is immediately

filled with the highly inflammable vapor, and it is almost impossible to extinguish such a fire until all the naptha is consumed.

Very respectfully yours,

J. K. MACOMBER,
Professor of Physics.

On the 25th of September, 1882, Joseph W. Gilbert, at Grinnell, purchased a half gallon of kerosene oil with which he filled a lamp used in the family. The same evening it was lighted and left burning through the night, and at five o'clock the following morning exploded, burning all the family clothing, nearly all the household furniture, building, and other articles. Mr. Gilbert was also burned.

The oil remaining in the can from which the lamp was filled was procured and sent to Prof. Macomber, who returned the following report:

IOWA STATE COLLEGE
OF AGRICULTURE AND MECHANIC ARTS,
AMES, IOWA, Oct. 16, 1882.

STATE BOARD OF HEALTH, *Des Moines, Iowa:*

Gentlemen—The specimen of kerosene oil sent me for examination, said to be from Mr. Gilbert, of Grinnell, was duly received.

It is a good quality of kerosene oil:

Flashing point, about.....142° F.
Burning point, about.....152° F.

It is very likely that this specimen is not identical with the one said to have exploded. Lamps as generally managed usually have in them portions of many samples of oils. When a new can of oil is purchased the lamp may be half full of bad oil from a lot previously purchased which has been used for a time without dangerous consequences.

The oil from the last can may be a good one, but it is poured into the lamp and mixed with a previous lot which spoils the whole.

It would be well to find out whether this oil sent was from an oil can or a lamp.

When a man sends a sample of oil from the can, we simply get the last oil purchased, of course, and not what was in the lamp. Again, it sometimes happens a little bad oil is left in a can when filled and this may contaminate a can full of good oil.

Yours very respectfully,

J. K. MACOMBER.

It should be stated that Prof. Macomber was not informed as to the facts of the explosion. His explanation, therefore, has more

weight. The consumption of oil in the lamp had reached the point of unsafe oil of another quality remaining in the lamp when last filled.

During the year 1882 the price of kerosene has ruled very low, and as a result there was no demand or necessity for a low grade oil. Accidents from kerosene have been correspondingly less. Still it is quite evident the mercenary motives which actuate mankind in general, will give to the people only what is compelled by law. While it is true the statutes of Iowa require the standard of kerosene oil shall be not less than 150° fire-test, the provisions for securing this protection are practically null and void, in that it compels the dealer to provide the means to convict himself of violation of the law. All sanitary inspection must be compulsory and not voluntary, to accomplish good results. The inspection law should be so changed to secure compulsory inspection of all illuminating oil offered for sale in any city, town or township in this State.

With inspection a dead letter, the grade of oil is easily lowered, while the brand is unchanged. That this is possible, and highly probable, is evidenced by an examination of several samples of oil made in the office of the State Board of Health in January, 1882. These samples were procured from several retail dealers in the city of Des Moines. Each barrel from which they were taken was branded 150° fire-test.

No. 1.	Flashing point	106½° F.
	Burning point	120° F.
No. 2.	(Elaine) flashing point	106° F.
	Burning point	120° F.
No. 3.	Flashing point	106° F.
	Burning point	118° F.

These tests were repeated several times with no appreciable difference in results. The apparatus used was the so-called "New York Oil Tester," which has been adopted as the standard in New York and by the Iowa State Board of Health for this State. While these samples were not really dangerous, they were not of the standard grade. A sample of "Elaine" oil, taken from a barrel branded "Standard Oil Company, 150° Fire-test," was sent to Prof. Macomber in February, for examination. He returned the following:

STATE COLLEGE OF AGRICULTURE
AND MECHANIC ARTS,
AMES, IOWA, February 20, 1883.

STATE BOARD OF HEALTH, *Des Moines, Iowa:*

Gentlemen—After some delay I have to report in regard to the oil sent me, "Elaine," so-called—sent on January 24th, that I find the burning point to be about 143°. If marked 150°, it is certainly below grade, and it is unsafe to allow dealers to cut under 150°, as per the law, or there is no telling where they will stop.

Very respectfully,

J. K. MACOMBER.

The sanitary committee of the State Board of Health of New York, in 1882, tested 235 samples of kerosene oil, purchased at 189 different stores in different cities and towns. Of these but thirty-three stood the flash test of 100° standard, while 202 fell below. Twenty-two flashed at 70°; one reached 100°; two 101°; twelve 102°; five 104°; three 106°; one 107°; one 108°; one 109°; one 110°.

On the night of the 4th of October, 1882, by the accidental breakage of a lamp, the dwelling of Mrs. Gay, at Batavia, was destroyed and her daughter was burned to death. Samples of the oil were analized by the State chemist, who found that it would flash at 73° or 23° below the standard point. The dealer who sold the oil was indicted by a grand jury, tried and convicted by a jury, for violation of the law regulating the sale of kerosene. During the trial the dealer testified he bought the oil of the Phœnix Refining Company, of Buffalo. It was shown that it was the custom of the Inspector at the refinery to examine the oil in lots of 500 to 1,000 barrels and leave his stamps with the company who marked the barrels, a plan decidedly convenient, if nothing else, and which will afford an easy solution for the low grade oil which finds it way to this State.

Practical experience has demonstrated that the flashing point is the only safe and reliable test of kerosene or any product of petroleum. This point is the highest degree of temperature to which it can be raised without throwing off a vapor which will ignite or flash when contact is had with a lighted taper Low grade oil in half filled barrels, cans, and lamps, throw off, especially in summer and in warm rooms, an inflammable vapor of naptha, ready to explode at the slightest contact with flame. An oil therefore, that would flash at less than 100° would be unsafe. In nearly all living rooms the temperature reaches 70° to 75°; a very little increase of heat would be nec-

essary in the burning lamp to reach the flashing and dangerous point of the oil.

The flash test is being now adopted by nearly all other States, and it is most earnestly hoped the law will be so changed by the General Assembly of this State as to fix that as the standard; that provision be made for compulsory inspection throughout the State; and that the system of inspection and rules governing the same be placed within the control of the State Board of Health. Also that provision be made requiring every person who shall sell any gasoline, benzine, or other product of petroleum, except kerosene, shall inform the purchaser that the same is dangerous and unsafe to be used for illuminating purposes.

NOSOLOGICAL TABLE.

Prepared by the State Board of Health for the use of Physicians of Iowa, and to secure uniformity in their registration of "Causes of Death."

GENERAL CLASSIFICATION.

CLASSES.

I. Zymotic Diseases.
II. Parasitic Diseases.
III. Dietic Diseases.
IV. Constitutional Diseases.
V. Development Diseases.
VI. Local Diseases.
VII. Deaths from Violence.
VIII. Ill-defined Causes.

CLASS I.

Order.

1. Miasmatic Diseases.
2. Diarrheal Diseases.
3. Malarial Diseases.
4. Venereal Diseases.
5. Zoogenous Diseases.
6. Septic Diseases.

CLASS II.

Order.

1. Parasitic Diseases.

CLASS III.

Order.

1. Dietic Diseases.

CLASS IV.

Order.

1. Constitutional Diseases.

CLASS V.

Order.

1. Development Diseases of Childhood.
2. Development Diseases of Old Age.

CLASS VI.

Order.

1. Nervous System.
2. Organs of Special Sense.
3. Circulatory System.
4. Respiratory System.
5. Digestive System.
6. Lymphatic System.
7. Gland-like Organs.
8. Urinary System.
9. Reproductive System.
10. Locomotor System.
11. Integumentary System.

CLASS VII.

Order.

1. Accident or Negligence.
2. Homicide.
3. Suicide.
4. Execution.

CLASS VIII.

Order.

1. Undefined Causes.

SPECIAL CLASSIFICATION.

CLASS I.—MIASMATIC DISEASES.

Order 1. Miasmatic Diseases.

1. Small-pox { Vaccinated. / Unvaccinated. / No statistics.
2. Chicken pox.
3. Measles.
4. Epidemic rose rash.
5. Typhus fever.
6. Scarlet fever.
7. Relapsing fever.
8. Influenza.
9. Whooping cough.
10. Mumps.
11. Diphtheria.
12. Cerebro-spinal fever.
13. Enteric fever.
14. Simple continued fever.
15. Asiatic cholera.
16. Yellow fever.
17. Dengue.
18.
19.
20. Other miasmatic diseases.

Order 2. Diarrheal Diseases.

1. Simple cholera.
2. Diarrhea.
3. Dysentery.
4. Cholera infantum.

Order 3. Malarial Diseases.

1. Remittent fever.
2. Ague.
3. Typho-malarial fever.

Order 4. Venereal Diseases.

1. Syphilis.
2. Gonorrhea.

Order 5. Zoogenous Diseases.

1. Hydrophobia.
2. Glanders.
3. Splenic fever.
4. Cow-pox (vaccination).

Order 6. Septic Diseases.

1. Phagedæna.
2. Erysipelas.
3. Pyæmia-Scepticæmia
5. Puerperal fever.

CLASS II.—PARASITIC DISEASES.

Order 1.

1. Thrush.
2. Other vegetable parasitic diseases.
3. Hydatids.
4. Trichinosis.
5. Other animal parasitic diseases.

CLASS III.—DIETIC DISEASES.

Order 1.

1. Starvation—want of breast milk.
2. Scurvy.
3. Intemperance. { Chronic alcoholism. / Delirium tremens.

CLASS IV.—CONSTITUTIONAL DISEASES.

Order 1.

1. Rheumatic fever—rheumatic heart.
2. Rheumatism.
3. Gout.
4. Rickets.
5. Cancer—malignant disease.
6. Tubercular meningitis.
7. Phthisis.
8. Scrofula—tuberculosis.
9. Purpura—hemorrhagic diathesis.
10. Anæmia, etc.
11. Diabetes.
12. Other constitutional diseases.

CLASS V.—DEVELOPMENT DISEASES.

Order 1. Diseases of Childhood.

1. Premature birth.
2. Atelectasis.
3. Cyansis.
4. Spina—bifida.
5. Imperforate anus.
6. Cleft palate (hare lip).
7. Other congenital defects.

Order 2. Diseases of Old Age.

1. Old age.
2.
3.

CLASS VI.—LOCAL DISEASES.

Order 1. Nervous Diseases.

1. Inflammation of brain.
2. Apoplexy.
3. Softening of brain.
4. Hemiplegia.
5. Brain disease.
6. Hydrocephalus (not acute).
7. Insanity (general paralysis of insane).
8. Chorea.
9. Epilepsy.
10. Convulsions.
11. Laryngismus stridulus.
12. Tetanus—idiopathic.
13. Trismus nascentium.
14. Locomotor—ataxia.
15. Paraplegia—disease of the cord.
16.
17.
18.
19. Others, nervous system.

Order 2. Organs of Special Sense.

1. Otitis, otorrhæ—disease of ear.
2. Epistaxis—disease of nose.
3. Ophthalmia—disease of eye.

Order 3. Circulatory System.

1. Endocarditis, valvular disease.
2. Pericarditis.
3. Hypertrophy of heart.
4. Angina pectoris.
5. Syncope.
6. Aneurism.
7. Senile gangrene.
8. Embolism, thrombosis.
9. Phlebitis.
10. Varicose veins.
11.
12.
13. Others, circulatory system.

Order 4. Respiratory System.

1. Laryngitis.
2. Croup.
3. Others, larynx, trachea.
4. Emphysema, asthma.
5. Bronchitis.
6. Pneumonia.
7. Pleurisy.
8.
9.
10. Others, respiratory system.

Order 5. Digestive System.

1. Stomatitis.
2. Dentition.
3. Sore throat, quinsy.
4. Dyspepsia.
5. Hæmatemesis.
6. Melæna.
7. Gastritis.
8. Enteritis.
9. Ulceration of intestines.
10. Ileus, obstruction of intestines.
11. Stricture and strangulation of intestines.
12. Intussusception of intestines.
13. Hernia.
14. Fistula.
15. Peritonitis.
16. Ascites.
17. Gallstones.
18. Cirrhosis of liver.
19. Hepatitis.
20. Jaundice.
21.
22.
23. Others, liver disease.
24.
25.
26.
27.
28. Others, digestive.

Order 6. Lymphatic System.

1. Disease of spleen.
2. Disease of lymphatics.

Order 7. Gland-like Organs.

1. Bronchocele.
2. Addison's disease.

Order 8. Urinary System.

1. Nephritis.
2. Bright's Disease, albuminaria.
3. Uræmia.
4. Suppression of urine.
5. Calculus.
6. Hæmaturia.
7. Disease of bladder and prostate.
8.
9.
10.
11. Others, urinary system.

Order 9. Reproductive System—Organs of Generation.

1. Ovarian disease.
2. Disease of uterus and vagina.
3. Pelvic abscess.
4. Perineal abscess.
5. Diseases of penis, testes, etc.

Order 9. Reproductive System—Diseases of Parturition.

1. Abortion, miscarriage.
2. Puerperal mania.
3. Puerperal convulsions.
4. Placenta prævia, flooding.
5. Phlegmasia dolens.
6.
7. Other accidents of child-birth.

Order 10. Locomotor System.

1. Caries, necrosis.
2. Arthritis, ostitis.
3.
4. Others, locomotor system.

Order 11. Integumentary System.

1. Carbuncle.
2. Phlegmon, cellulitis.
3. Lupus.
4. Ulcer, bed-sore.
5. Eczema.
6. Pemphigus.
7. Others, integumentary system.

CLASS VII.—ACCIDENT OR NEGLIGENCE.

Order 1.

1. Fracture, contusion.
2. Gunshot wounds.
3. Cut, stab.
4. Burn, scald.
5. Poison.
6. Drowning.
7. Suffocation, strangulation.
8. Coal-mine.
9. Railroad.
10. Lightning.
11. Cold.
12. Heat, sunstroke.
13. Otherwise.

Order 2. Homicide.

1. Murder, manslaughter.

Order 3. Suicide.

1. Gunshot wounds.
2. Cut, stab.
3. Poison.
4. Drowning.
5. Hanging.
6. Otherwise.

Order 4. Execution.

1. Hanging.

CLASS VIII.—ILL-DEFINED CAUSES.

Order 1.

1. Dropsy.
2. Debility.
3. Atrophy and inanition.
4. Mortification.
5. Tumor.
6. Abcess.
7. Hemorrhage.
8. Sudden, unascertained.
9. Not specified, or ill-defined.

NOTE.—Where a person is "found drowned," and it cannot be ascertained whether the case is a suicide, a murder, or an accident, the case should be classed under "accident or negligence." (Class 7.)

METEOROLOGICAL REPORT.

It is the intention of the State Board to secure meteorological observations throughout the State, that the relations between meteorological conditions and the various diseases and causes of death known to be largely influenced by atmospheric conditions may be studied. To do this requres time. A beginning has been made, and it is expected to enlarge the work, so that the next Report of the Board will show results. Herein is given such observations and compilations as have been available. Prior to the establishment of the Iowa Weather Service, under the direction of Prof. G. Hinrichs, of the State University, very few meteorological observations were made in the State. The most complete were those made by Prof. T. S. Parvin, to whom the State is indebted for the valuable data he has put on record.

[TABLE III.] METEOROLOGICAL OBSERVATIONS.

Taken at Des Moines, by F. W. Conrad, Sergeant U. S. Signal Service Corps.

1881—JANUARY—1881.

Latitude 41° 35'. Longitude 90° 40'. Above sea level 849 feet.

DATE.	Daily mean barometer.	Daily mean temperature.	Daily mean humidity.	Prevailing direction of wind.	Daily rainfall.
January..... 1	29.988	22.7	63.0	SW	.....
January..... 2	30.341	11.5	75.6	N	.....
January..... 3	30.398	6.5	68.7	NW	.....
January..... 4	29.943	23.0	67.0	SW	.....
January..... 5	29.690	27.0	71.0	SW	.01
January..... 6	30.181	6.0	70.3	N	.19
January..... 7	30.494	3.5	70.3	W	.....
January..... 8	30.577	2.5	78.7	E	.06
January..... 9	30.416	-8.0	61.0	N	.01
January.....10	30.094	11.2	67.0	SW	.....
January.....11	30.058	16.5	66.3	S	.....
January.....12	29.572	35.5	68.7	SW	.....
January.....13	30.227	-8.2	73.2	N	.15
January.....14	30.030	5.0	63.7	SW	.....
January.....15	29.833	14.2	66.0	NE	.55
January.....16	30.348	6.0	64.7	N	.10
January.....17	30.704	1.7	69.7	N	.....
January.....18	30.471	1.7	58.3	NE	.....
January.....19	30.148	24.5	80.3	W	.....
January.....20	29.957	27.5	88.0	N	.08
January.....21	30.012	22.7	82.0	N	.20
January.....22	30.114	22.2	73.0	N	.10
January.....23	30.305	20.7	85.3	N	.03
January.....24	30.278	19.7	80.7	N	.04
January.....25	30.394	14.0	74.3	NW	.....
January.....26	30.619	7.0	64.0	NW	.....
January.....27	30.695	4.7	60.3	NW	.....
January.....28	30.498	14.5	64.0	S	.....
January.....29	29.901	36.2	88.0	SE	.....
January.....30	30.196	22.5	69.0	NE	.....
January.....31	30.099	22.3	77.0	NE	.03
Means.....	30.212	14.1	71.2	N	1.55

GENERAL ITEMS.

Highest barometer, 30.752, January 17.

Lowest barometer, 29.509, January 12.

Highest temperature, 42°, January 30.

Lowest temperature, -19°, January 14.

Prevailing direction of wind, north.

Greatest velocity of wind, 20 miles north, on the 13th.

Total number of miles, 3,854.

Number of fair days, 15.

Number of clear days, 7.

Number of cloudy days, 9.

Number of days on which rain or snow fell, 15.

F. W. CONRAD,
Sergeant Signal Service, U. S. A.

1881—FEBRUARY—1881.

DATE.	Daily mean barometer.	Daily mean temperature.	Daily mean humidity.	Prevailing direction of wind.	Daily rainfall.
February 1	30.449	17.0	78.3	NE	.01
February 2	30.111	24.7	79.0	S	.01
February 3	30.355	18.5	79.7	SE	.....
February 4	30.225	21.5	80.7	SE	.05
February 5	30.056	28.2	84.3	SE	.30
February 6	29.968	32.0	92.7	SE	.90
February 7	29.823	39.2	84.7	S	.34
February 8	29.931	30.7	71.7	SW	.....
Eebruary 9	29.822	30.0	82.7	SW	.....
February 10	30.085	18.7	75.0	NW	.....
February 11	29.865	23.0	86.3	NE	.12
February 12	30.042	14.7	76.3	N	.50
February 13	30.388	10.5	68.0	N	.02
February 14	30.448	12.7	79.0	NE	.05
February 15	30.295	11.0	81.0	NW	.15
February 16	30.554	9.5	69.3	NW	.....
February 17	30.269	15.5	81.7	E	.11
February 18	30.244	14.7	78.0	NE	.03
February 19	30.186	19.5	69.0	SW	.....
February 20	30.248	16.2	73.7	NW	.....
February 21	30.014	33.2	73.0	SW	.....
February 22	30.266	20.7	82.3	NW	.01
February 23	30.471	9.0	72.0	N	.01
February 24	30.010	24.0	73.0	SW	.....
February 25	29.896	29.2	68.3	S	.....
February 26	29.603	34.7	87.3	S	.06
February 27	29.984	10.7	68.0	N	.01
February 28	30.171	13.0	74.3	NW	.....
Means	30.136	20.8	77.5	NW	26.8

GENERAL ITEMS.

Highest barometer 30.587, February 16.

Lowest barometer 29.473, February 26.

Range 1.114

Highest temperature, 45°, February 26.

Lowest temperature, 8°, February 26.

Range, 53°.

Prevailing direction of wind, northwest.

Greatest velocity of wind, 24, SE, 5th, 24, NE, 11th, 24 N, 12th.

Total number of miles, 5,372.

Number of fair days, 8.

Number of clear days, 8.

Number of cloudy days, 12.

Number of days on which rain or snow fell, 18.

Number of days on which no rain or snow fell, 10.

W. F. CONRAD,
Sergeant Signal Service, U. S. A.

1881—MARCH—1881.

DATE.	Daily mean barometer.	Daily mean temperature.	Daily mean humidity.	Prevailing direction of wind.	Daily rainfall.
March 1	29.888	29.0	67.7	S	.....
March 2	29.821	26.5	77.3	SE	.03
March 3	30.001	20.5	71.0	NE	.10
March 4	29.930	15.7	71.3	N	.04
March 5	30.032	20.2	65.0	N	.....
March 6	30.166	26.7	68.0	N	.....
March 7	30.032	30.2	85.0	W	.22
March 8	30.032	30.5	79.0	E	.....
March 9	30.100	29.0	78.7	NW	.....
March 10	30.018	32.5	80.0	N	.02
March 11	29.485	34.7	93.0	SE	1.01
March 12	29.543	26.7	79.7	SE	.15
March 13	30.124	20.5	72.0	N	.....
March 14	30.001	27.0	86.3	NW	.10
March 15	29.991	31.0	68.3	SE	.01
March 16	29.978	31.2	72.7	W	.04
March 17	30.144	26.2	83.0	NW	.....
March 18	30.057	28.5	85.0	NE	.....
March 19	29.813	31.0	85.3	NE	.05
March 20	29.854	27.5	70.0	N	.....
March 21	29.977	25.0	66.7	NW	.....
March 22	30.001	28.7	68.5	NW	.....
March 23	29.838	34.7	73.3	NW	.....
March 24	29.859	38.0	73.7	NW	.....
March 25	30.186	33.0	73.7	NE	*
March 26	30.304	32.5	69.0	NE	.....
March 27	29.912	42.5	73.0	N	.....
March 28	29.960	36.7	81.7	S	*
March 29	30.162	33.2	61.0	NE	.....
March 30	30.040	33.0	61.3	N	.....
March 31	30.079	21.2	71.7	N	.....
Means	29.978	29.1	74.6	N	1.78

* Too small to measure.

GENERAL ITEMS.

Highest barometer, 30.443, March 26.

Lowest barometer, 29.298, March 12.

Range, 1.145.

Highest temperature, 52°, March 27.

Lowest temperature, 6°. March 14.

Range, 46°.

Prevailing direction of wind, north.

Greatest velocity of wind, 32 miles, north—31st.

Total number of miles, 6,472.

Number fair days, 3.

Number fair days on which rain or snow fell, 4.

Number of clear days, 11.

Number of clear days rain or snow fell, 1.

Number of cloudy days, 3.

Number of cloudy days rain or snow fell, 9.

Number of days on which rain or snow fell, 17.

Number of days on which no rain or snow fell, 14.

F. W. CONRAD,
Sergeant Signal Service, U. S. A.

1881—APRIL—1881.

DATE.	Daily mean barometer.	Daily mean temperature.	Daily mean humidity.	Prevailing direction of wind.	Daily rainfall.
April 1	30.327	22.2	63.3	N	.....
April 2	30.058	30.7	84.7	SW	.05
April 3	30.173	29.0	78.0	N	.....
April 4	30.203	23.2	63.7	N	.....
April 5	30.070	27.7	73.0	N	.....
April 6	30.007	34.2	62.0	SE	.....
April 7	29.804	34.0	89.7	SE	.90
April 8	30.001	34.5	89.7	NE	.68
April 9	30.315	31.7	79.0	N	.....
April 10	30.212	33.0	75.7	N	.02
April 11	29.862	34.5	90.0	E	.66
April 12	30.123	28.0	77.0	NE	.10
April 13	30.132	27.0	71.0	NW	.....
April 14	29.767	39.2	69.7	SW	.....
April 15	29.937	42.0	74.3	NW	.....
April 16	29.959	53.2	65.3	NW	.....
April 17	29.655	58.7	63.0	S	.....
April 18	29.958	48.7	80.7	E	.....
April 19	29.923	55.7	70.0	S	.....
April 20	29.993	52.2	74.3	NE	.....
April 21	30.076	50.2	84.0	NE	.58
April 22	30.105	53.0	83.3	SE	.....
April 23	30.020	64.7	71.7	S	.....
April 24	29.808	69.2	63.3	SW	.....
April 25	29.902	59.0	63.7	NW	.13
April 26	29.850	63.2	51.3	SW	.....
April 27	29.984	55.2	61.0	NE	.02
April 28	30.083	56.0	65.7	N	.20
April 29	30.218	56.0	58.3	SE	.02
April 30	29.976	58.7	73.0	S	.....
Means	30.017	44.2	72.3	N	3.36

GENERAL ITEMS.

Highest barometer, 30.395, April 1st.
Lowest barometer, 29.569, April 17th.
Range, 826.
Highest temperature, 81°, April 24th.
Lowest temperature, 11°, April 1st and 13th.
Range, 70°.
Prevailing direction of wind, north.
Greatest velocity of wind, 20, NE, and 20, S, April 27 and 30th.
Total number of miles, 5,412.
Number of clear days, 7.
Number of fair days, 13.
Number of cloudy days, 10.
Number of days on which rain or snow fell, 13.
Number of days on which no rain or snow fell, 17.

F. W. CONRAD,
Sergeant Signal Service, U. S. A.

1881—MAY—1881.

DATE.	Daily mean barometer.	Daily mean temperature.	Daily mean humidity.	Prevailing direction of wind.	Daily rainfall.
May 1	30.119	55.7	68.0	NE	.07
May 2	30.307	51.0	56.0	NE	.....
May 3	30.222	55.5	47.0	SE	.....
May 4	30.055	55.0	82.7	SE	.09
May 5	29.932	63.0	78.0	S	.01
May 6	29.841	71.2	65.3	S	.....
May 7	29.746	70.0	70.3	SW	.07
May 8	29.737	67.9	81.7	SW	.25
May 9	29.723	64.7	94.3	SE	.65
May 10	29.662	71.7	81.0	SW	.75
May 11	29.856	75.5	76.0	SW	.....
May 12	30.185	64.2	85.3	NE	.60
May 13	29.983	67.7	91.3	N	1.05
May 14	29.920	69.7	61.7	N	.....
May 15	29.989	65.2	58.3	NE	.....
May 16	29.976	66.5	62.7	SE	.....
May 17	29.979	67.8	59.0	SE	.....
May 18	29.984	63.9	62.7	SE	.....
May 19	30.034	63.0	62.3	NE	.....
May 20	30.004	64.0	51.3	NE	.....
May 21	29.961	69.7	52.3	SE	.....
May 22	29.988	70.0	51.7	SE	.....
May 23	30.025	69.0	66.0	SE	.....
May 24	30.055	70.0	74.7	SE	.....
May 25	30.013	74.5	67.7	SW	.....
May 26	29.949	75.6	69.0	SW	.....
May 27	29.828	75.4	69.7	SW	.08
May 28	29.665	75.1	71.3	SW	0.2
May 29	29.636	72.1	78.3	S	.20
May 30	29.750	72.2	69.7	S	.....
May 31	29.810	71.9	73.3	N	.....
Means	29.932	67.4	69.0	SE	3.82

GENERAL ITEMS.

Highest barometer, 30.368, on the 3d.
Lowest barometer, 29.574, on the 10th.
Range, .794.
Highest temperature, 88°, on the 25th.
Lowest temperature, 40°, on the 2d.
Range, 48°.
Prevailing direction of wind, southeast.
Greatest velocity of wind, 25 miles, southwest, on the 11th.
Total number of miles, 4,594.
Number of fair days, 14.
Number of clear days, 4.
Number of cloudy days, 13.
Number of days on which rain or snow fell, 11.
Number of days on which no rain fell, 20.

F. W. CONRAD,
Sergeant Signal Service, U. S. A.

1881—JUNE—1881.

DATE.	Daily mean barometer.	Daily mean temperature.	Daily mean humidity.	Prevailing direction of wind.	Daily rainfall.
June. 1	29.860	71.0	75.3	NE	.....
June. 2	29.795	69.5	63.3	N	.22
June. 3	30.007	64.6	59.7	NE	.....
June. 4	29.888	69.7	58.3	S	.....
June. 5	29.620	74.4	73.3	E	.67
June. 6	29.678	61.0	92.3	E	3.84
June. 7	29.734	62.5	88.7	E	.01
June. 8	29.875	65.5	85.7	N	.11
June. 9	29.978	68.2	70.7	SE	.....
June. 10	29.898	72.9	71.0	SE	.....
June. 11	29.695	75.5	76.0	S	.61
June. 12	29.770	66.0	94.7	SW	1.90
June. 13	29.941	68.2	71.0	NW	.....
June. 14	30.009	75.5	66.7	E	.....
June. 15	29.919	79.0	77.7	S	1.14
June. 16	29.893	76.2	70.7	N	.02
June. 17	29.925	73.2	69.7	S	.....
June. 18	29.745	78.0	74.7	S	.02
June. 19	29.814	70.1	88.3	SW	4.05
June. 20	29.907	72.2	75.7	NE	1.09
June. 21	29.976	65.1	74.3	SE	.25
June. 22	30.033	64.2	70.0	E	.....
June. 23	30.061	66.9	69.0	S	.....
June. 24	30.029	70.9	71.0	W	.29
June. 25	29.971	72.5	78.0	SE	.01
June. 26	29.818	69.2	88.3	NW	1.37
June. 27	29.712	79.3	81.7	SW	.....
June. 28	29.736	85.6	77.7	SW	.....
June. 29	29.884	75.7	80.3	SW	.10
June. 30	30.018	77.5	77.0	SE	.09
Means.....	29.873	71.3	75.7	S	15.79

GENERAL ITEMS.

Highest barometer, 30.160, 24th.
Lowest barometer, 29.590, 5th.
Range, .510.
Highest temperature, 95.5°, 28th.
Lowest temperature, 54°, 4th and 7th.
Range, 41.7°.
Prevailing direction of wind, south.
Greatest velocity of wind, 36, southwest, 12th; 36, north, 28th.
Total number of miles, 4,886.
Number of clear days, 3.
Number of fair days, 18.
Number of cloudy days, 9.
Number of days on which rain fell, 21.
Number of days on which no rain fell, 9.

F. W. CONRAD,
Sergeant Signal Service, U. S. A.

1881—JULY—1881.

DATE.	Daily mean barometer.	Daily mean temperature.	Daily mean humidity.	Prevailing direction of wind.	Daily rainfall.
July. 1	30.188	74.0	74.3	SE	.....
July. 2	30.203	73.2	75.0	SW	.....
July. 3	30.136	75.0	70.0	SW	.....
July. 4	30.038	78.3	71.0	SW	.....
July. 5	30.039	81.5	73.3	N	.....
July. 6	29.996	80.3	73.0	SW	*
July. 7	29.864	83.8	72.0	SW	.05
July. 8	29.851	81.7	64.3	SW	.....
July. 9	29.994	72.7	80.3	SE	2.31
July. 10	29.966	76.8	83.7	SE	1.15
July. 11	29.954	81.0	75.7	SW	.20
July. 12	29.894	78.5	81.3	SW	.06
July. 13	29.999	79.3	81.3	SW	.....
July. 14	29.999	80.0	78.0	SE	.....
July. 15	30.048	82.3	81.0	SW	.....
July. 16	30.030	84.8	73.0	W	.....
July. 17	30.056	72.7	79.0	NE	1.80
July. 18	29.974	73.2	79.0	S	.....
July. 19	29.809	76.3	77.7	S	.....
July. 20	29.623	86.3	70.3	SW	.....
July. 21	29.741	78.0	78.3	N	.....
July. 22	30.015	73.8	75.3	N	.....
July. 23	30.035	73.3	70.7	N	.....
July. 24	29.977	69.0	79.0	N	*
July. 25	30.028	69.2	68.0	N	.....
July. 26	30.122	67.0	74.3	N	.....
July. 27	30.144	67.3	70.0	NE	.....
July. 28	30.110	70.7	71.7	S	.....
July. 29	30.100	74.0	67.3	S	.....
July. 30	30.150	73.3	64.7	SE	.....
July. 31	30.114	76.0	65.7	S	.....
Means.....	30.006	76.2	74.1	SW	5.57

*Too small to measure.

GENERAL ITEMS.

Highest barometer, 30.243; date, 2d.
Lowest barometer, 29.583; date, 20th.
Range, .660.
Highest temperature, 98.5°.
Lowest temperature, 56°.
Range, 42.5°.
Prevailing direction of wind, southwest.
Greatest velocity of wind, 20 miles, from southeast, 9th and 10th.
Total number of miles, 4,097.
Number of clear days, 15.
Number of fair days, 11.
Number of cloudy days, 5.
Number of days on which no rain or snow fell, 8.
Number of days on which no rain or snow fell, 23.

F. W. CONRAD,
Sergeant Signal Service, U. S. A.

1881—AUGUST—1881.

DATE.	Daily mean barometer.	Daily mean temperature.	Daily mean humidity.	Prevailing direction of wind.	Daily rainfall.
August 1	30.020	78.7	63.3	S	.....
August 2	29.989	81.0	61.7	SW	.....
August 3	29.964	83.0	56.0	SW	.....
August 4	30.006	84.7	58.7	SW	.....
August 5	29.967	81.2	62.0	W	.13
August 6	30.076	73.3	81.0	NE	.01
August 7	30.072	73.2	70.7	S	.....
August 8	29.898	79.0	56.7	SW	.....
August 9	29.925	83.0	61.0	N	.....
August 10	29.909	83.3	60.7	S	.....
August 11	29.788	86.7	53.0	W	.....
August 12	29.929	77.7	60.3	N	*
August 13	30.020	68.5	74.7	N	.32
August 14	30.091	66.3	75.0	SE	.....
August 15	30.050	71.2	68.3	SE	.....
August 16	29.910	80.9	56.7	S	.....
August 17	29.807	87.8	56.0	SW	*
August 18	29.965	74.8	82.3	NE	.82
August 19	30.015	73.3	75.3	E	*
August 20	29.969	73.0	76.7	SE	.79
August 21	30.057	70.2	76.0	SE	.01
August 22	30.045	71.0	70.7	SE	.....
August 23	30.073	73.7	68.3	SE	.....
August 24	30.080	77.0	66.0	S	.09
August 25	30.016	82.0	61.3	S	.....
August 26	29.922	86.5	50.3	SW	.....
August 27	29.970	83.3	63.0	SE	.....
August 28	29.966	83.3	56.0	SE	.....
August 29	29.877	80.3	68.0	SE	.17
August 30	29.885	71.7	89.0	SW	.80
August 31	29.965	76.3	77.3	SW	2.15
Means	29.975	77.9	66.3	SW	5.42

* Too small to measure.

GENERAL ITEMS.

Highest barometer, 30.143; 7th and 24th.
Lowest barometer, 29.738.
Range, .405.
Highest temperature, 10.3°; 17th.
Lowest temperature, 57°; 15th.
Range, 46°.
Prevailing direction of wind, southwest.
Greatest velocity of wind, 34 miles; southwest, on 31st.
Total number of miles, 4,312.
Number of clear days, 10.
Number of cloudy days, 6.
Number of fair days, 15.
Number of days on which rain or snow fell, 13.
Number of days on which no rain or snow fell, 18.

F. W. CONRAD,
Sergeant Signal Service, U. S. A.

1881—SEPTEMBER—1881.

DATE.	Daily mean barometer.	Daily mean temperature.	Daily mean humidity.	Prevailing direction of wind.	Daily rainfall.
September 1	29.986	73.7	79.3	SW	.40
September 2	29.936	73.7	77.3	S	.24
September 3	29.835	76.3	72.3	SW	.15
September 4	29.650	82.3	56.7	SW	.....
September 5	29.800	81.0	65.3	SW	.50
September 6	29.927	71.3	79.3	N	.31
September 7	30.105	58.3	90.0	NE	.42
September 8	30.133	61.8	77.0	SW	.02
September 9	30.020	67.5	80.3	S	.10
September 10	29.987	57.3	70.7	N	1.08
September 11	30.063	61.0	66.7	SW	.....
September 12	30.120	65.5	64.3	NW	.....
September 13	30.118	67.3	68.7	S	.....
September 14	29.912	63.0	79.3	NW	.32
September 15	29.842	48.0	81.3	N	.03
September 16	29.666	42.0	92.0	SW	.31
September 17	29.997	51.7	84.3	SW	.01
September 18	29.982	66.3	71.7	SW	.....
September 19	29.999	65.5	81.0	NE	.....
September 20	29.939	70.0	70.7	SE	.....
September 21	29.881	75.8	65.0	SW	.....
September 22	29.834	73.0	66.0	SW	.01
September 23	29.701	77.7	64.7	SW	.02
September 24	29.636	72.3	52.7	W	.....
September 25	29.829	68.3	49.3	SW	.....
September 26	29.698	73.2	79.0	SW	.24
September 27	29.948	59.0	65.0	NE	.02
September 28	29.984	56.8	75.7	SE	.....
September 29	29.628	70.0	86.3	SW	.50
September 30	30.000	57.3	72.0	N	.02
Means	29.905	66.2	72.8	SW	4.70

GENERAL ITEMS.

Highest barometer, 30.214, 13th.
Lowest barometer, 29.548.
Range, .666.
Highest temperature, 93°, 5th.
Lowest temperature, 40°, 16th.
Range, 53°.
Prevailing direction of wind, southwest.
Greatest velocity of wind, 36 miles, west, 29th.
Total number of miles, 5,520.
Number of clear days, 6.
Number of fair days, 14.
Number of cloudy days, 10.
Number of days on which rain or snow fell, 21.
Number of days on which no rain or snow fell, 9.

F. W. CONRAD,
Sergeant Signal Service, U. S. A.

1881—OCTOBER—1881.

DATE.	Daily mean barometer.	Daily mean temperature.	Daily mean humidity.	Prevailing direction of wind.	Daily rainfall.
October....1	30.217	60.7	79.3	S	.....
October....2	30.158	66.0	89.0	S	.03
October....3	30.131	71.0	93.3	SE	.01
October....4	30.311	55.0	75.3	NE	1.98
October....5	30.412	51.0	67.0	SE	*
October....6	30.101	60.0	75.7	S	.02
October....7	29.922	73.8	76.0	SW	.....
October....8	30.216	62.3	64.3	NE	*
October....9	30.359	57.3	62.3	NE	.....
October....10	30.306	60.0	57.3	S	.....
October....11	29.887	62.7	84.3	SW	.30
October....12	30.159	46.8	83.7	N	.04
October....13	30.450	44.3	77.3	E	.13
October....14	29.970	52.8	93.0	SW	.41
October....15	30.150	46.0	68.7	N	.06
October....16	30.212	42.7	83.0	SE	.37
October....17	30.159	46.0	84.3	N	1.62
October....18	30.348	45.8	78.0	SW	.....
October....19	30.230	48.5	70.7	W	.....
October....20	30.230	45.0	68.0	S	.....
October....21	30.090	58.0	72.3	S	.12
October....22	30.060	57.0	82.0	SW	.03
October....23	29.969	52.0	93.0	NE	.38
October....24	30.007	48.3	71.3	W	.29
October....25	29.946	53.3	69.0	N	.....
October....26	29.924	56.3	73.0	SW	.32
October....27	29.765	57.8	86.7	S	.35
October....28	29.490	60.0	85.7	S	.....
October....29	29.737	52.7	77.3	NW	.....
October....30	29.971	45.7	77.0	N	.....
October....31	29.829	55.7	63.0	SW	.....
Means.....	30.088	54.7	76.8	S	6.45

* Too small to measure.

GENERAL ITEMS.

Highest barometer, 30.522, on the 13th.
Lowest barometer, 29.435, on the 28th.
Range, 1.087.
Highest temperature 83°, on the 7th.
Lowest temperature 32°, on the 20th.
Range, 51°.
Prevailing direction of wind, south.
Greatest velocity of wind, 23 miles southwest, on the 11th.
Total number of miles, 5,086.
Number of clear days, 6.
Number of fair days, 9.
Number of cloudy days, 16.
Number of days on which rain or snow fell, 19.
Number of days on which no rain or snow fell, 12.

F. W. CONRAD,
Sergeant Signal Service, U. S. A.

1881—NOVEMBER—1881.

DATE.	Daily mean barometer.	Daily mean temperature.	Daily mean humidity.	Prevailing direction of wind.	Daily rainfall.
November....1	29.986	44.3	76.3	N	.32
November....2	30.068	38.7	73.0	N	.17
November....3	30.004	37.0	63.3	NW	.....
November....4	29.731	42.7	67.7	NW	.....
November....5	29.927	49.0	60.3	SW	.....
November....6	29.825	52.0	62.6	SW	.....
November....7	29.683	50.3	84.3	S	.11
November....8	30.148	46.0	72.7	NW	.20
November....9	30.573	37.7	65.7	N	.....
November....10	30.616	35.3	71.7	E	*.32
November....11	29.924	37.7	85.7	SE	†1.67
November....12	29.752	36.0	73.3	NW	.....
November....13	29.971	35.3	83.3	NW	*.14
November....14	30.507	24.0	69.3	N	.....
November....15	30.434	30.3	73.7	S	.....
November....16	29.996	51.0	70.3	SW	.....
November....17	29.996	30.7	82.3	N	.03
November....18	30.219	20.3	80.7	N	*.03
November....19	30.458	17.3	73.7	NW	.....
November....20	30.295	31.3	59.7	SW	.....
November....21	30.401	31.0	68.3	N	.....
November....22	30.244	35.0	73.3	SW	.....
November....23	30.449	16.3	61.3	N	.....
November....24	30.387	15.7	73.7	NW	.....
November....25	29.958	36.0	70.0	W	.....
November....26	30.166	40.0	72.7	W	.....
November....27	30.220	43.3	73.0	NW	.....
November....28	29.936	49.7	80.0	SW	.....
November....29	29.956	38.7	84.0	N	.07
November....30	30.056	28.0	83.3	N	*.91
Means.....	30.130	35.8	72.9	N	3.97

* Melted snow.
† Snow and rain.

GENERAL ITEMS.

Highest barometer, 30.759, 10th.
Lowest barometer, 29.590, 12th.
Range, 1.169.
Highest temperature, 60°, 6th.
Lowest temperature, 6°, 24th.
Range, 54°.
Prevailing direction of wind, north.
Greatest velocity of wind, 26 southwest, 16th, and 26 north, 23d.
Total number of miles, 6,360.
Number of clear days, 6.
Number of fair days, 11.
Number of cloudy days, 13.
Number of days on which rain or snow fell, 12.
Number of days on which no rain or snow fell, 18.

F. W. CONRAD,
Sergeant Signal Service, U. S. A.

1881—DECEMBER—1881.

DATE.	Daily mean barometer.	Daily mean temperature.	Daily mean humidity.	Prevailing direction of wind.	Daily rainfall.
December 1	30.305	33.7	83.3	SW	.....
December 2	30.268	38.3	87.0	SE	.....
December 3	30.405	35.5	89.0	N	.....
December 4	30.380	33.3	85.0	NW	.....
December 5	30.094	37.7	82.0	SW	.....
December 6	29.928	43.0	68.7	N	.....
December 7	30.152	33.0	67.7	S	.01
December 8	30.085	36.7	65.3	NE	.....
December 9	30.467	25.0	75.7	NE	.....
December 10	30.360	31.3	68.3	S	.18
December 11	30.028	36.3	86.7	S	.09
December 12	29.862	38.7	88.0	E	.08
December 13	30.087	28.7	79.0	N	.01
December 14	30.449	28.3	74.3	W	.....
December 15	30.319	39.7	64.3	SW	.....
December 16	30.096	44.0	58.0	W	.....
December 17	30.257	41.3	69.3	NW	.....
December 18	30.341	39.3	72.0	SW	.....
December 19	30.298	43.7	87.0	SW	.29
December 20	30.246	36.7	86.7	NE	.44
December 21	30.023	39.0	93.7	E	.60
December 22	30.122	36.7	85.7	N	.02
December 23	30.316	33.7	72.7	W	.....
December 24	30.175	39.7	72.0	SW	.....
December 25	30.049	42.7	71.7	SW	.....
December 26	30.184	33.7	64.0	NE	.....
December 27	29.800	37.7	75.0	SW	.04
December 28	29.805	39.3	70.0	NW	.....
December 29	30.066	25.0	65.7	N	.01
December 30	30.077	20.0	66.0	NW	.....
December 31	30.143	14.7	64.7	N	.08
Means	30.167	35.0	75.4	SW	1.85

GENERAL ITEMS.

Highest barometer, 30.512, 9th.
Lowest barometer, 29.666, 28th.
Range, .846.
Highest temperature, 56°, 6th.
Lowest temperature, 10°, 30th.
Range, 46°.
Prevailing direction of wind, southwest.
Greatest velocity of wind, 32 miles northeast on the 20th.
Total number of miles, 5,644.
Number of clear days, 5.
Number of fair days, 18.
Number of cloudy days, 8.
Number of days on which rain or snow fell, 12.
Number of days on which no rain or snow fell, 19.

W. F. CONRAD,
Sergeant Signal Service, U. S. A.

1882—JANUARY—1882.

DATE.	Daily mean barometer.	Daily mean temperature.	Daily mean humidity.	Prevailing direction wind.	Daily rainfall.
January 1	30.231	15.7	72.0	NW	.....
January 2	30.193	24.7	70.0	NE	.....
January 3	30.317	26.0	71.3	SE	.....
January 4	30.359	27.0	80.7	E	.22
January 5	30.257	27.0	84.3	S	.....
January 6	30.007	37.7	77.7	W	.....
January 7	29.800	39.3	87.7	SE	.02
January 8	30.109	31.7	69.0	NW	.....
January 9	30.206	34.7	77.7	SW	.....
January 10	30.058	37.0	86.7	S	.17
January 11	30.390	28.3	70.3	NW	.01
January 12	30.169	30.3	79.3	SE	.02
January 13	30.107	22.7	70.0	NW	.05
January 14	29.944	27.7	73.3	SW	.....
January 15	29.950	27.3	68.7	NE	.....
January 16	30.471	9.3	57.0	N	.....
January 17	30.258	14.0	56.7	SW	.....
January 18	30.121	20.3	80.0	N	.....
January 19	30.196	22.3	80.7	S	.....
January 20	29.941	37.0	73.7	SW	.....
January 21	30.334	24.3	64.3	N	.....
January 22	30.651	20.3	68.7	NW	.....
January 23	30.596	15.7	72.3	E	.....
January 24	30.092	28.3	71.3	S	.01
January 25	29.665	46.3	82.7	S	.01
January 26	29.917	32.7	83.7	N	.10
January 27	30.105	34.0	66.7	S	.....
January 28	30.492	7.3	62.0	N	.....
January 29	30.510	17.7	72.0	SW	.....
January 30	30.023	27.7	70.3	SW	.01
January 31	29.798	32.7	75.0	W	.01
Summaries	935.267	82.70	2275.8	.....	.63
Means	30.170	26.7	7.34	S and SW	.....

GENERAL ITEMS.

Highest barometer, 30.721, 23d.
Lowest barometer, 29.511, 26th.
Monthly range of barometer, 1.210.
Highest temperature, 51°, 25th and 26th.
Lowest temperature.—1°, 17th and 29th.
Range, 52°.
Greatest daily range of temperature, 37°, 28th.
Least daily range of temperature, 3°, 10th.
Mean of maximum temperatures, 17.8°.
Mean of minimum temperatures, 34.6°.
Mean daily range of temperature, 16.8°.
Prevailing direction of wind, S and SW.
Total movement of wind, 5,663 miles.
Highest velocity of wind and direction, 27, N, 26th.
Number of clear days, 7.
Number of fair days, 13.
Number of cloudy days, 11.
Number of cloudy days on which no rain or snow fell, 3.
Number of cloudy days on which rain or snow fell, 8.
Total number of days on which rain or snow fell, 13.
Dates of lunar halos, 2, 6, 12, 29, 30, 31.
Dates of frosts, 9, 12, 14, 15, 16, 17, 18, 19, 21, 22, 23, 27, 28.

F. W. CONRAD,
Sergeant Signal Corps, U. S. A.

1882—FEBRUARY—1882.

DATE.	Daily mean barometer.	Daily mean temperature.	Daily mean humidity.	Prevailing direction of wind.	Daily rainfall.
February 1	30.053	32.3	72.3	NW	.....
February 2	30.088	35.0	69.7	NW	.....
February 3	30.090	39.3	61.0	NW	.....
February 4	29.943	38.0	65.0	NW	.....
February 5	29.966	44.0	61.7	W	.....
February 6	29.814	48.8	67.0	SW	.....
February 7	30.209	31.7	59.3	N	.....
February 8	30.114	31.3	61.7	SW	.....
February 9	30.082	39.3	54.3	N	.....
February 10	30.074	43.7	59.7	SE	.....
February 11	29.897	55.0	69.3	S	.....
February 12	29.885	52.7	63.3	NW	.....
February 13	30.204	39.0	59.3	NW	.....
February 14	30.115	40.5	52.3	W	.....
February 15	29.895	47.3	57.7	SW	.....
February 16	30.092	34.3	74.7	N	.....
February 17	30.371	32.7	75.7	SE	.02
February 18	30.063	37.0	83.0	S	.62
February 19	30.343	20.7	67.0	NE	.....
February 20	29.785	23.0	72.3	NE	.44
February 21	30.050	12.7	74.3	NW	.07
February 22	30.331	11.3	61.3	NW	.....
February 23	30.419	16.7	76.3	NW	.....
February 24	30.335	33.0	77.0	S	.....
February 25	30.138	41.3	86.0	SW	.....
February 26	30.088	39.3	79.0	NW	.01
February 27	29.722	44.0	89.3	NE	.04
February 28	29.651	44.3	81.0	NW	.01
Summaries	841.817	1008.2	1930.8	NW	1.21
Means	30.065	36.0	69.0	.....	.....

GENERAL ITEMS.

Highest barometer, 30.465, 23d.
Lowest barometer, 29.582, 19th.
Monthly range of barometer, .883.
Highest temperature, 65°, 11th and 12th.
Lowest temperature, 1°, 22d.
Range temperature, 64°.
Greatest daily range of temperature, 30°, 5th.
Least daily range of temperature, 6°, 1st.
Mean of maximum temperatures, 45.5°.
Mean of minimum temperatures, 27.0°.
Mean daily range of temperature, 18.5°.
Prevailing direction of wind, SW.
Total movement of wind, 5,470 miles.
Highest velocity and direction of wind, 28, SW, 12th.
Number of clear days, 10.
Number of fair days, 12.
Number of cloudy days on which no rain or snow fell, 5.
Number of cloudy days on which rain or snow fell, 1.
Total number of days on which rain or snow fell, 8.

F. W. CONRAD,
Sergeant Signal Corps, U. S. A.

1882—MARCH—1882.

DATE.	Daily mean barometer.	Daily mean temperature.	Daily mean humidity.	Prevailing direction of wind.	Daily rainfall.
March 1	29.811	50.3	60.0	W	.....
March 2	30.145	47.3	62.3	NE	.....
March 3	30.156	46.7	61.7	SE	.....
March 4	29.706	47.7	70.3	SE	.04
March 5	30.036	31.0	63.3	NW	.....
March 6	30.410	22.0	68.0	NW	.....
March 7	30.618	24.0	69.7	N	.....
March 8	30.280	31.7	75.3	E	.13
March 9	30.025	31.3	77.3	N	.23
March 10	30.416	30.0	62.7	NW	.....
March 11	30.179	28.0	76.3	E	.....
March 12	30.081	31.7	70.0	N	.....
March 13	30.238	27.0	68.3	S	.....
March 14	29.916	35.3	80.7	SE	.03
March 15	30.185	37.3	70.7	NW	.....
March 16	30.183	39.3	79.3	S	.....
March 17	29.654	46.7	85.0	S	.29
March 18	30.015	43.0	68.3	N	.....
March 19	30.071	40.0	67.3	SE	.01
March 20	29.728	38.7	73.3	NW	.11
March 21	30.135	22.3	68.0	NW	.....
March 22	30.428	33.3	53.3	SW	.....
March 23	30.390	34.3	61.0	N	.....
March 24	30.419	27.0	67.7	S	.....
March 25	29.745	56.3	58.7	SW	.01
March 26	29.545	51.3	85.3	SW	1.43
March 27	29.947	38.7	58.3	N	.....
March 28	29.733	49.3	56.0	SW	.....
March 29	30.015	44.0	58.3	N	.....
March 30	30.505	33.7	59.3	N	.....
March 31	30.107	51.7	58.3	SW	.....
Summaries	932.872	1170.9	2094.0	N	2.28
Means	30.093	37.8	67.6	.....	.....

GENERAL ITEMS.

Highest barometer, 30.677, 7th.
Lowest barometer, 29.422, 26th.
Monthly range of barometer, 1.255.
Highest temperature, 74°, 25th.
Lowest temperature, 10°, 24th.
Range, 64°.
Greatest daily fange of temperature, -41°, 25th.
Least daily range of temperature, 5°, 9th.
Mean of maximum temperatures, 46.6°.
Mean of minimum temperatures, 28.4°.
Mean daily range of temperature, 18.2°.
Prevailing direction of wind, north.
Total movement of wind, 7,188 miles.
Highest velocity of wind and direction, 32, west; 32, northwest; 32 southwest.
Number of clear days, 4.
Number of fair days, 16.
Number of cloudy days on which no rain or snow fell, 3.
Number of cloudy days on which rain or snow fell, 8.
Total number of days on which rain or snow fell, 15.
Dates of lunar halos, 1st.
Dates of frosts, 1, 2, 5, 11, 12, 13, 14, 15, 19, 22, 24, 28, and 31.

F. W. CONRAD,
Sergeant Signal Service, U. S. A.

1882—APRIL—1882.

DATE.	Daily mean barometer.	Daily mean temperature.	Daily mean humidity.	Prevailing direction of wind	Daily rainfall.
April 1	29.903	65.7	56.3	SW	.....
April 2	30.067	67.0	46.0	SE	.....
April 3	29.959	69.0	60.0	SW	.....
April 4	30.081	49.7	78.7	E	.48
April 5	29.882	52.7	90.7	S	1.10
April 6	29.799	54.7	76.0	W	.15
April 7	30.011	58.3	75.7	E	.....
April 8	29.827	60.7	76.0	SE	.56
April 9	29.762	49.7	80.7	W	.01
April 10	30.162	38.7	61.3	E	.....
April 11	30.195	36.7	62.0	SE	.....
April 12	30.184	40.3	58.0	E	.....
April 13	30.197	44.0	63.0	NE	.....
April 14	30.239	42.3	53.0	N	.....
April 15	30.194	44.0	66.0	SW	.....
April 16	30.183	49.0	54.3	SW	.....
April 17	30.072	56.0	48.7	S	.....
April 18	29.572	57.3	70.0	S	.34
April 19	29.674	50.7	76.7	N	.10
April 20	29.813	51.7	65.0	SE	.....
April 21	29.754	47.3	64.0	SE	.21
April 22	29.690	42.7	79.7	SE	.21
April 23	30.029	43.0	72.7	E	.01
April 24	30.117	49.7	62.7	SE	.....
April 25	29.923	56.0	70.3	SE	.18
April 26	29.984	55.0	60.7	N	.12
April 27	30.108	54.7	51.0	W	.....
April 28	30.239	47.7	59.0	N	.....
April 29	30.317	45.3	54.0	N	.....
April 30	30.206	48.7	50.3	W	.....
Summaries	900.143	1528.6	1942.5	.....	.....
Means	30.005	51.0	64.7	SE	3.47

GENERAL ITEMS.

Highest barometer, 30.333, 29th.
Lowest barometer, 29.365, 18th.
Monthly range of barometer, .968.
Highest temperature, 83°, 1st.
Lowest temperature, 31°, 11th.
Range, 52°.
Greatest daily range of temperature, 38°, 1st.
Least daily range of temperature, 5°, 19th.
Mean of maximum temperatures, 68.5°.
Mean of minimum temperatures, 42.2°.
Mean daily range of temperatures, 18.3°.
Prevailing direction of wind, southwest.
Total movement of wind, 6351 miles.
Highest velocity of wind and direction, 32, southwest.
Number of clear days, 5.
Number of fair days, 12.
Number of cloudy days on which rain or snow fell, 6.
Total number of days on which rain or snow fell, 13.
Dates of auroras—16th, 8:30 P. M., and continued until 5 A. M., on the 17th.
Dates of frosts—15th, 16th, 20th, 27th, and 30th.

F. W. CONRAD,
Sergeant Signal Corps, U. S. A.

1882—MAY—1882.

DATE.	Daily mean barometer.	Daily mean temperature.	Daily mean humidity.	Prevailing direction of wind.	Daily rainfall.
May 1	30.166	49.7	54.0	NE	.....
May 2	30.194	51.7	53.0	S	.....
May 3	29.840	63.7	74.7	S	.20
May 4	29.615	70.3	76.3	S	.....
May 5	29.750	49.7	87.3	E	2.81
May 6	30.000	48.7	66.0	E	.....
May 7	29.813	51.3	87.3	E	.37
May 8	29.636	66.0	72.0	S	.29
May 9	29.561	66.7	71.7	S	.66
May 10	29.636	57.7	79.0	W	.01
May 11	29.805	44.3	89.7	NE	.24
May 12	29.950	44.7	81.0	NE	.13
May 13	30.019	52.7	58.7	NE	.01
May 14	30.039	56.7	51.7	N	.....
May 15	30.143	53.0	52.0	NE	.....
May 16	30.239	55.0	56.0	S	.....
May 17	30.243	60.3	55.0	S	.....
May 18	30.105	61.0	65.0	S	.02
May 19	29.867	66.7	66.0	SW	.....
May 20	29.975	50.7	78.3	N	.76
May 21	30.121	43.7	62.7	NW	.01
May 22	30.211	46.3	60.7	N	.18
May 23	30.248	49.7	66.7	SW	.....
May 24	30.132	49.3	86.0	SE	.26
May 25	30.043	53.3	73.7	S	1.30
May 26	29.841	54.7	90.7	E	1.26
May 27	29.855	52.7	83.7	NE	.....
May 28	30.032	53.3	67.0	NE	.....
May 29	29.995	58.7	69.0	S	.....
May 30	29.697	64.7	76.0	SW	.03
May 31	29.819	54.7	75.3	NE	.....
Summaries	928.590	1699.7	2186.2	.....	8.53
Means	29.955	54.8	70.5	NE	.....

GENERAL ITEMS.

Highest barometer, 30.330; 2d.
Lowest barometer, 29.506; 9th.
Monthly range of barometer, .824.
Highest temperature, 83°; 4th.
Lowest temperature, 33°; 2d.
Greatest daily range of temperature, 32°; 2d and 16th.
Lowest daily range of temperature, 4°; 27th.
Mean of maximum temperatures, 65.5°.
Mean of minimum temperatures, 47°.
Mean daily range of temperature, 18.5°.
Prevailing direction of wind, northeast.
Total movement of wind, 6,268 miles.
Highest velocity of wind and direction, 26 south; 26 southwest; 26 northwest.
Number of clear days, 6.
Number of fair days, 9.
Number of cloudy days on which no rain or snow fell, 3.
Number of cloudy days on which rain or snow fell, 13.
Total number of days on which rain or snow fell, 18.
Dates of lunar halos, 29th.
Dates of frost, 2d, 16th, and 22d.

F. W. CONRAD,
Sergeant Signal Corps, U. S. A.

1882—JUNE—1882.

DATE.	Daily mean barometer.	Daily mean temperature.	Daily mean humidity.	Prevailing direction of wind.	Daily rainfall.
June 1	29.803	57.3	73.7		.03
June 2	29.719	56.7	84.0		.45
June 3	29.919	53.0	59.0		
June 4	30.026	56.7	64.3		.01
June 5	30.162	59.3	58.0		
June 6	30.101	64.7	59.0		
June 7	29.887	68.7	60.3		
June 8	29.770	73.3	71.7		.04
June 9	29.756	71.7	76.7		.12
June 10	29.814	61.7	87.7		3.51
June 11	30.019	60.7	59.0		
June 12	29.983	66.3	77.0		
June 13	29.834	66.0	87.0		.43
June 14	29.798	71.3	74.0		.53
June 15	29.914	73.0	73.0		.11
June 16	19.750	75.7	69.7		.01
June 17	29.517	75.7	76.3		.26
June 18	29.685	65.7	59.7		
June 19	30.035	58.7	65.3		
June 20	29.928	60.3	82.0		.44
June 21	30.010	69.7	83.7		.03
June 22	29.968	77.3	78.0		1.51
June 23	29.931	74.0	79.3		.55
June 24	29.823	78.7	75.0		
June 25	29.925	69.3	81.3		.52
June 26	30.017	70.3	81.0		
June 27	29.957	74.7	82.0		.04
June 28	29.914	70.0	88.3		2.75
June 29	29.770	77.7	84.0		.32
June 30	29.744	77.7	76.7		.50
Summaries	896.479	2035.9	2226.7		12.16
Means	29.883	67.9	74.2		

GENERAL ITEMS.

Highest barometer, 30.200, 5th.
Lowest barometer, 29.392, 17th.
Monthly range of barometer, .808.
Highest temperature, 92°, 22d.
Lowest temperature, 44°, 1st.
Range, 48°.
Greatest daily range of temperature, 30°, 5th and 6th.
Least daily range of temperature, 5°, 20th.
Mean of maximum temperatures, 77.9°.
Mean of maximum temperatures, 59.5°.
Mean daily range of temperature, 18.4°.
Prevailing direction of wind, southeast and southwest.
Total movement of wind, 5,262 miles.
Highest velocity of wind and direction, 29 northwest, 22d.
Number of clear days, 3.
Number of fair days, 9.
Number of cloudy days on which no rain or snow fell, 14.
Number of cloudy days on which rain or snow fell, 4.
Number of days on which rain or snow fell, 20.

F. W. CONRAD,
Sergeant Signal Corps, U. S. A.

1882—JULY—1882.

DATE.	Daily mean barometer.	Daily mean temperature.	Daily mean humidity.	Prevailing direction of wind.	Daily rainfall.
July 1	29.955	74.0	71.0		
July 2	30.032	72.7	75.3		
July 3	29.924	72.0	74.7		.75
July 4	30.173	62.3	69.7		
July 5	30.101	66.3	68.0		
July 6	29.880	64.0	86.0		.41
July 7	29.784	71.0	77.0		
July 8	29.875	74.3	74.0		
July 9	29.892	69.0	79.7		.17
July 10	29.907	68.7	61.7		
July 11	29.952	64.0	77.0		.16
July 12	29.994	63.0	64.3		.01
July 13	30.080	58.7	85.7		.23
July 14	30.085	65.3	66.3		
July 15	29.882	66.7	87.0		1.19
July 16	30.014	66.7	77.7		.01
July 17	30.020	65.0	78.3		.05
July 18	30.023	65.3	73.7		.18
July 19	30.108	62.3	74.0		.02
July 20	30.200	63.7	69.0		
July 21	30.268	64.7	66.7		
July 22	30.265	68.0	68.7		
July 23	30.164	71.0	63.0		
July 24	30.002	75.3	69.0		
July 25	29.980	77.0	64.3		
July 26	30.004	78.7	64.0		
July 27	29.997	74.7	74.0		
July 28	30.020	73.3	69.3		.01
July 29	30.049	66.3	89.0		.90
July 30	29.970	65.3	88.0		.69
July 31	29.974	69.0	81.0		
Summaries	930.574	2118.3	2287.1		
Means	30.018	68.3	73.8		4.78

GENERAL ITEMS.

Highest barometer, 30.316, 22d.
Lowest barometer, 29.752, 7th.
Monthly range of barometer, .564.
Highest temperature, 92°, 26th.
Lowest temperature, 52°, 14th.
Range, 40°.
Greatest daily range of temperature, 28°, 10th.
Least daily range of temperature, 6°, 29th.
Mean of maximum temperatures, 78.8°.
Mean of minimum temperatures, 60.6°.
Mean daily range of temperature, 18.2°.
Prevailing direction of wind, N, NW and S.
Total movement of wind, 4,430 miles.
Highest velocity of wind and direction, 20.
Number of clear days, 7.
Number of fair days, 16.
Number of cloudy days on which no rain or snow fell, 1.
Number of cloudy days on which rain or snow fell, 7.
Total number of days on which no rain or snow fell, 15.

F. W. CONRAD,
Sergeant Signal Corps, U. S. A.

1882—AUGUST—1882.

DATE.	Daily mean barometer.	Daily mean temperature.	Daily mean humidity.	Prevailing direction of wind.	Daily rainfall.
August 1	29.972	71.7	74.7	.....	.02
August 2	29.980	67.3	80.0	.....	.....
August 3	29.936	67.3	85.3	.....	.10
August 4	29.925	69.7	83.7	.....	.20
August 5	29.976	69.7	90.0	.....	.22
August 6	30.034	70.3	83.7	.....	.....
August 7	29.998	74.0	75.0	.....	——*
August 8	30.020	67.3	63.0	.....	.....
August 9	30.082	63.3	64.0	.....	.....
August 10	30.126	63.0	71.3	.....	.....
August 11	29.974	70.3	66.7	.....	.....
August 12	29.912	74.0	62.3	.....	.....
August 13	29.827	75.3	69.7	.....	——*
August 14	29.813	77.7	72.3	.....	——*
August 15	29.890	72.7	73.7	.....	.42
August 16	30.048	70.3	70.3	.....	.....
August 17	30.129	70.7	73.3	.....	.....
August 18	30.131	72.7	66.3	.....	.....
August 19	30.150	73.7	66.3	.....	.....
August 20	30.168	74.3	64.0	.....	.....
August 21	30.096	74.7	66.0	.....	.....
August 22	30.020	76.7	66.7	.....	.....
August 23	29.993	77.7	64.0	.....	.....
August 24	29.922	75.3	77.7	.....	2.13
August 25	29.900	72.0	82.0	.....	.....
August 26	29.974	74.7	76.3	.....	.....
August 27	30.030	73.7	70.7	.....	.....
August 28	30.006	72.7	75.7	.....	.....
August 29	30.061	69.7	71.3	.....	.....
August 30	30.091	61.7	77.3	.....	.05
August 31	30.125	62.0	73.0	.....	.....
Summaries	930.309	2206.2	2256.3	.....	3.14
Means	30.010	71.2	72.8	.....	.....

*Inappreciable.

GENERAL ITEMS.

Highest barometer, 30.207, 20th.
Lowest barometer, 29.277, 13th.
Monthly range of barometer, .930.
Highest temperature, 91°, 23d.
Lowest temperature, 51°, 10th.
Range, 40°.
Greatest daily range of temperature, 25°, 21st.
Least daily range of temperature, 4°, 30th.
Mean of maximum temperatures, 81.5°.
Mean of minimum temperatures, 63.5°.
Mean daily range of temperature, 18°.
Prevailing direction of wind north.
Total movement of wind, 3,623 miles.
Highest velocity of wind and direction, 18, south, 12th.
Number of clear days, 9.
Number of fair days, 13.
Number of cloudy days on which no rain or snow fell, 6.
Number of cloudy days on which rain or snow fell, 3.
Total number of days on which rain or snow fell, 10.

F. W. CONRAD,
Sergeant Signal Corps, U. S. A.

1882—SEPTEMBER—1882.

DATE.	Daily mean barometer.	Daily mean temperature.	Daily mean humidity.	Prevailing direction of wind.	Daily rainfall.
September 1	30.004	58.3	79.7	.....	.03
September 2	29.958	61.7	69.7	.....	.02
September 3	30.083	63.3	73.3	.....	.01
September 4	30.238	65.7	72.0	.....	.....
September 5	30.209	68.3	69.3	.....	.....
September 6	30.083	70.3	76.3	.....	.....
September 7	29.982	70.0	70.3	.....	.....
September 8	30.063	70.0	70.0	.....	.....
September 9	30.114	69.0	77.0	.....	.....
September 10	30.053	69.3	71.7	.....	.....
September 11	30.024	64.7	65.3	.....	.....
September 12	29.828	70.3	69.0	.....	——*
September 13	29.806	73.3	66.0	.....	.....
September 14	30.019	69.3	62.0	.....	.....
September 15	30.046	73.3	62.0	.....	.....
September 16	29.921	77.3	62.0	.....	.....
September 17	29.798	77.3	63.7	.....	.....
September 18	29.772	76.0	60.3	.....	.....
September 19	30.068	60.3	60.3	.....	——*
September 20	30.272	49.7	62.7	.....	.....
September 21	30.252	50.3	65.0	.....	.....
September 22	30.176	55.3	55.7	.....	.....
September 23	30.252	53.0	55.7	.....	.....
September 24	30.197	58.7	61.0	.....	.03
September 25	30.327	57.7	73.7	.....	.....
September 26	30.252	58.0	66.0	.....	.....
September 27	29.964	56.7	66.3	.....	.....
September 28	29.827	58.7	82.7	.....	.05
September 29	30.032	61.7	77.7	.....	.01
September 30	30.161	58.7	86.0	.....	.....
Summaries	901.841	1926.2	2053.4	.....	.15
Means	30.061	64.2	68.4	.....	.....

* Inappreciable.

GENERAL ITEMS.

Highest barometer, 30.379, 25th.
Lowest barometer, 29.682.
Monthly range of barometer, .697.
Highest temperature, 92°, 18th.
Lowest temperature, 37°, 23d.
Range, 55°.
Greatest daily range of temperature, 34°, 15th.
Least daily range of temperature, 8°, 28th.
Mean of maximum temperatures, 76.2°.
Mean of minimum temperatures, 54.8°.
Mean daily range of temperature, 21.5°.
Prevailing direction of wind, southeast.
Total movement of wind, 3,465 miles.
Highest velocity of wind and direction, 20, southwest, 18th.
Number of clear days, 10.
Number of fair days, 15.
Number of cloudy days on which no rain or snow fell, 2.
Number of cloudy days on which rain or snow fell, 8.
Dates of frosts, 23d. (Light frost—first of the season.)

W. F. CONRAD,
Sergeant Signal Corps, U. S. A.

[TABLE IV.]

COMPARATIVE METEOROLOGICAL OBSERVATIONS.

For the period from October 1, 1880, to October 1, 1882. Furnished the State Board of Health by F. W. Conrad, Sergeant U. S. Signal Corps at Des Moines.

Latitude, 41° 35'. Longitude, 90° 40'. Above sea level, 849 feet.

	Year.	Oct.	Nov.	Dec.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Total.
Highest Barometer.	1880	30.532 12	30.768 21	30.755 9										
	1881	30.522 13	30.759 16	30.512 9	30.752 17	30.587 16	30 443 26	30.395 1	30.368 3	30.100 24	30.243 2	30.143 7, 24	30.214 13	
	1882				30.721 23	30.465 23	30.677 7	30.333 29	30.330 2	30.200 5	30.316 22	30.207 30	30.379 25	
Lowest Barometer.	1880	29.281 15	29.475 10	29.283 8										
	1881	29.435 28	29.590 12	29.666 28	29.569 12	29.473 25	29.228	29.569 17	29.574 10	29.590 30	29.583 30	29.738 11	29.548 29	
	1882				29.511 26	29.582 19	29.422 26	29.365 18	29.566 9	29.392 17	29.752 7	29.277 13	29.682 25	
Monthly Range of Barometer.	1880	1.251	1.292	1.472										
	1881	1.087	1.169	0.846	1.243	1.114	1.145	0.826	0.794	0.510	6.60	0.405	6.66	
	1882				1.210	0.883	1.255	0.968	0.824	0.808	0.564	0.930	0.697	
Daily Mean of Barometer.	1880	30.052	30.205	30.189										
	1881	30.088	30.130	30.167	30.212	30.136	29.978	30.017	29.932	29.873	30.206	29.975	29.905	
	1882				30.170	30.065	30.093	30.005	29.955	29.883	30.018	30.010	30.061	
Highest Temperature.	1880	77 8	62 1, 2	49 11, 12										
	1881	83 7	60 6	56 6	42 30	45 26	52 27	81 24	88 25	95.5 28	98.5 29	103 17	93.5 5	
	1882				51 25, 26	65 11, 12	74 25	83 1	83 4	92 22	92 26	91 23	92 18	
Lowest Temperature.	1880	26 23	0 21	17 29										
	1881	32 29	6 24	10 30	— 19 14	— 8 11, 16	6 14	11 1, 13	40 2	54.0 4, 7	56.0 26	57 15	40 16	
	1882				— 1 17, 29	1 22	10 24	31 11	33 2	44 1	52 14	51 10	37 23	
*Greatest Daily Range of Temperature.	1880	32 12	28 8	30 10										
	1881	27 26	32 17	25 14	42 19	37 19	33 1	34 23	32 21	28 4	28 28	31 8	30 6, 18	
	1882				37 28	30 5	41 25	38 1	32 2, 16	30 5, 6	28 10	25 21	34 15	
*Least Daily Range of Temperature.	1880	5 6	6 11	3 17										
	1881	5 17	4 12	2 22	5 21	8 7	7 8, 18	3 11	7 9	8 6	10 25	8 18	6 16	
	1882				3 10	6 1	5	5 19	4 27	5 20	6 29	4 30	8 28	
*Mean of Maximum Temperature.	1880	59.2	37.1	21.1										
	1881	63.9	43.7	41.5	23.0	29.1	36.9	53.4	78.2	81.7	88.1	90.6	77.6	
	1882				34.6	45.5	46.6	60.5	65.5	77.9	78.8	81.5	76.2	
*Mean of Minimum Temperature.	1880	40.0	20.2	12.1										
	1881	46.9	28.5	28.2	4.2	11.5	21.6	34.6	58.5	62.9	67.6	68.1	57.4	
	1882				17.8	27.0	28.4	42.2	47.0	59.5	60.6	63.5	54.8	

Mean Daily Temperature	1880	19.0	16.9	19.										
	1881	17.0	15.3	13.3	18.9	18.2	15.3	18.8	19.8	18.7	20.5	22.4	20.2	
	1882				16.8	18.5	18.2	18.3	18.5	18.4	18.2	18.0	21.5	
Daily Mean Temperature	1880	49.2	28.2	20.1										
	1881	54.7	35.8	35.0	14.1	20.8	29.1	44.2	67.4	71.3	76.2	77.3	66.2	
	1882				26.7	36.0	37.8	51.0	54.8	67.9	68.3	71.2	64.2	
Daily Mean Humidity.	1880	64.4	66.6	72.1										
	1881	76.8	72.9	75.4	71.2	77.5	74.6	72.3	69.0	75.7	74.1	66.3	72.8	
	1882				73.4	69.0	67.6	64.7	70.5	74.2	73.8	72 8	68.4	
Prevailing Direction of Wind.	1880	N	N W	N W										
	1881	S	N	S W	N	N W	N	N	S E	S	S W	S W	S W	
	1882				S & S W	S W	N	S E	N E	S E & S W	N N W & S	N	S E	
Highest Velocity and Direction of Wind.	1880	24 m N 16	24 m N 15	26 m N W 5										
	1881	28 m S W 11	26 m S W 16	32 m N E 29	20 m N 13	24 m N E & N 5, 11, 12	32 m N 31	20 m N E 29, 27, 30	25 m S W 11	36 m S W 12, 28	20 m S E 9, 10	34 m S W 31	36 m W 29	
	1882				27 m N 26	28 m S W 13	32 m W S W N W	32 m S W	26m S S W & N W	29 m N W 22	20 m	18 m S 12	20 m S W 18	
Clear Days.	1880	13	13	7										33
	1881	6	6	5	7	8	11	7	4	3	15	10	6	104
	1882				7	10	4	5	6	3	7	9	10	61
Fair Days.	1880	12	12	12										36
	1881	9	11	18	15	8	3	13	14	18	11	15	14	130
	1882				13	12	16	12	9	9	16	13	15	115
Days on which Rain or Snow Fell.	1880	4	1	21										26
	1881	19	12	12	15	18	17	13	11	21	8	13	21	163
	1882				8	1	15	6	18	20	15	10	8	101
Greatest Daily Rain-Fall. (Inches.)	1880	2.75 15	0.73 10	0.34 17										
	1881	1.98 4	1.67 11	0.60 21	0.55 15	0.90 6	1.01 11	0.90 17	1.05 13	4.05 19	2.31 9	2.15 31	1.08 10	
	1882				0.22 4	0.62 20	1.43 26	1.10 5	1.30 25	3.51 10	1.19 15	2.13 24	.05 28	
Total Rain-Fall. (Inches)	1880	4.90	1.97	0.86										7.53
	1881	6.45	3.97	1.85	1.55	2.68	1.78	3.36	3.82	15.79	5.57	5.42	4.70	56.76
	1882				0.63	1.21	2.28	3.47	8.53	12.16	4.78	3.14	.15	37.35
Comparative Temperature.	1878	50.4	42.2	19.9										
	1879	59.7	39.3	21.4	18.7	25.2	39.90	51.2	64.2	70.1	77.7	73.4	60.4	
	1880	49.2	28.2	20.1	38.2	32.3	38.00	50.5	68.5	71.8	74.4	73.1	62.2	
	1881	54.7	35.8	35.0	14.4	20.5	29.1	44.2	67.4	71.3	76.2	77.9	66.2	
	1882				26.7	36.0	37.8	51.0	54.8	67.9	68.3	71 2	64.2	
Comparative Precipitation. (Inches.)	1878	2.84	0.34	1.15								2.21	2.00	
	1879	3.15	6.49	1.39	0.69	1.90	1.68	1.03	4.74	6.69	0.29	1.98	2.79	
	1880	4.90	1.97	0.86	0.70	0.17	0.70	1.56	5.84	4.11	3.82	6.69	5.39	
	1881				1.55	2.68	1.78	3.36	3.821	15.79	5.57	5.29	4.70	
	1882				0.93	1.21	2.28	3.47	8.53	12.16	4.78	3.14	0.15	
Average fall of Rain and Melted Snow in inches*	1851 to 1882	3.65	3.27	2.34	1.52	2.21	2.78	3.79	4.95	4.59	4.68	5.69	4.29	44.27

COMPARATIVE METEROLOGICAL OBSERVATIONS—CONTINUED.

	Year.	Oct.	Nov.	Dec.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Total.
Rain and Melted Snow.*	1881	7.03	2.85	1.75	1.45	3.49	2.58	2.11	2.43	10.35	3.77	1.36	6.59	45.76
Average number of rainy or snowy days.	1851 to 1882	7	8	7	6	7	8	8	10	8½	8½	7½	8	77
Rainy or Snowy Days.	1881	14	9	8	9	11	9	9	11	18	7	6	13	124
Wet and Dry Months.*	1881	Wet.	Wet.	Wet.	16 inches Snow. Dry.	15 inches Snow. Dry.	19 inches Snow. Dry.	8½ inches Snow. Wet.	Wet.	Wet.	Dry.	Dry.	Wet.	....
Mean Temperature.*	1851 to 1882	49.2	3.67	2.37	20.9	24.7	31.1	48.7	51.8	66.9	72.3	70.2	62.2	.....
Mean Temperature.*	1881	Warm. 54	Cold. 29.9	Warm. 35.0	Cold. 11.1	Cold. 20.6	Cold. 28.0	Cold. 42.7	Warm. 66.6	Warm. 69.1	Warm. 75.2	Warm. 76.7	Warm. 69.6	.....

*Observations taken at Muscatine.
First frost in 1882, Sept. 23; in 1880, frosts Sept. 9, 13, 14, 21, 27, 29, 30; in 1881, Sept. 28.

[TABLE V.]

METEOROLOGICAL SUMMARY

For the year ending December 31, 1881, Davenport, Iowa.

Latitude, 41° 30′ North, Longitude, 90° 38′ West.

MONTH.	Mean Barometer.	TEMPERATURE. Mean.	Highest.	Lowest.	Mean relative humidity.	WIND. Prevailing direction.	Max. velocity. (Miles per hour.)	Total movement.	WEATHER. No. of clear days.	No. of fair days.	No. of cloudy days.	Average cloudiness (Scale 0 to 10).	RAIN AND MELTED SNOW. (Inches and 100ths.) Days rain or fell.	Total amount.	Greatest daily amount.
January	30.177	13.8	40	*—21	73.0	W	25	4794	7	12	12	5.5	13	1.34	0.82
February	30.177	19.9	48	— 7	77.6	E	27	7006	5	10	13	6.5	16	4.14	1.12
March	29.917	28.8	45	7	75.2	NW	40	7712	5	15	11	6.4	13	3.35	0.80
April	29.998	44.6	77	16	69.4	NW	25	4713	6	15	9	5.9	11	1.11	0.28
May	29.960	69.0	88	38	59.6	E	30	5345	12	14	5	4.3	12	1.34	0.59
June	29.911	69.7	89	51	70.9	E	32	5187	4	16	10	6.0	21	7.94	1.95
July	30.014	77.6	94	57	66.5	SW	24	4384	14	12	5	3.9	6	0.91	0.39
August	29.994	77.2	96.3	53.5	59.4	E	38	5622	11	14	6	4.3	7	0.83	0.64
September	29.934	69.7	94	46	64.9	SW	36	6512	9	14	7	4.6	16	5.50	1.37
October	30.087	56.5	79	37	73.7	SE	28	5948	5	13	13	6.4	20	6.85	2.29
November	30.109	39.7	65	6	66.5	NW	28	7798	5	15	10	5.9	12	2.19	1.49
December	30.151	38.2	55	12	65.0	SW	36	6560	6	14	11	5.9	14	1.71	0.50
			Highest.	Lowest.			Highest.		Percentages.				Total.		
Annual means	30.031	50.4	96.3	—21	68.5	E	40	5965	24.38	44.93	30.69	5.5	161	37.28	1.04

*The sign minus (—) denotes below zero. (Barometer to sea-level.)

REMARKS.—The last frost of spring occurred May 3. The last snow of spring occurred April 12. The first frost of autumn occurred October 5. The first snow of autumn occurred November 11. The first ice of autumn occurred November 10. Freshet from October 10 to November 7. River commenced rising rapidly October 10; reached danger-line October 12; highest water October 25, 26, 27 (17 feet 8 inches); commenced falling October 28; below danger-line November 4; flood subsiding from November 7. Elevation above sea-level 615 feet.

ROBERT R. MARTIN, *Sergeant Signal Corps, U. S. A.*

[TABLE VI.] METEOROLOGICAL SUMMARY.

For the year ending October 31, 1881, Dubuque, Iowa.

Latitude, 42°, 30', Longitude, 90°, 44'.

MONTH.	Mean barometer.	Mean temperature.	Mean relative humidity.	Highest temperature.	Lowest temperature.	Prevailing direction of wind.	Maximum velocity.	Number of clear days.	Number of days.	Number of cloudy days.	Number of days on which rain or snow fell.	Total amount of rain or melted snow.
1880.												
November	30.162	27.8	69.1	60.0	- 5.0	SE	18	7	10	13	9	2.11
December	30.140	19.1	74.5	45.0	-19.0	W	23	6	6	19	14	1.25
1881.												
January	30.174	12.5	76.7	37.0	-24.5	NW	16	3	13	15	13	1.87
February	30.125	20.1	74.0	45.0	- 9.0	NW	20	3	11	14	13	3.70
March	29.924	30.4	71.1	52.0	- 5.0	NW	20	2	17	12	15	3.78
April	30.000	43.9	64.4	80.0	17.0	S	18	6	13	12	12	1.30
May	29.960	67.7	61.0	90.0	39.0	S	19	6	17	8	11	2.30
June	29.803	67.9	72.1	93.2	50.9	SE	18	4	15	11	14	7.56
July	29.997	75.2	70.5	93.2	57.2	NW	18	10	16	5	11	10.53
August	30.000	74.5	66.8	97.3	51.0	SE	22	10	15	6	11	2.46
September	29.923	66.3	70.7	94.2	42.5	S	18	6	17	7	17	10.26
October	30.081	53.2	75.7	80.0	35.5	S	16	4	11	16	18	6.79

Elevation above sea level, 695 feet.

JAMES HARVEY SMITH,
Sergeant Signal Corps, U. S. A.

[TABLE VII.] TEMPERATURE AND RAIN-FALL OF THE STATE FOR THE YEARS 1881 AND 1882.

1881.	Highest temperature.	Lowest temperature.	Mean temperature.	Rain-fall in inches.	1882.	Highest temperature.	Lowest temperature.	Mean temperature.	Rain-fall in inches.
January	38°	-24°	10.9°	1.33	January	54°	- 2°	22.6°	0.54
February	42	-11	18.4	2.73	February	67	1	34.6	1.16
March	46	3	28.4	2.09	March	66	10	36.1	2.13
April	81	14	43.6	1.42	April	81	24	48.9	4.47
May	88	40	68.2	1.77	May	81	33	53.2	7.19
June	93	48	69.4	12.55	June	87	43	67.6	9.51
July	96	56	76.7	4.73	July	88	52	69.3	2.27
August	98	54	76.5	0.68	August	89	50	71.4	2.91
September	95	42	68.2	6.51	September	89	38	63.3	1.58
October	81	32	53.6	6.66	October	82	31	55.2	4.65
November	62	4	33.7	3.29	November	66	13	37.0	1.54
December					December	47	18	20.6	2.15

Figures preceded by a (-) signify below zero.

Highest temperature for 1881, 103°, August 17th.
Highest temperature for 1882, 89°, August 23d, September 18th.
Lowest temperature for 1881, -19°, January 14th.
Lowest temperature for 1882, -1°, January 17th, 29th.
Mean temperature for 1881, 45.07°.
Mean temperature for 1882, 48.32°; which is 0.38° high.
Total rain-fall for 1881, in inches, 43.72.
Total rain-fall for 1882, in inches, 40.10, or three per cent above normal.

PROF. PARVIN'S OBSERVATIONS.

The following statistics are prepared from observations made by Prof. T. S. Parvin, at Muscatine, from 1839 to 1859, and at Iowa City from 1860 to 1874, and published in the Iowa Weather Service Report for 1878. They form an important place in the meteorological history of the State, and that they may be placed more permanently on record is the reason for giving them place here. The creation of the Iowa Weather Service will continue the subject, and as the years go on, the relation of meteorology to the diseases of the State can be more fully and satisfactorily studied.

[TABLE VIII.] JANUARY, 1839–1874.

YEAR.	TEMPERATURE.			RAIN-FALL.			WEATHER. NO. OF DAYS.				WIND—NO. DAYS.			
	Mean.	Lowest.	Highest.	Total.	Greatest.	Depth of snow.	Rain.	Snow.	Clear.	Cloudy.	N and NE	E and SE	S and SW	W and NW
1839...	**32.2**	0	60	.....	.....	.....	4	4	....	....	....	....	....	....
1840...	19.5	-17	39	.....	.....	.....	3	7	....	....	....	....	....	....
1841...	20.9	-23	52	.....	.....	.....	2	1	....	....	....	....	....	....
1842...	26.3	-10	52	.....	.....	.....	2	3	....	....	....	....	....	....
1843...	25.0	-15	50	.....	.....	.....	2	2	....	....	....	....	....	....
1844...	22.7	- 6	41	.....	.....	.....	7	5	....	....	....	....	....	....
1845...	30.0	6	58	.....	.....	.....	2	2	....	....	....	....	....	....
1846...	31.2	12	56	.....	.....	.....	1	4	....	....	....	....	....	....
1847...	12.3	-23	40	.....	.....	.....	0	5	....	....	....	....	....	....
1848...	28.0	- 8	50	1.20	.....	1.10	4	1	....	....	....	....	....	....
1849...	14.3	-24	46	2.82	.....	3.22	3	4	....	....	....	....	....	....
1850...	24.4	-10	46	**4.62**	.....	2.22	5	3	4	9	4	4	12	11
1851...	24.0	-16	46	1.55	.....	.50	1	1	**3**	5	3	2	8	18
1852...	19.6	-23	53	2.52	.....	3.20	3	5	6	7	7	2	8	14
1853...	27.1	- 9	54	.43	.....	1.00	2	2	11	**2**	7	5	7	10
1854...	16.2	-14	55	.40	.....	4.00	0	3	12	5	4	2	8	17
1855...	24.8	-23	**64**	1.68	.....	17.50	2	2	15	10	3	5	10	13
1856...	7.5	-26	32	**.12**	.....	12.20	0	4	10	7	3	6	6	16
1857...	**6.2**	**-30**	41	.61	.....	6.11	0	6	13	6	3	3	10	15
1858...	30.0	8	52	1.60	.....	.00	6	0	**19**	5	1	2	14	14
1859...	24.1	-13	50	.94	.....	.40	4	2	12	2	0	0	12	19
1860...	21.3	-26	48	1.17	.....	17.65	1	4	14	4	3	0	11	17
1861...	13 9	-18	39	.28	.....	18.05	1	5	11	10	4	4	8	15
1862...	13.5	-23	38	.29	.....	24.25	1	**14**	3	14	13	2	6	10
1863...	26.0	0	59	3.40	.....	2.92	**9**	3	7	10	8	4	12	7
1864...	15.9	-26	55	2.30	.....	3.15	3	2	12	7	5	3	11	12
1865...	20.5	-10	46	.30	.....	3.15	0	3	6	4	6	2	7	16
1866...	20.7	-14	47	4.19	.....	5.75	3	8	11	9	9	3	9	10
1867...	17.9	-18	45	1.28	.....	12.63	0	6	8	9	7	6	5	13
1868...	13.4	-16	50	.17	.....	1.12	2	4	10	6	8	4	4	15
1869...	26.0	-14	48	1.56	.....	6.30	3	3	9	**15**	6	4	11	10
1870...	22.1	- 5	45	2.30	.....	10.00	4	7	10	13	6	5	6	14
1871...	22.1	....	....	1.51	.....	15.10	....	....	....	....	....	....	....	....
1872...	16.9	....	....	.....	.....	.....	....	....	....	....	....	....	....	....
1873...	10.4	....	....	.....	.....	.....	....	....	....	....	....	....	....	....
1874...	.....	....	....	.....	.....	.....	....	....	....	....	....	....	....	....
1875...	.....	....	....	.....	.....	.....	....	....	....	....	....	....	....	....
Mean of years.	21.8	....	....	1.52	.....	.....	2.4	3.8	9.6	7.3	5.2	3.1	9.0	13.6
	1839–1870			1848–1869							1850–1870			

MAY, 1839–1874.

YEAR.	TEMPERATURE.			RAIN-FALL.			WEATHER. NO. OF DAYS.				WIND—NO. DAYS.			
	Mean.	Lowest.	Highest.	Total.	Greatest.	Depth of snow.	Rain.	Snow.	Clear.	Cloudy	N and NE	E and SE	S and SW	W and NW
1839..	**68.9**	38	84	.....	.....	.....	10	....	....	....	....	....	....	....
1840..	63.1	37	85	.....	.....	.....	13	....	....	....	....	....	....	....
1841..	58.1	33	**90**	.....	.....	.....	8	....	....	....	....	....	....	....
1842..	57.9	33	86	.....	.....	.....	6	....	....	....	....	....	....	....
1843..	58.2	27	88	.....	.....	.....	9	....	....	....	....	....	....	....
1844..	55.9	36	85	.....	.....	.....	9	....	....	....	....	....	....	....
1845..	55.5	34	82	.....	.....	.....	**3**	....	....	....	....	....	....	....
1846..	64.1	38	86	.....	.....	.....	9	....	....	....	....	....	....	....
1847..	55.8	30	87	.....	.....	.....	8	....	....	....	....	....	....	....
1848..	62.0	35	84	3.40	.....	.....	10	....	....	....	....	....	....	....
1849..	54.8	30	80	4.70	.....	.....	12	....	....	....	....	....	....	....
1850..	53.3	24	86	3.70	.....	.....	4	....	7	4	7	7	6	11
1851..	58.2	**22**	82	**12.60**	.....	.....	17	....	8	3	6	12	8	5
1852..	60.0	29	82	6.50	.....	.....	7	....	10	0	6	11	8	6
1853..	55.7	34	81	4.60	.....	.....	10	....	10	5	8	3	6	**12**
1854..	60.0	35	76	6.21	.....	.....	13	....	9	6	5	16	5	5
1855..	60.4	27	86	1.94	.....	.....	5	....	12	4	8	**17**	6	0
1856..	61.4	40	**90**	4.39	.....	.....	12	....	3	6	6	9	8	8
1857..	53.9	29	83	2.75	.....	.....	9	....	12	6	9	12	5	5
1858..	54.3	39	81	8.40	.....	.....	**21**	....	6	**9**	6	9	6	10
1859..	62.1	45	82	7.49	.....	.....	10	....	12	6	6	10	10	5
1860..	64.3	28	89	**1.42**	.....	.....	9	....	8	5	2	12	10	7
1861..	58.7	35	78	2.95	.....	.....	11	....	11	5	5	2	15	9
1862..	59.4	39	84	3.65	.....	.....	6	....	12	7	**14**	6	7	4
1863..	58.7	36	80	4.56	.....	.....	10	....	9	7	5	4	10	12
1864..	62.2	32	**90**	3.60	.....	.....	9	....	**15**	5	8	0	12	11
1865..	61.4	37	86	2.72	.....	.....	7	....	7	5	9	6	10	6
1866..	59.2	35	84	1.59	.....	.....	7	....	8	6	8	2	10	11
1867..	**51.9**	31	79	10.60	.....	.....	13	....	7	9	11	10	5	5
1868..	61.7	46	84	7.20	.....	.....	15	....	5	6	7	10	5	9
1869..	60.0	40	82	4.06	.....	.....	7	....	8	9	12	5	8	6
1870..	65.5	44	89	3.00	.....	.....	9	0	12	5	5	9	**13**	4
1871..	65.9	.....	.....	2.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1872..	58.6	.....	.....	7.82	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1873..	56.2	.....	.....	5.55	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1874..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1875..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Mean of years.	59.1	.....	.....	4.95	.....	.....	9.6	0.0	9.2	6.4	7.4	8.1	7.9	7.3
	1839–1870.			1848–1869.							1850–1870.			

JUNE, 1839–1874.

YEAR.	TEMPERATURE.			RAIN-FALL.			WEATHER. NO. OF DAYS.				WIND—NO. DAYS.			
	Mean.	Lowest.	Highest.	Total.	Greatest.	Depth of snow.	Rain.	Snow.	Clear.	Cloudy	N and NE	E and SE	S and SW	W and NW
1839..	70.6	48	86	.....	.....	.....	11	....	....	....	....	....	....	....
1840..	72.4	57	88	.....	.....	.....	13	....	....	....	....	....	....	....
1841..	71.1	49	96	.....	.....	.....	10	....	....	....	....	....	....	....
1842..	65.6	43	92	.....	.....	.....	8	....	....	....	....	....	....	....
1843..	67.8	40	90	.....	.....	.....	7	....	....	....	....	....	....	....
1844..	65.8	48	90	.....	.....	.....	15	....	....	....	....	....	....	....
1845..	64.3	54	88	.....	.....	.....	6	....	....	....	....	....	....	....
1846..	66.1	54	82	.....	.....	.....	7	....	....	....	....	....	....	....
1847..	**62.5**	40	86	.....	.....	.....	6	....	....	....	....	....	....	....
1848..	64.3	**33**	88	2.50	.....	.....	7	....	....	....	....	....	....	....
1849..	67.6	44	86	12.20	.....	.....	9	....	....	....	....	....	....	....
1850..	70.2	40	88	3.50	.....	.....	7	....	6	2	8	5	14	3
1851..	64.6	44	85	**14.30**	.....	.....	**21**	....	4	6	8	10	5	7
1852..	66.8	40	90	2.20	.....	.....	6	....	9	6	8	3	11	8
1853..	71.2	49	91	6.40	.....	.....	9	....	12	2	2	12	11	5
1854..	69.0	49	92	.66	.....	.....	2	....	7	1	5	11	9	5
1855..	67.0	35	91	4.75	.....	.....	10	....	8	4	3	6	15	6
1856..	71.8	50	97	2.86	.....	.....	4	....	10	2	5	8	12	5
1857..	65.1	38	89	.90	.....	.....	7	....	11	4	6	9	12	3
1858..	70.6	52	96	6.70	.....	.....	6	....	11	9	2	8	12	4
1859..	69.0	40	85	5.82	.....	.....	13	....	8	6	1	**14**	5	10
1860..	69.3	48	92	3.66	.....	.....	6	....	15	3	5	9	9	7
1861..	68.3	51	89	.40	.....	.....	**2**	....	12	3	4	6	11	9
1862..	71.8	42	89	6.07	.....	.....	4	....	13	8	4	7	13	6
1863..	62.5	42	93	**.21**	.....	.....	3	....	11	4	5	14	0	11
1864..	70.6	47	92	5.70	.....	.....	9	....	7	3	**12**	4	8	6
1865..	**74.9**	54	88	6.96	.....	.....	12	....	5	5	2	10	14	5
1866..	67.9	48	90	4.76	.....	.....	12	....	7	5	2	4	11	**13**
1867..	70.5	52	90	3.94	.....	.....	12	....	7	7	6	12	9	3
1868..	70.8	47	92	1.28	.....	.....	3	....	**15**	3	3	13	8	6
1869..	66.0	44	85	7.42	.....	.....	15	....	5	**40**	5	5	10	10
1870..	71.8	50	**99**	1.30	.....	.....	9	0	10	3	4	7	**18**	1
1871..	70.5	.....	.....	9.16	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1872..	70.5	.....	.....	7.39	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1873..	73.5	.....	.....	4.44	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1874..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1875..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Mean of years.	67.9	.....	.....	4.59	.....	.....	8.5	.0	9.2	4.2	4.8	8.6	10.1	6.6
	1839–1870.			1848–1869.							1850–1870.			

JULY—1839–1874.

YEAR.	TEMPERATURE.			RAIN-FALL.			WEATHER. NO. OF DAYS.				WIND—NO. DAYS.			
	Mean.	Lowest.	Highest.	Total.	Greatest.	Depth of snow.	Rain.	Snow.	Clear.	Cloudy	N and NE	E and SE	S and SW	W and NW
1839..	75.7	58	95	.....	.....	.....	6	....	....	....	....	....	....	....
1840..	73.9	58	87	.....	.....	.....	11	....	....	....	....	....	....	....
1841..	70.4	56	96	.....	.....	.....	10	....	....	....	....	....	....	....
1842..	68.4	50	94	.....	.....	.....	8	....	....	....	....	....	....	....
1843..	70.4	55	95	.....	.....	.....	6	....	....	....	....	....	....	....
1844..	74.9	56	94	.....	.....	.....	9	....	....	....	....	....	....	....
1845..	76.0	50	98	.....	.....	.....	8	....	....	....	....	....	....	....
1846..	73.0	44	94	.....	.....	.....	9	....	....	....	....	....	....	....
1847..	69.5	**42**	92	.....	.....	.....	5	....	....	....	....	....	....	....
1848..	**64.0**	48	85	5.70	.....	.....	14	....	....	....	....	....	....	....
1849..	66.5	42	89	1.40	.....	.....	5	....	....	....	....	....	....	....
1850..	74.2	50	94	5.00	.....	.....	9	....	7	0	2	5	20	4
1851..	71.6	44	97	**8.60**	.....	.....	**15**	....	12	4	7	6	13	5
1852..	72.4	45	94	3.70	.....	.....	6	....	14	1	10	6	11	4
1853..	68.8	46	87	6.60	.....	.....	11	....	11	3	6	8	8	9
1854..	76.2	46	98	2.22	.....	.....	10	....	9	4	4	6	13	8
1855..	73.0	55	95	2.35	.....	.....	8	....	10	3	9	9	10	3
1856..	73.5	55	93	2.74	.....	.....	9	....	15	2	3	10	9	9
1857..	71.2	45	97	4.67	.....	.....	4	....	**18**	3	6	7	13	5
1858..	78.8	52	89	7.30	.....	.....	15	....	6	**19**	6	11	9	5
1859..	72.3	46	97	2.93	.....	.....	7	....	12	4	5	6	14	6
1860..	71.7	50	94	4.03	.....	.....	11	....	10	1	1	10	10	**10**
1861..	69.0	47	97	2.70	.....	.....	3	....	11	5	6	**13**	7	5
1862..	73.4	56	95	3.10	.....	.....	4	....	15	5	2	13	12	4
1863..	71.5	49	94	.**80**	.....	.....	2	....	16	5	**18**	6	4	3
1864..	76.0	55	94	5.00	.....	.....	6	....	16	4	3	8	11	9
1865..	69.3	55	91	7.30	.....	.....	13	....	12	6	7	5	10	9
1866..	77.1	60	94	6.55	.....	.....	7	....	14	5	0	6	**20**	5
1867..	73.3	55	92	3.94	.....	.....	9	....	10	3	3	10	16	2
1868..	**80.8**	53	96	6.15	.....	.....	6	....	12	4	2	12	15	2
1869..	70.9	52	86	7.42	.....	.....	14	....	10	10	2	10	15	4
1870..	78.3	55	**100**	1.85	.....	.....	8	0	14	4	2	8	15	6
1871..	71.3	.....	.....	5.56	.....	.....	....	....	....	....	....	....	....	....
1872..	74.0	.....	.....	5.85	.....	.....	....	....	....	....	....	....	....	....
1873..	73.5	.....	.....	3.24	.....	.....	....	....	....	....	....	....	....	....
1874..	.....	.....	.....	.....	.....	.....	....	....	....	....	....	....	....	....
1875..	.....	.....	.....	.....	.....	.....	....	....	....	....	....	....	....	....
Mean of years.	72.5	.....	.....	4.68	.....	.....	8.5	.0	12.3	4.5	5.1	5.8	12.0	5.5
	1839–1870			1848–1869							1850–1870			

AUGUST, 1839–1874.

YEAR.	TEMPERATURE.			RAIN-FALL.			WEATHER. NO. OF DAYS.				WIND—NO. DAYS.			
	Mean.	Lowest.	Highest.	Total.	Greatest.	Depth of snow.	Rain.	Snow.	Clear.	Cloudy	N and NE	E and SE	S and SW	W and NW
1839..	73.1	49	92	.....	.....	.....	8	....	....	....	....	....	....	....
1840..	72.1	54	86	.....	.....	.....	11	....	....	....	....	....	....	....
1841..	65.5	48	96	.....	.....	.....	8	....	....	....	....	....	....	....
1842..	68.7	42	96	.....	.....	.....	3	....	....	....	....	....	....	....
1843..	70.6	46	94	.....	.....	.....	7	....	....	....	....	....	....	....
1844..	70.0	46	92	.....	.....	.....	7	....	....	....	....	....	....	....
1845..	70.8	48	93	.....	.....	.....	4	....	....	....	....	....	....	....
1846..	72.0	54	94	.....	.....	.....	5	....	....	....	....	....	....	....
1847..	65.3	42	86	.....	.....	.....	8	....	....	....	....	....	....	....
1848..	66.7	48	86	9.10	.....	.....	**15**	....	....	....	....	....	....	....
1849..	**65.3**	**36**	86	12.20	.....	.....	11	....	....	....	....	....	....	....
1850..	72.2	50	94	13.00	.....	.....	11	....	3	5	9	13	7	2
1851..	69.1	52	85	**14.00**	.....	.....	8	....	6	5	**20**	1	7	3
1852..	69.0	44	92	2.80	.....	.....	4	....	11	4	7	15	4	5
1853..	71.1	41	92	1.70	.....	.....	5	....	15	0	3	9	13	6
1854..	73.0	46	99	3.33	.....	.....	7	....	14	4	4	13	11	3
1855..	70.4	53	96	3.51	.....	.....	6	....	7	5	3	**14**	12	2
1856..	65.4	40	91	1.36	.....	.....	4	....	12	5	4	6	12	9
1857..	70.9	47	92	6.00	.....	.....	11	....	6	3	6	8	12	5
1858..	**79.9**	46	93	4.12	.....	.....	8	....	15	6	10	5	10	6
1859..	68.2	42	92	1.70	.....	.....	4	....	15	4	7	6	9	9
1860..	68.8	45	95	2.30	.....	.....	8	....	15	5	4	14	4	9
1861..	70.1	47	**99**	4.07	.....	.....	6	....	9	5	5	8	12	6
1862..	69.3	55	99	7.30	.....	.....	7	....	10	6	1	6	**20**	4
1863..	70.4	36	94	2.44	.....	.....	7	....	13	**7**	1	9	11	**10**
1864..	73.0	50	91	7.60	.....	.....	8	....	10	7	3	11	11	6
1865..	72.4	55	90	**1.35**	.....	.....	5	....	8	3	4	5	14	8
1866..	68.8	43	85	6.85	.....	.....	11	....	9	7	2	10	9	10
1867..	74.7	50	85	4.45	.....	.....	6	....	**16**	3	3	5	17	6
1868..	69.1	48	92	4.67	.....	.....	6	....	13	5	4	8	14	5
1869..	74.4	57	93	11.43	.....	.....	15	....	7	9	8	8	11	4
1870..	70.9	50	96	5.83	.....	.....	12	0	6	5	4	3	17	7
1871..	71.8	.....	.....	5.23	.....	.....	....	....	....	....	....	....	....	....
1872..	73.0	.....	.....	9.55	.....	.....	....	....	....	....	....	....	....	....
1873..	74.8	.....	.....	.65	.....	.....	....	....	....	....	....	....	....	....
1874..	.....	.....	.....	.....	.....	.....	....	....	....	....	....	....	....	....
1875..	.....	.....	.....	.....	.....	.....	....	....	....	....	....	....	....	....
Mean of years.	70.7	.....	.....	6.69	.....	.....	7.5	.0	10.7	4.7	5.4	8.7	11.0	5.9
	1839–1870			1848–1869							1850–1870			

SEPTEMBER, 1839–1874.

YEAR.	TEMPERATURE.			RAIN-FALL.			WEATHER. NO. OF DAYS.				WIND—NO. DAYS.			
	Mean.	Lowest.	Highest.	Total.	Greatest.	Depth of snow.	Rain.	Snow.	Clear.	Cloudy	N and NE.	E and SE.	S and SW.	W and NW
1839 ..	61.1	38	84	.....	.....	.....	5	....	....	....	....	....	....	....
1840 ..	63.1	44	76	.....	.....	.....	10	....	....	....	....	....	....	....
1841 ..	58.5	36	96	.....	.....	.....	10	....	....	....	....	....	....	....
1842 ..	64.5	35	92	.....	.....	.....	7	....	....	....	....	....	....	....
1843 ..	64.6	45	92	.....	.....	.....	11	....	....	....	....	....	....	....
1844 ..	61.4	33	93	.....	.....	.....	6	....	....	....	....	....	....	....
1845 ..	62.9	30	92	.....	.....	.....	8	....	....	....	....	....	....	....
1846 ..	65.9	42	92	.....	.....	.....	8	....	....	....	....	....	....	....
1847 ..	59.8	36	84	.....	.....	.....	2	....	....	....	....	....	....	....
1848 ..	56.3	33	84	3.00	.....	.....	4	....	....	....	....	....	....	....
1849 ..	61.7	37	84	5.00	.....	.....	5	....	....	....	....	....	....	....
1850 ..	59.8	30	84	3.90	.....	.....	9	....	5	2	8	7	7	8
1851 ..	68.3	30	91	3.50	.....	.....	6	....	10	7	11	8	8	3
1852 ..	59.8	35	84	8.30	.....	.....	8	....	17	7	10	9	5	6
1853 ..	62.2	37	88	6.20	.....	.....	7	....	13	6	7	10	8	5
1854 ..	68.2	37	96	1.13	.....	.....	8	....	12	5	6	10	10	4
1855 ..	67.9	35	92	1.84	.....	.....	13	....	4	9	6	10	9	3
1856 ..	59.0	28	91	2.45	.....	.....	3	....	13	5	1	6	12	11
1857 ..	63.8	36	88	1.80	.....	.....	8	....	10	5	5	12	10	3
1858 .	66.9	42	87	6.10	.....	.....	7	....	20	4	3	2	17	8
1859 ..	60.3	34	87	1.80	.....	.....	7	....	14	5	6	5	6	13
1860 ..	54.3	40	89	2.76	.....	.....	10	....	7	5	7	10	4	9
1861 ..	62.6	40	88	9.92	.....	.....	14	....	8	1	6	12	12	8
1862 ..	63.4	41	82	6.10	.....	.....	8	....	13	10	2	7	11	10
1863 ..	61.2	36	90	4.44	.....	.....	6	....	15	0	7	4	13	6
1864 ..	66.9	36	92	2.12	.....	.....	10	....	9	0	5	8	12	5
1865 ..	72.6	44	90	3.75	.....	.....	11	....	7	4	4	4	16	6
1866 ..	59.1	33	85	6.53	.....	.....	13	....	10	10	7	10	3	10
1867 ..	66.8	43	87	4.62	.....	.....	6	....	12	6	7	3	14	5
1868 ..	58.8	32	81	5.17	.....	.....	13	....	10	10	3	5	12	10
1869 ..	63.2	33	80	3.09	.....	.....	6	....	10	6	2	7	11	10
1870 ..	67.8	56	90	6.67	.....	.....	9	0	2	15	13	6	7	4
1871 ..	60.1	....	....	.00	.....	.....	....	....	....	....	....	....	....	....
1872 ..	62.9	....	....	6.29	.....	.....	....	....	....	....	....	....	....	....
1873 ..	61.1	....	....	2.97	.....	.....	....	....	....	....	....	....	....	....
1874 ..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1875 ..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Mean of years.	63.4	....	....	4.25	.....	.....	7.9	.0	10.7	6.6	5.7	6.9	10.0	.7.2
	1839–1870.			1848–1869.							1850–1870.			

OCTOBER, 1839–1874.

YEAR.	TEMPERATURE.			RAIN-FALL.			WEATHER. NO. OF DAYS.				WIND—NO. DAYS.			
	Mean.	Lowest.	Highest.	Total.	Greatest.	Depth of snow.	Rain.	Snow.	Clear.	Cloudy	N and NE	E and SE	S and SW	W and NW
1839 ..	60.7	31	80	.....	.....	.....	14	0	....	....	....	....	....	....
1840 ..	52.6	25	77	.....	.....	.....	5	0	....	....	....	....	....	....
1841 ..	55.0	18	72	.....	.....	.....	7	1	....	....	....	....	....	....
1842 ..	55.5	23	80	.....	.....	.....	2	0	....	....	....	....	....	....
1843 ..	42.2	12	84	.....	.....	.....	3	4	....	....	....	....	....	....
1844 ..	46.1	16	74	.....	.....	.....	5	1	....	....	....	....	....	....
1845 ..	48.5	16	71	.....	.....	.....	3	0	....	....	....	....	....	....
1846 ..	43.0	16	80	.....	.....	.....	6	3	....	....	....	....	....	....
1847 ..	47.8	8	86	.....	.....	.....	6	1	....	....	....	....	....	....
1848 ..	43.9	27	72	4.30	.....	.....	9	0	....	....	....	....	....	....
1849 ..	49.0	28	70	4.80	.....	.....	5	0	....	....	....	....	....	....
1850 ..	44.2	22	80	2.70	.....	.....	4	0	6	2	9	3	7	12
1851 ..	50.4	18	70	1.40	.....	.....	7	0	12	7	9	4	8	10
1852 ..	53.2	30	76	7.60	.....	.....	9	0	7	11	8	5	8	10
1853 ..	45.5	10	76	.21	.....	.....	1	1	14	4	3	10	7	11
1854 ..	44.4	27	82	4.22	.....	.....	11	0	9	5	3	13	6	9
1855 ..	47.2	15	84	2.86	.....	.....	6	1	9	9	6	5	12	8
1856 ..	52.4	25	82	5.21	.....	.....	7	0	8	8	3	13	10	5
1857 ..	47.9	22	74	1.95	.....	.....	7	0	12	8	5	11	8	7
1858 ..	52.0	30	85	4.90	.....	.....	13	0	9	14	2	9	11	9
1859 ..	37.5	15	82	.85	.....	.....	4	1	19	5	5	5	7	14
1860 ..	61.3	24	87	1.00	.....	.....	4	0	12	4	7	8	9	7
1861 ..	50.1	28	74	9.16	.....	.....	6	0	13	8	13	11	3	4
1862 ..	48.6	17	86	2.49	.....	.....	8	0	15	6	4	4	13	10
1863 ..	40.0	18	66	4.10	.....	.....	8	2	5	10	5	2	9	15
1864 ..	47.8	26	68	4.55	.....	.....	9	1	8	11	9	2	7	13
1865 ..	53.9	30	82	6.35	.....	.....	11	3	9	12	9	3	8	11
1866 ..	53.1	20	82	4.61	.....	.....	8	0	11	5	4	11	4	12
1867 ..	54.5	32	80	3.06	.....	.....	5	1	12	6	6	6	9	10
1868 ..	49.8	30	73	.33	.....	.....	3	0	10	8	8	7	6	10
1869 ..	42.7	16	78	2.07	.....	.....	2	0	14	3	....	....	....	....
1870 ..	53.2	25	75	3.16	.....	.....	8	0	7	8	6	3	10	12
1871 ..	52.8	....	....	5.51	.....	.....	....	....	....	....	....	....	....	....
1872 ..	48.1	....	....	.80	.....	.....	....	....	....	....	....	....	....	....
1873 ..	44.9	....	....	2.96	.....	.....	....	....	....	....	....	....	....	....
1874 ..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1875 ..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Mean of years.	49.6	....	....	3.65	.....	.....	6.0	0.5	10.5	7.5	6.2	6.9	8.0	9.8
	1839–1870.			1848–1869.							1850–1870.			

NOVEMBER, 1839-1874.

YEAR.	TEMPERATURE.			RAIN-FALL.			WEATHER. NO. OF DAYS.				WIND—NO. DAYS.			
	Mean.	Lowest.	Highest.	Total.	Greatest.	Depth of snow.	Rain.	Snow.	Clear.	Cloudy.	N and NE	E and SE	S and SW	W and NW
1839 ..	35.1	- 2	60	.....	.....	.....	3	2	....	....	....	....	....	....
1840 ..	41.9	19	66	.....	.....	.....	2	1	....	....	....	....	....	....
1841 ..	38.2	- 4	66	.....	.....	.....	5	4	....	....	....	....	....	....
1842 ..	30.2	-11	69	.....	.....	.....	3	7	....	....	....	....	....	....
1843 ..	34.1	10	56	.....	.....	.....	3	6	....	....	....	....	....	....
1844 ..	36.1	7	63	.....	.....	.....	4	2	....	....	....	....	....	....
1845 ..	33.3	**-17**	60	.....	.....	.....	1	2	....	....	....	....	....	....
1846 ..	39.1	2	62	.....	.....	.....	5	2	....	....	....	....	....	....
1847 ..	33.5	7	74	.....	.....	.....	6	4	....	....	....	....	....	....
1848 ..	30.8	5	50	1.40	.....	3.51	1	7	....	....	....	....	....	....
1849 ..	42.9	20	72	**6.60**	.....	.00	7	0	....	....	....	....	....	....
1850 ..	37.6	16	66	3.59	.....	.92	8	2	5	6	**8**	3	**10**	9
1851 ..	34.5	14	51	3.63	.....	1.30	3	6	3	9	4	6	8	12
1852 ..	30.0	7	50	5.76	.....	**30.00**	3	6	1	**19**	7	4	8	11
1853 ..	39.7	15	60	4.92	.....	8.00	6	3	5	9	9	4	9	8
1854 ..	36.8	7	69	.19	.....	1.00	3	2	10	2	1	1	8	**20**
1855 ..	37.8	10	67	2.18	.....	1.50	9	2	8	9	4	11	5	10
1856 ..	32.8	4	54	4.35	.....	5.20	10	2	6	11	3	6	7	14
1857 ..	31.2	0	60	4.77	.....	8.50	10	3	8	7	5	7	7	11
1858 ..	32.6	4	52	4.54	.....	5.40	**11**	**8**	4	19	**11**	2	3	14
1859 ..	39.6	12	**75**	1.53	.....	2.00	9	1	10	7	5	8	9	8
1860 ..	35.7	- 4	69	2.09	.....	6.00	2	4	8	4	3	8	5	14
1861 ..	37.0	5	65	2.93	.....	3.30	4	4	4	11	5	3	5	17
1862 ..	35.2	-15	64	3.29	.....	5.30	2	5	9	7	10	1	4	15
1863 ..	33.8	- 8	61	4.11	.....	2.40	5	3	8	5	7	2	5	16
1864 ..	**45.8**	0	59	4.82	.....	2.10	8	2	7	6	4	6	10	10
1865 ..	42.6	20	66	.25	.....	.00	2	0	**16**	3	3	**12**	8	7
1866 ..	40.2	-16	72	1.41	.....	1.00	3	1	6	9	7	9	6	8
1867 ..	31.6	0	72	1.97	.....	.13	3	1	12	5	5	5	10	10
1868 ..	38.0	18	63	4.38	.....	1.10	6	3	10	15	3	3	8	16
1869 ..	32.1	5	70	3.42	.....	10.66	4	8	6	9	.....	.....	.....	.....
1870 ..	39.3	20	66	.94	.....	.....	4	2	11	5	5	3	11	11
1871 ..	29.0	.....	.....	3.77	.....	2.25	.....	.....	.....	.....	.....	.....	.....	.....
1872 ..	**27.3**	.....	.....	1.21	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1873 ..	31.4	.....	.....	.82	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1874 ..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1875 ..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Mean of years.	36.3	.....	.....	3.27	.....	4.73	4.9	3.1	7.3	8.8	5.4	5.7	7.1	12.2
	1839-1870.			1848-1869.							1850-1870.			

DECEMBER, 1839-1874.

YEAR.	TEMPERATURE.			RAIN-FALL.			WEATHER. NO. OF DAYS.				WIND—NO. DAYS.			
	Mean.	Lowest.	Highest.	Total.	Greatest.	Depth of snow.	Rain.	Snow.	Clear.	Cloudy	N and NE	E and SE	S and SW	W and NW
1839 ..	23.9	-5	48	.....	.....	.....	2	9	....	....	....	....	....	....
1840 ..	29.6	-2	55	.....	.....	.....	0	1	....	....	....	....	....	....
1841 ..	28.8	-8	47	.....	.....	.....	5	3	....	....	....	....	....	....
1842 ..	21.6	-21	48	.....	.....	.....	1	5	....	....	....	....	....	....
1843 ..	31.9	8	44	.....	.....	.....	5	1	....	....	....	....	....	....
1844 ..	25.4	-6	38	.....	.....	.....	2	2	....	....	....	....	....	....
1845 ..	18.2	12	42	.....	.....	.....	1	5	....	....	....	....	....	....
1846 ..	28.9	6	54	.....	.....	.....	4	4	....	....	....	....	....	....
1847 ..	25.4	-10	63	.....	.....	.....	2	3	....	....	....	....	....	....
1848 ..	19.1	-6	44	1.29	.....	29.52	1	6	....	....	....	....	....	....
1849 ..	18.4	-12	44	1.14	.....	4.75	2	7	....	....	....	....	....	....
1850 ..	19.8	-6	44	2.87	.....	3.71	2	3	1	7	12	2	5	12
1851 ..	21.4	-18	56	2.95	.....	1.50	5	4	6	8	7	3	3	18
1852 ..	22.2	0	52	5.11	.....	11.40	3	7	0	18	1	8	9	13
1853 ..	26.7	-1	48	.32	.....	38.20	0	3	11	7	4	4	10	13
1854 ..	27.8	-4	50	.51	.....	1.00	2	2	13	6	4	4	8	15
1855 ..	21.7	-19	60	2.15	.....	13.00	6	5	7	9	4	5	8	14
1856 ..	15.6	-13	42	6.25	.....	19.00	8	5	6	11	7	6	2	16
1857 ..	31.4	-13	52	1.85	.....	3.50	7	2	12	9	4	5	13	9
1858 ..	25.5	15	48	1.82	.....	12.01	5	3	14	10	2	1	18	10
1859 ..	15.1	-22	46	1.81	.....	8.10	3	6	14	8	5	4	8	14
1860 ..	17.5	-22	43	4.02	.....	28.00	1	7	10	5	9	2	3	17
1861 ..	26.0	-5	62	2.87	.....	6.25	3	3	10	8	6	0	14	11
1862 ..	29.3	-3	52	2.75	.....	.10	6	2	12	12	8	4	7	12
1863 ..	27.0	-23	53	3.55	.....	.25	2	6	5	5	7	9	7	8
1864 ..	19.3	-14	54	1.60	.....	4.25	4	7	7	8	2	8	7	14
1865 ..	21.0	-17	50	.33	.....	2.11	1	5	16	5	10	5	3	13
1866 ..	23.6	-2	53	2.34	.....	12.00	4	4	12	8	9	8	4	14
1867 ..	24.3	-2	42	.73	.....	6.10	1	5	7	10	4	8	9	10
1868 ..	21.7	-18	50	.81	.....	8.99	1	8	9	9	8	5	7	11
1869 ..	25.5	-2	....	2.40	.....	5.90	.....	.....	.....	.....	.....	.....	.....	.....
1870 ..	24.4	-11	54	.25	.....	.....	1	4	12	10	9	4	4	14
1871 ..	15.6	.....	.....	2.13	.....	14.65	.....	.....	.....	.....	.....	.....	.....	.....
1872 ..	12.6	.....	.....	.71	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1873 ..	25.1	.....	.....	4.22	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1874 ..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1875 ..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Mean of years.	23.6	.....	.....	2.34	.....	9.21	2.6	4.4	9.0	9.1	5.9	4.7	7.6	12.9
	1839-1870.			1848-1869.							1850-1870.			

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.

[TABLE IX.]

MONTHS.	RAIN-FALL IN INCHES.				MEAN TEMPERATURE, DEGREES F.			
	I	II	III	Month.	I	II	III	Month.
January	18.7	19.1	20.3	19.4	.52	.60	.60	1.72
February	22.0	24.4	27.1	24.4	.55	.55	.70	1.80
March	29.6	32.2	37.3	33.1	.80	.95	1.10	2.85
April	43.3	47.9	51.6	47.6	1.20	1.20	1.10	3.50
May	55.5	60.0	63.8	59.9	1.20	1.20	1.35	3.75
June	66.3	68.8	71.8	69.0	1.65	1.65	1.55	4.85
July	73.7	74.1	73.8	73.9	1.65	1.27	1.20	4.12
August	73.1	71.8	69.6	71.2	1.42	1.65	1.85	4.92
September	66.4	62.9	59.4	62.9	1.80	1.55	1.25	4.60
October	55.0	50.3	45.1	49.9	1.10	.95	.90	2.95
November	40.7	35.8	29.2	35.3	.95	.82	.70	2.47
December	26.3	23.2	20.2	23.1	.60	.50	.50	1.60
The year—mean				47.47			Total	39.13

NORMAL MEAN TEMPERATURE FOR EACH DAY OF THE YEAR.

The following table gives the normal mean temperature for every odd day of the year, determined by Prof. Hinrichs from twenty years observation, made at Iowa City. The values for the mean days are obtainable by interpolation at sight. Thus: January 16, has a normal mean temperature of 19.1 degrees:

[TABLE X.]

DATE.	Jan.	Feb.	Mar.	April	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	19.2	21.2	28.7	40.7	54.0	65.3	73.0	72.8	67.8	56.8	42.2	27.4
3	18.9	21.6	29.1	42.0	54.8	65.9	73.3	72.7	67.1	55.9	41.3	26.8
5	18.7	22.0	29.6	43.2	55.5	66.3	73.6	72.6	66.4	55.0	40.4	26.3
7	18.6	22.5	30.1	44.3	56.3	66.8	73.9	72.5	65.7	54.0	39.6	25.7
9	18.7	22.9	30.5	45.4	57.3	67.3	74.0	72.4	65.0	53.1	38.7	25.0
11	18.8	23.3	31.0	46.3	58.2	67.8	74.1	72.2	64.3	52.1	37.7	24.4
13	18.9	23.8	31.5	47.1	59.1	68.3	74.1	72.0	63.7	51.2	36.7	23.8
15	19.0	24.4	32.2	47.9	59.9	68.8	74.1	71.8	62.9	50.2	35.7	23.2
17	19.2	24.9	33.0	48.6	60.7	69.4	74.0	71.5	62.2	49.2	34.7	22.5
19	19.5	25.4	33.9	49.3	61.4	69.9	73.9	71.1	61.5	48.2	33.5	21.9
21	19.8	25.9	34.9	50.1	62.2	70.6	73.7	70.5	60.7	47.2	32.0	21.2
23	20.0	26.5	36.0	50.8	62.5	71.1	73.5	70.1	60.0	46.2	30.5	20.6
25	20.3	27.1	37.1	51.6	63.2	71.8	73.2	69.5	59.3	45.1	29.4	20.1
27	20.6	27.6	38.3	52.3	64.3	72.2	73.1	69.0	58.5	44.1	28.6	19.8
29	20.8	28.2	39.6	53.1	64.8	72.6	73.0	68.4	57.6	43.2	27.9	19.4

FINANCIAL STATEMENT.

The following is a statement of expenditures of the State Board of Health, from the thirtieth day of September, 1881, to thirtieth day of June, 1883. Showing for what purposes, to whom paid, and the number of the vouchers on which the same was paid. The vouchers were audited by the State Board and the President, in accordance with sections ten and twelve, chapter 151, Laws of the Eighteenth General Assembly, and duplicates of all vouchers, on which warrants have been drawn on the State Treasurer, have been filed with the State Auditor, properly certified, as expenses of the State Board of Health.

SALARY OF SECRETARY AND CONTINGENT EXPENSES.

DATE.	No. of voucher.	TO WHOM PAID.	AMOUNT.
October 5	99	*L. F. Andrews.*	
		Salary for month ending October 5	$ 83.33
September 29	100	*Carter & Hussey.*	
		200 Form 10C	1.50
		1000 Form 4C	24.50
September 3	101	*U. S. Express Co.*	
		Package transportation	3.20
August 6	102	*American Express.*	
		Package transportation	3.00
September 26	103	*W. T. Heywood.*	
		Cash box	2.00
September 14	104	*Carver & Young.*	
		Draughting board	1.25
September 30	105	*Comparet & Stark.*	
		Covered dust-pan	.40
September 29	106	*R. N. Hyde.*	
		Cleaning room	.75
September 30	107	*Al. Grefe.*	
		Counter brush	.35
September 29	108	*W. H. Dickinson.*	
		Expenses to Albert Lea, Sanitary Convention	23.95
November 5	109	*R. J. Farquharson.*	
		Salary three months	300.00
November 5	110	*L. F. Andrews.*	
		Salary, month ending November 5	83.33
October 29	111	*Carter & Hussey.*	
		100 circulars	1.50
		Binding National Board of Health Bulletin	1.00
		100 9-in. envelopes, Form 12A	1.50
		240 Form 7E	15.00
		600 blanks, Iowa counties, 3 forms	15.00
October 31	112	*Iowa State Register.*	
		1000 Form 1C	11.00
		10 copies Daily Register	.30
October 30	113	*Redhead, Wellslager & Co.*	
		1 quart mucilage	1.25
		4 sheets gold paper	.20
		1 dozen scratch books	1.70
		½ dozen thumb tacks	.25
		1 ream 12-pound fools cap	3.60
		½ dozen scratch books	1.20
		¼ dozen scratch books	.75
		1 gross pens	1.00
October 3	114	*Thos. E. Pope.*	
		Analysis of water	6.15
October 20	115	*Wm. Grefe.*	
		Ice thirteen weeks	4.80
October 4	116	*Iowa State Leader.*	
		50 copies Daily Leader	2.00
October 28	117	*S. Van Cleve.*	
		1 glass bottle and packing	.70

FINANCIAL STATEMENT—CONTINUED.

DATE.	No. of voucher.	TO WHOM PAID.	AMOUNT.
October 25	118	*American Express.* Package transportation	$ 1.35
October 22	119	*U. S. Express.* Package transportation	1.35
October 19	120	*Walter Edwards.* Care of room one month	2.00
August 30	121	*W. S. Robertson.* Expenses to Albert Lea, Sanitary Council	19.40
November 21	122	*Post-Office.* 1,000 three-cent stamps	30.00
December 5	123	*L. F. Andrews.* Salary, month ending December 5	83.33
November 30	124	*Carter & Hussey.* 200 Notice to Clerks of District Court	5.00
		Binding National Board of Health Bulletin	1.00
		One French ruler, metric	2.00
		1,000 Form 27B	4.50
		125 Form 1D	.50
October 14	125	*U. S. Engraving Co.* Three printing cuts	14.55
December 1	126	*Redhead, Wellslager & Co.* One gross pens	1.50
		One Webster's quarto dictionary	10.00
		One half gross hexagon pencils	3.50
		One-third quire record	.75
November 4	127	*Comparet & Stark.* Rental of stove	10.00
November 4	128	*Sanitary Engineer.* One year's subscription	3.00
November 1	129	*Pioneer Coal Co.* 500 pounds Lehigh nut coal	2.75
November 1	130	*Western Telephone Co.* Rent of telephone one month	2.75
November 19	131	*R. J. Farquharson.* Postage overdue paid	2.00
November 16	132	*Walter Edwards.* Care of room one month	2.00
November 3	133	*J. M. Smith.* Electric alarm telephone bell	7.00
November 8	134	*Chicago & Northwestern R. R. Co.* Freight, one can of oil	.25
December 1	135	*Post-Office.* 500 4½ envelopes, stamped	16.20
December 12	136	*R. J. Farquharson.* Expense to Am. Pub. Health Association, Savannah	82.10
January 5	137	*L. F. Andrews.* Salary for month ending January 5	78.33
December 30	138	*Mills & Co.* 2,000 Form 2C	18.00
		1,000 Form 26E	10.00
		2,000 Form 21B	21.00
		One quire red express wrapping paper	.75

FINANCIAL STATEMENT—CONTINUED.

DATE.	No. of voucher.	TO WHOM PAID.	AMOUNT.
December 31	139	*W. Otto Gronen.* Drawings of Small-pox Hospital	$ 5.00
December 4	140	*U. S. Express Co.* Package transportation	3.65
December 1	141	*Western Telephone Co.* Rent of phone one month	3.00
January 2	142	*Redhead, Wellslager & Co.* 1 dictionary holder	2.00
		2 pints ink	.80
December 16	143	*Walter Edwards.* Care room one month	2.00
December 29	144	*Carter & Hussey.* 450 envelopes	1.00
February 5	145	*R. J. Farquharson.* Salary three months	300.00
February 5	146	*L. F. Andrews.* Salary one month	83.33
January 13	147	*A. N. Bell.* 1 year's subscription to Sanitarian	3.00
		9 bound volumes of Sanitarian	36.00
January 18	148	*U. S. Engraving Co.* 2 cuts	10.00
January 31	149	*L. Harbach.* Chair cushion	2.50
		Book case	7.00
January 23	150	*Samuel C. Dunham.* Stenographic report State sanitary convention	5.00
January 26	151	*H. Monroe.* Rent of hall for sanitary convention	3.00
February 5	152	*Western Telephone Co.* Rent of phone one month	3.00
February 5	153	*Walter Edwards.* Care of room one month	2.00
January 30	154	*Carter & Hussey.* 250 form 8E	2.00
January 31	155	*Post-office.* One year's subscription Postal Guide	1.50
January 18	156	*U. S. Express Co.* Package transportation	.80
February 13	157	*W. H. Dickinson.* Expenses to Savannah, Am. Pub. H. Assoc.	87.50
March 5	158	*L. F. Andrews.* Salary one month	83.33
February 23	159	*Post-office.* 200 10c stamps	20.00
		100 5c stamps	5.00
		500 3c stamped envelopes	16.30
		1,000 wrappers, 1c	11.20
February 1	160	*Western Telephone Co.* Rent of phone one month	3.00
March 16	161	*Capital City Gas Co.* 200 cubic feet of gas	.60

FINANCIAL STATEMENT—CONTINUED.

DATE.	No. of voucher.	TO WHOM PAID.	AMOUNT.
January 16	162	*Comparet & Stark.* Tack hammer and claw	$ .80
February 28	163	*Mills & Abdill.* Sponge cup and sponge	.45
March 5	164	*Walter Edwards.* Care of room one month	2.00
April 5	165	*Post-Office.* 2000 10 cent stamps	200.00
		500 postal cards	5.00
April 5	166	*L. F. Andrews.* Salary one month	83.33
March 29	167	*Carter & Hussey.* 150 Form 8C	4.00
		150 Form 17B	2.00
		480 wrappers	1.50
		Binding one volume Sanitary Engineer	1.25
		20000 certificates of deaths and births	50.00
		2000 wrappers	4.00
		150 note circulars	2.00
March 23	168	*Rollins & Langan.* 145 lbs. manilla paper, @ 9¼ cents	14.13
		3 lbs. flax twine, @ 25 cents	.75
March 8	169	*Mills & Co.* 1 ream letter heads, lithograph	8.00
December 5	170	*Am. Express Co.* Package transportation	5.85
March 2	171	*American Public Health Association.* Volume 6 Transactions of Association	5.00
March 1	172	*Western Telephone Co.* Rent of phone one month	3.00
April 5	173	*Walter Edwards.* Care of room one month	2.00
March 3	174	*U. S. Express Co.* Package transportation	1.40
May 5	175	*R. J. Farquharson.* Salary as Secretary three months	300.00
May 5	176	*L. F. Andrews.* Salary one month	83.33
April 1	177	*R. J. Farquharson.* Expenses to Sanitary Council at Cairo	54.55
April 1	178	*Western Telephone Co.* Rent of phone three months	9.00
April 1	179	Patent extension bell	7.00
April 21	180	*C. H. Atkins.* Book shelves	4.20
April 13	181	*Comparet & Stark.* Step-ladder	2.50
April 6	182	*U. S. Express Co.* Package transportation	1.50
May 5	183	*Walter Edwards.* Care of room one month	2.00
May 2	184	*R. J. Farquharson.* Expenses to board meeting at Muscatine	20.00

FINANCIAL STATEMENT—CONTINUED.

DATE.	No. of voucher.	TO WHOM PAID.	AMOUNT.
June 5	185	*L. F. Andrews.* Salary one month	$ 91.67
May 29	186	*Mills & Co.* 2,000 circulars, Form 21B, 16 pages	21.00
		2,000 circulars, Form 32B, 16 pages	29.00
		1,600 lithograph letter-heads	13.00
May 22	187	*R. J. Farquharson.* Expenses to Sanitary Conference at Port Huron	62.85
May 29	188	*Redhead, Wellslager & Co.* Pencil sharpener	.15
		2 yards egg-shell paper	1.40
		Crayon	.05
		Letter clip	.50
		½ dozen scratch-books	1.00
		1 dozen 4030 scratch-books	2.50
		3 red and green pencils	.45
		1 library index	1.50
April 25	189	*Iowa State Register.* Printing 100 postal cards	1.00
		Advertising in daily	.60
		1,000 receipts for reports	2.75
April 15	190	*Am. Express.* Package transportation	2.80
April 28	191	*C. H. Atkins.* Book shelves	3.05
June 5	192	*Walter Edwards.* Care of room one month	2.00
June 5	193	*L. F. Andrews.* Salary one month	91.67
June 23	194	*A. E. Foote.* Catalogue Library Pennsylvania hospital	1.25
		Cholera in 1873	.50
		McClelland's Civil Malpractice	.50
		Waring's Sanitary Drainage	2.00
		Parke's Practical Hygiene	4.50
		Philbrick's Sanitary Engineering	2.00
		Tidy on London Water	1.00
		Nichol's on Filtration of Water	1.50
		Gisler on Croton Water	.35
		Annual Scientific Discoveries, 1850 to 1871	12.50
		Record of Scientific Discoveries, 1870 to 1876	4.50
		Pattisier's Maladies des Artisans	1.00
		Marlor on Coal Mines	1.50
		Raymond's Hygiene of Mines	.35
July 1	195	*R. J. Farquharson.* Richardson's Diseases of Modern Life	1.50
		Frankland's Water Analysis	.60
		Van Benden, on Animal Parasites and Messmates	1.50
		Smith on Foods	1.50
		Walton Mineral Springs of the U. S	.60
		Bible Hygiene	.50
		Fox on Air, Water and Food	3.00

FINANCIAL STATEMENT—CONTINUED.

DATE.	No. of voucher.	TO WHOM PAID.	AMOUNT.
July 1	195	*R. J. Farquharson.*	
		McDonald's Microscopic Examination of Water	$ 2.10
		Woodworth's Nomenclature of Diseases	.40
		Burdett's Cottage Hospitals	2.50
		Maculloch on Malaria	1.00
		Spencer's Entozoa of Man and Animals	4.00
		Drake on Diseases of Mississippi Valley	3.00
		Reyburn on Diseases of Iowa	1.50
		De Chaumont's Lectures on State Medicine	4.25
June 20	196	*Comparet & Stark.*	
		Ice knife	.50
		Water filter	12.00
June 27	197	*Mills & Co.*	
		Wall map	3.00
		1,000, Form 26B	10.00
June 29	198	*Carter & Hussey.*	
		400 postal cards, printing	1.25
		Binding 1 volume Sanitary Engineer	1.50
		150 note circulars	2.25
		Printing 250 envelopes, Form 3A	1.00
		100, Form 1D	.75
June 28	199	*U. S. Express Co.*	
		Package transportation	4.60
July 1	200	*Walter Edwards.*	
		Janitor one month	2.00
June 26	201	*Post-Office.*	
		100 postal cards	1.00
June 26	202	*R. N. Hyde.*	
		Cleaning office	1.00
May 27	203	*American Express Co.*	
		Package transportation	.65
March 31	204	*Capital City Gas Co.*	
		200 cubic feet gas	.60
August 5	205	*R. J. Farquharson.*	
		Salary three months, secretary	300.00
July 31	206	*Carter & Hussey.*	
		100 envelopes, Form 13A	1.25
		200 envelopes, Form 1A	1.25
		150 circulars, Form 11B	3.50
		500 labels	2.00
		Binding 11 books, births @ $3.75	41.25
		Binding 6 books, deaths @ $3.75	22.50
		½ ream 10lb letter heads	1.25
		75 paste-board rolls	5.00
		Printing 300 envelopes	1.00
		250, Form 23B, circulars	3.75
		1 Blotting pad	.75
		1,000 circulars, Form 33B	3.00
		200 circulars, Form 34B	1.50
		500 blanks, Form 5C	19.00
		Binding 7 books, marriages @ $3.75	26.25
		Binding 1 book, still-births	3.75
		1,000 envelopes, Form 6A	3.50
		1,000 envelopes, Form 7A	3.50
		500 blanks, Form 6C	19.00
		1,500 blanks, Form 4C	16.00

FINANCIAL STATEMENT—CONTINUED.

DATE.	No. of voucher.	TO WHOM PAID.	AMOUNT.
August 5	207	*L. F. Andrews.*	
		Salary one month	$ 91.67
July 28	208	*A. E. Foote.*	
		Wood & Bache's U. S. Dispensatory	7.00
		U. S. Army Statistics	4.00
		Ekin on Potable Water	.60
		Lethby on Foods	1.50
		Morse on Health Matters in Japan	.20
		Pettenkoffer on Influence of Plants	.15
July 3	209	*J. & J. H. Green.*	
		1 5-inch Aneroid Barometer	13.25
July 1	210	*Western Telephone Co.*	
		Rent of phone three months	9.00
July 17	211	*American Express Co.*	
		Package transportation	2.65
July 17	212	*U. S. Express Co.*	
		Package transportation	2.15
July 1	213	*L. Harbach.*	
		Repairing chair	1.75
August 1	214	*Walter Edwards.*	
		Janitor one month	2.00
September 5	215	*L. F. Andrews.*	
		Salary one month	91.67
August 28	216	*Mills & Co.*	
		150 blanks	1.50
		1 rubber stamp	1.00
		1 rubber stamp	1.00
		1 blotting pad	.40
		1 bottle stamp ink	.25
		69 lithograph maps	7.35
		17 lithograph maps	2.55
August 30	217	*Carter & Hussey.*	
		1,500 blanks, Form 13E	16.00
		1 gross pens	1.50
August 30	218	*Rossall & Gibson.*	
		1 Andrea's Atlas of Iowa	5.00
August 21	219	*U. S. Express Co.*	
		Package transportation	5.70
September 1	220	*Redhead, Wellslager & Co.*	
		3 pounds hemp twine, 35 cents	1.05
		2 boxes McGill's fasteners	1.00
		1 dozen scratch books, 4030	2.25
		1 dozen Dixon's pencils	.60
August 8	221	*J. P. Bushnell.*	
		1 City Directory	3.00
September 1	222	*Walter Edwards.*	
		Janitor one month	2.00
July 8	223	*U. S. Express Co.*	
		Package transportion	1.10
October 5	224	*L. F. Andrews.*	
		Salary one month	91.67
September 16	225	*Mills & Co.*	
		1½ reams lithograph letter-heads	12.00

FINANCIAL STATEMENT—CONTINUED.

DATE.	No. of voucher.	TO WHOM PAID.	AMOUNT.
September 1	226	*Redhead, Wellslager & Co.*	
		One hektograph	$ 6.40
		Hektograph ink	.25
		2 sheets double elephant drawing paper	.70
		1 dozen scratch books, 4026	1.00
		2 quarts mucilage	1.00
		1 quart Universal ink	.75
		½ ream S. C. note paper	.65
		1 Dove pencil-holder	.15
		1 dozen thumb-tacks	.50
September 27	227	*Carter & Hussey.*	
		1 T-square	1.00
		1,000 library tickets	2.25
		Folding and interleaving blanks	2.00
		1,000 circulars, Form 8B	5.00
September 26	228	*R. L. Polk.*	
		1 Iowa State Directory	5.00
October 1	229	*Frank Davison.*	
		Janitor one month	2.00
August 2	230	*Am. Express.*	
		Package transportation	.90
September 16	231	*U. S. Express.*	
		Package transportation	.75
October 1	232	*Western Telephone Co.*	
		Rent of telephone three months	9.00
November 5	233	*R. J. Farquharson.*	
		Salary three months as Secretary	300.00
		Expenses to Indianapolis, American Public Health Association	50.00
November 1	234	*L. F. Andrews.*	
		Salary one month	91.67
October 31	235	*Iowa State Register.*	
		1,000 blanks, Form 1C	7.50
October 2	236	*William Grefe.*	
		Ice 14 2-7 weeks, at 50c	7.15
October 10	237	*A. E. Foote.*	
		1 Galton	1.25
		1 Weale	2.50
		1 Hygeia	.25
		1 skeleton and crania	.15
		1 Record of Science, 1877-8	3.50
October 31	238	*Eime & Amend.*	
		1 New York State oil tester	6.75
October 31	239	*Carter & Hussey.*	
		2 quires 24-pound demy paper, ruled	2.10
		7 book-case labels	1.00
		50 paste-board cases	2.75
		Binding one book	.50
October 6	240	*Carver & Young.*	
		1 meteorological case	3.55
November 8	241	*Sanitary Engineer.*	
		1 year's subscription	3.00
October 6	242	*Comparet & Stark.*	
		1 nail-puller	2.50
		1 Zinc and screws	.45

FINANCIAL STATEMENT—CONTINUED.

DATE.	No. of voucher.	TO WHOM PAID.	AMOUNT.
October 2	243	*Redhead, Wellslager & Co.*	
		Pencils and eraser	$ .40
		2 century pens	1.00
		2 parallel rules	1.25
October 3	244	*U. S. Express.*	
		Package transportation	2.50
November 1	245	*Frank Davidson.*	
		Janitor service one month	2.00
October 21	246	*W. S. Robertson.*	
		Expenses to meeting of American Public Health Association	17.81
October 31	247	*American Express.*	
		Package transportation	3.65
November 10	248	*Post Office.*	
		500 No. 4½ 3 cent envelopes	16.20
		500 1 cent stamps	5.00
		500 2 cent stamps	10.00
		500 3 cent stamps	15.00
		100 10 cent stamps	10.00
November 20	249	5000 1 cent envelopes	58.00
December 5	250	*L. F. Andrews.*	
		Salary one month	83.33
November 9	251	*E. & F. N. Spon.*	
		Spon's Encyclopædia, two volumes	27.00
December 1	252	*Redhead, Wellslager & Co.*	
		1 quire record	1.00
		Tyndall's Floating Matter	1.20
		Magnis' Bacteria	2.20
		Clapp's Contagion of Consumption	.73
		12 volumes American Health Primer	5.22
		9 volumes Appleton's Health Primers	3.13
		1 Physiography	2.11
		1 Hygiene of Schools	1.60
		1 thermometer	.40
		1 dozen scratch books	1.50
		1 Reed's Ventilation	1.35
		1 Care of Children	2.07
		1 Construction of Hospitals	1.00
		Drawing paper	.35
November 29	253	*Carter & Hussey.*	
		50 Petitions to Congress	2.00
		5000 Circulars	10.00
November 17	254	*J. & J. H. Green.*	
		1 maximum thermometer	6.00
		1 minimum thermometer and packing	4.25
November 8	255	*U. S. Public Printer.*	
		Catalogue Surgeon-General's Office Library	6.00
November 13	256	*Thomas E. Pope.*	
		Analysis of water	4.50
November 30	257	*American Express Co.*	
		Package transportation	5.70
November 25	258	*U. S. Express Co.*	
		Package transportation	5.65
November 2	259	*E. & F. N. Spon.*	
		Denton's House Sanitation	3.50

FINANCIAL STATEMENT—CONTINUED.

DATE.	No. of voucher.	TO WHOM PAID.	AMOUNT.
December 1	260	*R. J. Farquharson.*	
		Cash paid for exchange on drafts	$ 2.00
December 1	261	*Theo. F. Gatchel.*	
		Care of room one month	2.00
November 16	262	*A. E. Foote.*	
		Kirkbride on Hospitals for Insane	1.69
November 3	263	Morselli on Suicides	1.36
January 5	264	*L. F. Andrews.*	
		Salary one month	83.33
December 21	266	*E. & F. N. Spon.*	
		1 Denton's Sanitary Engineer	10.00
		1 Adams on Sewers	2.00
December 3	267	*Carter & Hussey.*	
		2,850 envelopes, printing	3.50
		Binding one volume	.50
		125 slips	.75
		150 circulars, Form 37B	3.00
		500 meteorological blanks	3.50
December 30	268	*Redhead, Wellslager & Co.*	
		1 Model By-Laws	1.75
		Ramsey on Fallicies of Statistics	4.50
		3 pints mucilage	1.20
December 18	269	*J. D. Seeberger.*	
		2 Yale door locks	3.25
December 25	270	*Chas L. Smith.*	
		Fitting door lock	1.00
		1 Yale lock	2.25
December 30	271	*Theo. F. Gatchel.*	
		Care of room one month	2.00
December 12	272	*Carver & Young.*	
		100 mailing roller sticks	2.00
December 20	273	*U. S. Express.*	
		Package transportation	1.75
January 1	274	*A. H. Miles.*	
		1 dozen cocoa soap	.75
February 5	275	*R. J. Farquharson.*	
		Salary as Secretary three months	300.00
February 5	276	*L. F. Andrews.*	
		Salary one month	83.33
January 31	277	*Carter & Hussey.*	
		1,000 slips	.75
		500 blanks, Form 5C	19.00
		50 circulars, Form 38B	2.50
		1000 circulars	3.50
January 27	278	*E. A. Foote.*	
		Rapport Sur la Vaccine	.36
		Moquin's Medical Zoology	2.11
		Hand-Book on House Sanitation	3.22
		Leeds on Ventilation	.54
		Wanklyn's Milk Analysis	.64
		Trail's Medical Jurisprudence	1.07
		Cornaro's Methods to Maintain Long Life	.53
		Mass. Gen. Hosp. Report	2.24
		Prisons Department Philadelphia Report	4.40
		Cooke's Essays	.50
		Prestwitch on Poisons	1.66

FINANCIAL STATEMENT—CONTINUED.

DATE.	No. of voucher.	TO WHOM PAID.	AMOUNT.
February 1	279	*Redhead, Wellslager & Co.*	
		1 dozen scratch books	$ 2.00
		10 An. Reports of English hospitals	7.25
January 1	280	*Western Telephone Co.*	
		Rent of phone three months	9.00
January 19	281	*A. N. Bell.*	
		"Sanitarian" subscription	4.00
February 5	282	*American Express.*	
		Package transportation	2.75
February 1	283	*B. Watson.*	
		Janitor one month	2.00
December 30	284	*Post-office.*	
		U. S. Postal Guide	1.50
January 27	285	*Henry Plumb.*	
		Repairing clock	1.50
January 25	286	*A. Grefe.*	
		Two brooms	.80
January 29	287	*Mitchell, Bartlett & Crain.*	
		1 acid bottle	.40
January 15	288	*U. S. Express.*	
		Package transportation	.25
March 1	289	*Redhead, Wellslager & Co.*	
		½ ream legal cap	2.75
		1 bottle mucilage	.25
		8 pamphlet binders	8.00
		1 triangle	2.50
		4 Acme pads	1.00
		6 scratch books	1.00
		1 35-inch T square	1.00
		1 blank book	.25
		18 volumes Zemssen's Encyclopedia	108.00
March 5	290	*L. F. Andrews.*	
		Salary one month	83.33
February 22	291	*A. E. Foote.*	
		Dunn's Reports on English coal mines ventilation	7.50
		Dunn's Reports on English coal mine accidents	5.50
		Employment of children in coal mines	20.00
		Barton's Report on vital statistics of Louisiana	1.00
		Medical Register and Directory	4.40
		Lind's Essays on diseases in hot climates	.50
		Transactions of the Epidemiological Society, 1855	2.00
		Rush's Essays	.50
		Rush's Medical Inquiries	1.00
		Hammond's Physiological Memoirs	1.15
		Penn. Journal of Prison's Discipline	1.80
		Rush's Lectures	1.50
		Brigham's Mental Cultivation and Excitement	1.10
		Philadelphia Health Reports	7.00
		Easeie's Healthy Houses	1.50

FINANCIAL STATEMENT—CONTINUED.

DATE.	No. of voucher.	TO WHOM PAID.	AMOUNT.
March 1	292	*Mills & Co.*	
		1 rubber stamp	$ .75
		5 county maps	2.50
		5,000 circulars, Form 17B	38.00
		1,050 lithograph letter-heads	10.60
February 26	293	*Post-office.*	
		200 6 cent stamps	12.00
February 24	294	*Robert Clarke & Co.*	
		Drake's Diseases of Mississippi Valley	6.00
February 6	295	*Charles J. Tagliabue.*	
		1 ten inch thermometer	6.00
February 12	296	*Thomas E. Pope.*	
		Water analysis	4.50
February 12	297	*L. Harbach.*	
		1 stand	4.00
February 28	298	*Carter & Hussey.*	
		Binding "Sanitarian"	1.00
		Binding 1 volume Reports	1.25
		Binding 2 volumes	1.50
March 1	299	*F. N. Hossack.*	
		1 dozen towels	3.00
February 1	300	*B. J. Watson.*	
		Care of room one month	2.00
February 17	301	*Am. Express.*	
		Package transportation	1.40
February 3	302	*Comparet & Stark.*	
		1 Galvanized iron pail	1.00
May 5	303	*R. J. Farquharson.*	
		Salary as Secretary three months	300.00
April 30	304	*Carter & Hussey.*	
		200 Form 13E	47.00
		400 Form 14E	65.00
May 1	305	*L. F. Andrews.*	
		Salary two months, Assistant Secretary	166.66
April 23	306	*A. E. Foote.*	
		Londe's Compendio de Higiene, 2 volumes	1.00
		By-laws of Boston, 1801	1.50
		Irvington Sanitary Survey	1.00
		Reports of Brooklyn Board of Health	1.50
		Watson's Thermal Ventilation	.50
		Ballard on Typhoid Fever, and Impure Milk	.50
		Armstrong's Yellow Fever at Norfolk, 1855	.75
		Waring's Earth Closets	.35
		Catalogue of the Army Medical Museum, 2 volumes	6.00
		Thirteenth Annual Report of London Privy Council	.25
		Third Report Chicago Public Works	.75
		Digest of Laws of Philadelphia	.35
		Newberry's Report of U. S. Sanitary Commission in Mississippi Valley	2.00
		Smith's Hospital Construction	1.25
		Magnan's L'Alcoolisme	.75
		Ordronaux on Prophylaxis	.35
		Lee's Hand-Book for coroners	1.25

FINANCIAL STATEMENT—CONTINUED.

DATE.	No. of voucher.	TO WHOM PAID.	AMOUNT.
April 26	306	*A. E. Foote.*	
		Clark's Sanitary Code	$ .50
		Plans of John Hopkin's Hospital	3.00
		English Blue Book—Sanitary Commission	2.50
		English Blue Book—Herbert Hospital	2.50
		English Blue Book, 1868, 1870	2.00
		Cholera, cause, nature and prevention	2.50
		Yellow Fever Epidemics	2.00
		Hygiene and Physiology	2.00
		Hardenstein's Epidemics of 1878	.35
		Oleomargarine and Butter analyzed	.35
		Elliott on Vital Statistics, 1856, 1857	.60
		Les Ambulances	1.50
		Medical Essays on Hygiene	.50
		Mann's Relation of State Medicine to Intemperance	.35
		Report of Manchester Hospital for Children, 1856	.56
		Report of Manchester Hospital for Children, 1875	.30
		Mott on Effect of Alum in Baking Powders	.25
		Odorless Excavating Apparatus	.25
		Littre & Robinson's Dictionaire	7.50
		Caldwell's Memoirs	
		Report of American Social Scientific Association	1.00
		Journal of American Social Scientific Association	2.00
		Hassall on Adulteration of Food	5.65
May 1	307	*Redhead, Wellslager & Co.*	
		Zemssen's Encylopedia, 3 vols	18.00
		Handbook of Cholera	.50
		1 dozen pen holders	1.00
		Tidy on Legal Medicine	9.00
		1½ yards profile paper	.65
April 12	308	*Mills & Company*	
		Iowa Digest, 4 vols	25.00
April 26	309	*W. H. Dickinson.*	
		Expenses to Sanitary Council Miss. Valley	62.50
April 26	310	*Robert Clarke & Co.*	
		Blythe's Hygiene	7.20
		Edwards on Vaccination	.40
		Barker on Malaria	2.00
		Fort's History of Medical Economy in Middle Ages	2.00
		Guy on Health	1.67
		Fayrer on Diseases in India	4.00
		Robinson on Sewerage	2.00
		Virchow on Post-Mortems	1.17
		Taylor on Poisons	5.33
		Quain's Dictionary of Medicine	11.33
		Health of Towns	3.00
		Science in Short Chapters	.25

FINANCIAL STATEMENT—CONTINUED.

DATE.	No. of voucher.	TO WHOM PAID.	AMOUNT.
March 31	311	*Carter & Hussey.*	
		150 circulars, Form 17B	$ 2.00
		125 circulars, Form 8C	3.00
		Printing 300 stamped envelopes	1.00
		125 circulars, Form 8C	3.00
		500 envelopes, Form 4A	3.50
		1 sponge cup	.75
		125 circulars, Form 40B	3.00
April 1	312	*Western Telephone.*	
		Rent of phone 3 months	9.00
April 26	313	*U. S. Express.*	
		Package transportation	6.55
May 1	314	*R. J. Farquharson.*	
		Amount advanced to pay interest 2 months, on money borrowed at bank to pay contingent expenses of the board for 2 months.	6.00
April 25	315	*Weaver & Maish.*	
		Water color paints and brushes	4.00
April 24	316	*J D Seeberger.*	
		1 pair tramel points	1.25
May 1	317	*Edward Banks.*	
		Janitor 2 months	4.00
		Cleaning room	1.75
March 23	318	*Al. Grefe.*	
		1 cedar pail	.75
April 24	319	*American Express.*	
		Package transportation	7.05
June 28	320	*Post-Office.*	
		1,000 10 cent stamps	100.00
		100 15 cent stamps	15.00
		2,000 1 cent stamps	20.00
		500 3 cent envelopes, 4½	16.10
		500 3 cent envelopes, 5	16.20
July 1	321	*L. F. Andrews.*	
		Salary two months, May and June	166.66
June 5	322	*Robert Clarke & Co.*	
		Scientific American Supplement, 14 vols	49.00
		Walford's Insurance Encyclopædia, 5 vols	45.00
		Fannings' Water Supply of England	6.00
		Annual Report Local Government Board	4.00
June 28	323	*Mills & Co.*	
		4 stereotype cuts	2.00
		1 Peerless arm rest	1.50
		1 map of Sac county	.10
		1 ream lithograph letter-heads	9.00
		500 circulars, Form 43B	7.00
		2,000 blanks, Form 4C 1,000 blanks, Form 5C 1,000 blanks, Form 6C	65.00

FINANCIAL STATEMENT—CONTINUED.

DATE.	No. of voucher.	TO WHOM PAID.	AMOUNT.
June 26	324	*Carter & Hussey.*	
		2,000 blanks, Form 6E	$ 15.00
		Printing 200 envelopes	1.75
		Binding, 1 vol	1.50
		500 circulars, Form 42B	2.00
		Binding, 2 vols	2.00
		150 circulars	5.50
		150 circulars, Form 11B	3.50
June 1	325	*Redhead, Wellslager & Co.*	
		1 dozen scratch books, No. 40	2.40
		1 quart Stafford's ink	.75
		6 dozen Dixon's pencils	3.30
		1 pint mucilage	.50
		1 blank book	.50
		Fleming on Animal Plagues	9.72
		Fleming on Veterinary Science	8.10
		1 bottle green ink	.20
June 27	326	*Bond & Chandler.*	
		2 wood cuts and designing	25.00
June 10	327	*Post-Office.*	
		1,500 1 cent envelopes	17.10
June 13	328	*Munn & Co.*	
		Scientific American Supplement, 1883	5.00
		Binder for Supplement	1.50
June 26	329	*American Express.*	
		Package transportation	4.90
July 1	330	*Edward T. Banks.*	
		Janitor for June and May, 2 months	4.00
June 28	331	*Western Union Telegraph.*	
		Telegrams	2.77
June 19	332	*U. S. Express.*	
		Package transportation	1.10
		Total miscellaneous	$ 7,228.54
		Expenses of Board meetings	739.00
		Total expenditures	$ 7,667.54

APPROPRIATION ACCOUNT FOR FISCAL PERIOD:

April 3, 1882	Appropriation	$ 5,000.00	Expenditures, April 4, 1882, to May 3, 1883	$3,994.55
April 3, 1883	Appropriation	5,000.00	Expenditures, May 3, to July 3, 1883	2,060.34
		$10,000.00		$6,054.89
			Appropriation unexpended	$3,944.11

EXPENDITURES FOR MEETINGS OF THE BOARD.

1881.		
Nov. 2.	Smith McPherson, attendance and mileage, at Des Moines..	$ 30.00
	J. M. Hull, attendance and mileage, at Des Moines.....	34.00
	W. H. Dickinson, attendance and mileage, at Des Moines...	5.00
	E. M. Reynolds, attendance and mileage, at Des Moines....	23.00
	H. H. Clark, attendance and mileage, at Des Moines.....	38.00
	Geo. F. Roberts, attendance and mileage, at Des Moines....	28.00
	James L. Loring, attendance and mileage, at Des Moines...	8.00
	Wm. S. Robertson, attendance and mileage, at Des Moines.	17.00
	J. M. Hull, mileage to Albert Lea, Sanitary Council.....	4.00
	Geo. F. Roberts, mileage to Albert Lea Sanitary Council....	12.00
1882.		
May 2.	E. M. Reynolds, attendance and mileage at Muscatine.....	23.00
	W. S. Robertson, attendance and mileage, at Muscatine....	5.00
	P. W. Lewellen, attendance and mileage at Muscatine.....	50.00
	W. H. Dickinson, attendance and mileage, at Muscatine....	20.00
	J. M. Hull, attendance and mileage, at Muscatine.....	34.00
	S. B. Olney, attendance and mileage, at Muscatine.....	30.00
Nov. 1.	W. S. Robertson, attendance and mileage, at Des Moines....	20.00
	W. H. Dickinson, attendance and mileage, at Des Moines...	5.00
	S. B. Olney, attendance and mileage at Des Moines.....	15.00
	J. M. Hull, attendance and mileage, at Des Moines.....	28.00
	P. W. Lewellen, attendance and mileage, at Des Moines....	30.00
	E. M. Reynolds, attendance and mileage, at Des Moines....	23.00
	H. H. Clark, attendance and mileage, at Des Moines.....	43.00
	J. L. Loring, attendance and mileage, at Des Moines.....	10.00
1883.		
May 3.	W. S. Robertson, attendance and mileage, at Des Moines....	20.00
	W. H. Dickinson, attendance and mileage, at Des Moines...	5.00
	P. W. Lewellen, attendance and mileage, at Des Moines....	30.00
	J. M. Hull, attendance and mileage, at Des Moines.....	28.00
	S. B. Olney, attendance and mileage, at Des Moines.....	15.00
	E. M. Reynolds, attendance and mileage, at Des Moines.....	23.00
	H. H. Clark, attendance and mileage, at Des Moines.....	43.00
	S. McPherson, attendance and mileage, at Des Moines.....	30.00
	J. L. Loring, attendance and mileage, at Des Moines.....	10.00
		$739.00

CLASSIFIED EXPENDITURES.

Chemical analysis	$ 16.25
Engraving	61.05
Members attendance at Board meetings	739.00
Other official	653.06
Instruments and books	716.96
Paper and stationery	103.91
Postage, Secretary's office	616.30
Postage, members	1.00
Printing and binding	930.75
Salary of Secretary	2,109.00
Salary of Assistant Secretary	1,694.96
Express on packages	83.35
Office fixtures	133.30
Ice	11.90
Janitor	45.00
Telephone	60.75
Miscellaneous items	11.10
	$7,967.54

RECEIPTS—WARRANTS ON STATE TREASURER.

DATE.		NUMBER OF WARRANT.	Amount.
1881.			
October	4	Warrant No. 37516	$ 144.23
November	2	Warrant No. 37897	199.00
November	2	Warrant No. 37898	476.38
November	21	Warrant No. 68	30.00
December	5	Warrant No. 177	177.83
December	5	Warrant No. ——	16.20
1882.			
January	5	Warrant No. 525	228.13
February	4	Warrant No. 927	420.30
March	7	Warrant No. 1476	231.68
April	4	Warrant No. 2118	393.21
May	4	Warrant No. 2363	20.00
May	4	Warrant No. 2364	464.08
May	4	Warrant No. 2365	162.00
June	4	Warrant No. 2621	246.47
July	7	Warrant No. 3006	194.67
August	3	Warrant No. 3311	648.52
September	4	Warrant No. 3526	144.92
October	4	Warrant No. 3837	143.02
November	1	Warrant No. 4081	515.18
November	1	Warrant No. 4082	174.00
November	13	Warrant No. 4139	56.20
November	24	Warrant No. 4234	58.00
December	4	Warrant No. 4360	188.84
1883.			
January	3	Warrant No. 4591	127.53
February	4	Warrant No. 4968	300.00
February	4	Warrant No. 4969	157.91
May	3	Warrant No. 5633	1,417.69
July	3	Warrant No. 5092	642.65
			7,978.64

WORK OF THE BOARD.

It is pertinent to inquire what has been accomplished by the State Board. There is good reason to believe that progress has been made in improving the sanitary and hygienic condition of the people of the State, thereby lessening the mortality rate, and securing a better appreciation of the health law among the people.

The people know already that nothing is so costly as sickness. They will not be slow to seek and avail themselves of all possible means of prevention thereof. Statistics show conclusively that the deaths caused by preventible diseases are nearly double those from all others combined. Self-protection and economy suggests the remedy. This remedy the State Board has endeavored to give the people. Rules and regulations have been prepared and scattered over the State providing for restriction and prevention of contagious and dangerous diseases, which if carried into full force and effect will accomplish the desired end. It rests with the people to secure the benefits thereof. The State Board has no power to enfore its rules and regulations. During the past two years Small-pox, Scarlet Fever, and Diphtheria have prevailed over the State, and but for the restrictive measures provided by the State Board would have become epidemic with a fearful mortality. In every instance of an outbreak of these diseases where the rules and regulations of the State Board were enforced and carried out, the disease was easily controlled, and promptly exterminated, with small loss of life. The State Board have no hesitancy in asserting, and are firm in the conviction, that Scarlet Fever, that terrible scourge of children, more dangerous than Small-pox, can be completely controlled and prevented, in any community by a strict compliance with the rules provided therefor, but no more so, than other communicable diseases.

Experience will demonstrate the wisdom and value of these measures designed especially to diminish the loss of life, suffering, and consequent cost to the people.

The State Board is gratified with the progress made, and satisfied with the results so far attained.

VENTILATION,

BY

JUSTIN M. HULL, M. D.,

MEMBER OF THE

STATE BOARD OF HEALTH,

AND

CHAIRMAN OF THE STANDING COMMITTEE ON VENTILATION AND HEATING.

VENTILATION.

The proper study of mankind, is man. Man is the most expensive and costly of all the animal creation. Twenty-one years of costly expenditure of the industries of the world are required to develop a full grown man.

The value of human life can scarcely be estimated. The courts have fixed a money value thereon, but it has a relative value to society which cannot be estimated in money. If human life should be saved because of the money there is in it, how much more because of the manhood there is in it? The death of an educated man is a public loss. To prevent the loss of educated men should be the highest duty of society. The law makes homicide a capital offense; it should make suicide a felony. Logically, equal safeguards should be supplied for the preservation of the public health.

A sound mind should be preserved in a sound body. To secure this measure of great public economy, "health is wealth". An important element in the attainment of perfect health is pure air. Vitiated air is a prolific source of disease. Every adult person inhales about 360 cubit feet of air each twenty-four hours. A large proportion of human life is spent in buildings—the dwelling, shop, or office. It is important, therefore, that this required amount of pure air should be accessible, or supplied, every hour. The air we breathe contains elements essential to human life: oxygen and nitrogen. Two others are always present to a greater or less degree: carbonic acid and water. The first is absolutely necessary to support animal life. Smith gives the ratio of pure air at

Nitrogen	79.00
Oxygen	20.96
Carbonic acid	0.04
	100.00

It may be said, therefore, that bad air begins at 20.96 maximum. The amount of carbonic acid permissible in air for respiration is given by Pettenkoffer at seven parts in 1,000, in dwellings. Dr. de Chaumont gives six in 1,000.

Pettenkoffer says air is bad and impure for continuous use, when it contains in consequence of respiration and perspiration more than one part of carbonic acid, in 1,000. And a good air for chambers in which a person may remain for a long time in a state of health and comfort, contains no more than seven parts in 1,000. Parkes, in his manual of hygiene, says: "When air more moderately vitiated by respiration is breathed continuously, its effects become complicated with other conditions." There is no doubt that breathing the vitiated air of respiration has a most injurious effect on health. Persons soon become pale, and partially lose their appetite, and after a time decline in muscular strength and spirits. The areation and nutrition of the blood seems to be interfered with, and the general tone of the system falls below par. Of special diseases, pulmonary affections are more common.

The sensitiveness of the digestive organs to foul air in the hot season is well known. Heat does not produce diarrhœa; with pure, dry, hot air there may be perfect health; but with even moderate heat in close cities, where there is imperfect circulation of air, where there is present filth and atmospheric moisture, there will be bowel complaints.

"Impurity of air arises from a variety of decompositions occurring in soil, rubbish, animal exhalations, and excreta, and dead organic matter, generally. If certain limits are observed, large and dense populations may retain a fair degree of health, provided that the laws of private cleanliness are observed, and the soil and air are protected from public nuisances. Cleanliness of the person and clothing is a most important factor in purity of atmosphere. Even abundant means of ventilation will fail to keep the air of a schoolroom wholesome, if the children are unclean."—(Buck's Hygiene.)

To treat of the impurities of the air would require much time, more than I have the liberty to devote to the subject. It is not strictly within the purview of this report. I shall, therefore, confine myself to internal air. Numerous observations, made by medical officers of the army, establish the fact that in all inhabited rooms which are not perfectly ventilated, the presence of scaley epthelium,

round cells, like nuclei, portions of fibers, portions of food, bits of human hair, wood, and coal, can be found in addition to the bodies which are present in external air.*

In some cases papers colored green by arsenical preparations give off minute particles of arsenical dust, which diffuse in the room, and are no doubt the cause of some cases of arsenical poisoning.† In addition to being vitiated by respiration, the air of the sick rooms become contaminated by the abundant exhalations from the bodies, and by the effluvia from discharged excretions.‡

Animal exhalations in crowded rooms, when condensed upon cold glass and allowed to stand, dries up and forms a thick glutinous mass.¶

We often see instances of this nature in dirty houses, and in such cases there is always a disagreeable odor.

An adult man at ordinary work gives off from twelve to sixteen cubit feet, according to his weight, of carbonic acid gas, when not at excessive work. The amount as given by Pettenkoffer is 0.7 feet. Women give off less. The skin and lungs pass off from twenty-five to forty ounces of water in twenty-four hours, to maintain which in a state of vapor, 211 cubit feet of air per day are necessary. Organic matter is also given off by the skin and lungs. This organic matter from the lungs is found by Taddie to be nitrogeneous and oxidisable. It has a very fœted smell, is retained in a room some time, even for hours when there is free ventilation.

It is absorbed most by feathers, damp walls and moist paper. The least by straw and horse-hair. The color of the substance influences the absorption most in the following order: black, most; then blue, yellow and white.‡

Air is also vitiated by combustion. Coal and coke throw off carbonic oxide, carbonic acid, the carburretted hydrogen gasses, and sulphurous acid. The latter may be passed without notice as they seldom appear in objectionable quantity. Carbonic acid forms in the lower part of the burning coal, rises through the heated mass, mixes with more carbon and becomes changed to carbonic oxide, a most virulent poison even in the smallest quantities. Any escape of

*Medical Army Report of 1860.
†70 Halley.
‡Parke's Hygiene.
¶Smith on Air and Rain.

either carbonic oxide or carbonic acid as a mixture into a living room should be specially guarded against.

The flues or pipes furnished with coal burning stoves as is generally supposed, do not carry all the product of combustion into the outer air.

These poisonous oxides enter the room through the iron of the stove at the joints and doors in consequence of the downward air currents.

Coal gas will vitiate the air of a room. One cubic foot of it will unite with from 9 to 1.64 cubic feet of oxygen, and produce on an average two cubic feet of carbonic acid, and from two to five grains of sulphurous acid, or in other words, one cubic foot of gas will destroy the oxygen of eight cubic feet of air.

Air is vitiated by sewage matter and sewers. The gases evolved from sewers and cess-pools will pass easily through solid brick walls. Fungi grow rapidly in such air, and milk and meat soon become charged by its impurities.

When the air of sewers penetrates houses, and especially bedrooms, it causes greatly impaired health, especially in children. They lose appetite, become languid and pale, and suffer from diarrhœa. Adult persons suffer from headache, malaise and feverishness. It aggravates most decidedly the severity of *erysipelas*, *gangrene*, puerperal fever (Rigby), and it has been demonstrated that pneumonia may be produced by it. Two special diseases are mainly attributed to it, diarrhœa and typhoid fever.*

What physician does not agree with Dr. Noel that the unclean back yards, improperly watched water-closets, exposed slops in the back alleys, emanations from cess-pools, contaminated wells, is a common cause of diphtheria.

Dr. Fox, in his "Sanitary Examination of Air", says: "It is the breathing of devitalized air that makes the child of the town so pale, and lax and feeble compared with the child of the country. It is this air which renders the atmosphere of the crowded hospital so deficient in sustaining power. It is this air which gives to many public institutions where large numbers of ill-clad, unclean masses are herded together, that 'poor smell' so depressive to the senses and to the animal powers. In many private houses even of the wealthy, streams of devitalized air, are nursed with the utmost care. There

*Health Reports of English Towns.

is the lumber-room in which all kinds of things are huddled away and excluded from light and air. There are dark under-stair closets in which cast off clothes charged with organic debris of the body, are let rest for days and even weeks together. There are bed-rooms overstocked with furniture, the floors covered with heavy carpets in which are collected pounds upon pounds of organic dust. There are dressing-rooms in which are stored away old shoes, and well packed drawers of old and well worn clothing. There are dining-rooms in which the odor of the latest meal is never absent, and from the cupboards of which the smell of decomposing meat or cheese is always emanating. There are drawing-rooms in which the scent of decayed roses or the varnish from the furniture or the dye from the table-covers is always present. There are the kitchens in which there is the odorous indications of perpetual cooking.

"There are water-closets in which at every time of day or night you will detect the persistent amomniacal odor. Who is there unacquainted with the unwholsome atmosphere to be met in nearly every public building, while the dining-rooms, bed-rooms and drawing-rooms of even our best houses are too often in a disagreeable state of closeness. I have always maintained that the impure air of our houses, public and private, has much to do with the great prevalence of such diseases as phithisis, pulmonalis, bronchitis, and pneumonia. Unventilated and over-crowded workshops and schools are moreover the nurseries of strumous diseases in general, which saps the strength of the community. Physicians are waiting for inventors to devise some simple method of ventilating the houses of the poor as well as the rich, by which there can be frequent renewal of air.

"In churches, public halls, and large rooms, there is no difficulty.

"So far nearly all the patents yet devised are worthless in that they utterly fail to fulfill the requirements of a good ventilator, which is to secure the constant passage into each room of pure air, of a healthful degree of humidity—warmed in winter and cooled in summer, with an accompanying provision for the immediate removal of that which has been breathed in such a manner that no draught has been created."

I am constrained to indorse these expressions of this eminent writer since Dr. Benjamin W. Richardson, a member of the Royal College of Physicians, in a lecture, used precisely the same language, and it appears *verbatim* in his work on "Diseases of Modern Life."

Dr. Richardson also says in his work: "I am satisfied that by living in a close, ill ventilated room, and especially by sleeping in such a room, consumption can be readily induced, in those predisposed to it, and may *possibly* be induced in those clear of hereditary taint. A man, by occupation a peddler, who traveled from fair to fair, and lived in his own van, from which he sold his wares, was brought to me in the third stage of consumption. He soon died and was succeeded by his brother who followed the same business, in the same way, and died of the same disease. He was succeeded by his sister's husband, who died in like manner. I had nine victims of consumption as the result of sleeping in that van. The first bought it new. It was subsequently regularly cleaned and painted. He therefore did not get the disease by process of contamination in the first instance.

"The physician who enters a plague-stricken house is guided largely in his estimation of the chances of recovery or death by the surroundings of the patient, and the detection of the presence or absence of devitalized air."

METHODS OF VENTILATION.

To secure pure air has arisen the science of ventilation, from *ventus*, wind, or air in motion.

Applied to buildings various methods have been adopted, and the genius of man has developed a vast amount of theory and some practical devices.

There are two methods of ventilation: natural and mechanical. Of the latter there are also two methods, by fans and a system of propulsion.

It is not the province of this report to adopt or recommend any special method of mechanical ventilation, or to advance any theories of my own. I shall simply collect and epitomize the result of practical observation and experiment of scientists of acknowledged ability and authority as found in their published works. The endeavor will be made to show the importance and necessity for ventilation, to the end that health may be preserved and life prolonged. But the more I study and investigate the subject, the more I am convinced that ventilation is a lost art.

True and successful ventilation consists in the free access of pure air into a building, and the escape of bad or vitiated air therefrom. Whatever mechanical device most effectually secures this result is most to be commended. If they are wanting in adaptation to either of these conditions, they are worse than useless.

It is estimated that there is required of fresh air for every person each hour, in hospitals for ordinary patients, 2,000 to 2,800 cubic feet; in hospitals for wounded patients, 4,300 cubic feet; in hospitals for epidemic patients, 5,600 cubic feet; in prisons, 2,100 cubic feet; in workshops, from 2,000 to 2,300 cubic feet; in barracks, from 1,000 to 1,650 cubic feet; in theaters, from 1,400 to 2,400 cubic feet; in churches, from 1,000 to 2,000 cubic feet; in school-houses for children, from 400 to 500 cubic feet; in school-houses for adults, from 800 to 1,000 cubic feet.

Ranke in his "Elements of Physiology" fixes 2,118 cubic feet per hour as the average minimum amount necessary for each individual.

Architecture bears an important relation to hygiene. Buildings may be classified for ventilation purposes into four groups:

1st. Dwellings.
2d. Manufactories.
3d. Public Buildings.
4th. Hospitals.

Thus far reference has been made only to natural ventilation.

Artificial Ventilation.—Artificial ventilation is accomplished by *extraction* (drawing out of air) or by *pronulsion* (forcing the air into a building).

Ventilation by Extraction.—Ventilation by extraction is accomplished by heat, steam, fan, or screw, so as to draw the air out. A common chimney with an open fire place is a good example of extraction by heat, also of a good ventilator. With an ordinary fire, a common chimney will furnish outlet sufficient for four or five persons.

All openings into the room become inlets. If there are too many there will be down draughts in the chimney, hence the openings must be regulated according to the outlet. The ventilation of coal mines is usually produced by extraction, by heat.

Ventilation by propulsion was first invented by Desaguliers in 1734, and consisted of a wheel, or fan placed in a box. The air passed in at the center of the wheel and was thrown outward by fans into a tube. This plan is adapted to large buildings and halls, where a rapid change of air in large quantities is required.

DWELLINGS.

The object of ventilation in dwellings is to remove by a constant current of outer or pure air, the pulmonary and cutaneous exhalations of the inmates and the combustion of lights. "All other causes of impurities of air in dwellings," says Dr. de Chaumont, "ought to be excluded by cleanliness, proper removal of solid and fluid excreta and other attention to surrounding conditions."

PURITY OF AIR.

In reply to the query, What is to be considered the standard of purity of air in dwellings? Dr. de Chaumont says: "We cannot demand that the air of an inhabited room shall be absolutely pure as the outside air. In every dwelling there will be some impurity of air. The quantity of air supplied to every inhabited room should be great enough to remove all sensible impurity, so that a person coming from the external air would perceive no trace of odor, or difference between the room and the outside air in point of freshness. Following this is the amount of pure external air which should pass through the air of a room vitiated by respiration per head per hour."

To answer this, Dr. de Chaumont, as the result of numerous experiments says that per man, for each 100 cubic feet of space, 2,900 cubic feet of fresh air is required the first hour, and 3,000 cubic feet each hour thereafter. If a man is engaged in active work he should have more. If he weighs 150 pounds he should have from 4,500 to 8,600 of cubic feet of fresh air every hour.

Air is also vitiated by the combustion of coal gas. Walport estimates that for every cubic foot of gas 1,800 cubic feet of air must be supplied to dilute the product of combustion. A cubic foot of coal gas will produce nearly two cubic feet of carbonic acid. A common three-foot gas burner, burning four hours, will require 21,600 cubic feet of pure air.

NATURAL VENTILATION.

As to the methods of natural ventilation there are many devices. The air must be taken from a pure source. As a rule, says Parkes "the inlet tubes should be short and so constructed as to be easily cleaned, otherwise dust lodges in them and the air becomes impure. They should be numerous and small, say from forty-eight to sixty inches superficial, so that the air may be properly distributed. They

should be conical or trumpet shaped where they enter the room, as the air spreads out like a fan.

If placed above the heads of persons, they should turn upward, to lessen the risk of down draft. Externally, they should be protected from the wind by an overhanging hood or shelf. Valves may be placed in them to check too rapid change of air in cold weather. They should be distributed through a room so as to insure proper mixture of air. They should not be placed too near an outlet. If air cannot be warmed, it must not be admitted at the bottom of a room, but about nine or ten feet from the floor, and be directed toward the ceiling so that it may pass up and then fall and mix gradually with the air of the room.

Outlet pipes.—The place for outlet pipes is one of important consideration. If there is no means of heating the air passing through them, they should be placed at the highest point of the room, enclosed as far as possible within walls, so as to prevent the air being cooled. They should be straight, with perfectly smooth internal surfaces so the friction may be reduced to the minimum. They may be round or square. They must be covered above by some apparatus (cowl, hexagon tube, etc.,) which may aid the aspirating power of the tube and prevent the passage of rain into the shaft. The causes of downward draught in outlet tubes are, wind which forces down the air, rain gets in, evaporates and cools the air so it becomes heavier than the air in the room, or the air becomes too much cooled by passage through an exposed tube, so it cannot overcome the weight of the superincumbent atmosphere; or another outlet shaft with greater discharge may reverse the current.

Should down draught occur, flanges may be placed a little distant below the tubes so as to throw the air upward before it mixes with the air of the room. If there are several outlet tubes in a room they should all commence at the same distance from the floor, be of the same height (or the discharge will be unequal), and have the same exposure to the sun and wind.

Simple ridge openings may be used in one-story buildings with slanting roofs; they ventilate thoroughly, but snow sometimes drifts in. The discharge of outlets is much more certain and constant if the air be warmed. The chimney with open fire is an excellent outlet—so good that in dwelling-houses if there are proper inlets, no other outlet need be made. Every room and dwelling-house should

have an open fire-place. When rooms are large and more crowded, other outlets are needed. The heat of the fire in such rooms may be utilized by surrounding the smoke flues with foul-air shafts.

Plans of pipes.—Of the various plans proposed for air-tubes and shafts, Dr. Parkes recommends McKinnell's circular tube.*

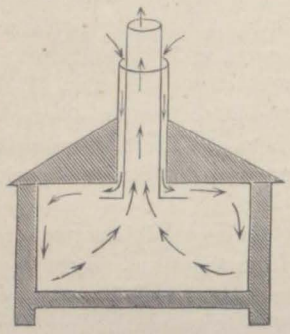


Fig. 1.

See Figs. 1 and 2. It consists of two cylinders, one encircling the other, the area of the inner tube and encircling tube being equal. The inner one is the outlet tube; it is so because the case of the other tube maintains the temperature of the air in it; and it is also always made rather higher than the other; above it should be protected by a revolving cowl. The outer cylinder, or ring, is the inlet tube; the air is taken at a lower level than the top of the outlet tube; when it enters the room it is thrown up toward the ceiling, and then to the walls by a flange placed at the bottom of the inner tube; the air then passes from the walls along the floor toward the center of the room and upward to the outlet shaft. Both tubes can be arranged to close by valves If there is a fire in the room both tubes may become inlet tubes; to prevent this the outlet tube should be closed. The movement of air by this plan is imperceptible and it is an admirable plan for square rooms or small churches; for long halls it is less adapted. The tubes may be of any size, from six inches for ordinary living rooms, to seven or eight feet, for churches. The two tubes after passing out of the room may be carried in different directions, care being taken that the inner tube is the largest. An advantage would be gained if the two tubes could be kept together some distance, as the

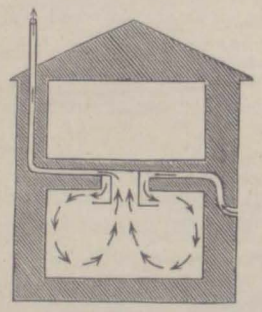


Fig. 2.

*Parke's Hygiene, page 163.

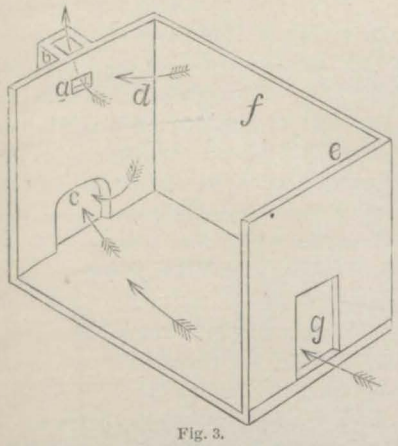


Fig. 3.

r of the inner tube would transmit heat to the incoming air, so that it would enter the room at a higher temperature than it otherwise would.

Ventilation by the open fire place is admirably illustrated by Burn in his little work on "Sanitary Science," page 82.

The withdrawal of pure air is illustrated by Fig. 3 copied from Mr. Burns work. An opening is made at *a* in the breast of the chimney *b* of the fireplace *c*.

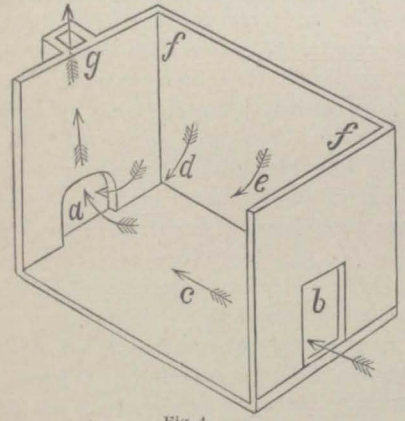


Fig. 4.

Fig. 4 shows the ordinary kind of ventilation carried on in which there is a fire-place *a*. The currents are mostly drawn by this along the floor from the door *b* as shown by the arrow *c*. The arrows *d e* indicate the currents from windows in close proximity to the fire-place, but the air lying near the ceiling, as at *f f* and *g*, is rarely influenced by the draught of a fire-place *a* even when there is an opening in the breast as at *a* in Fig. 3.

Probably the best plan of ventilation by open fire-places is that known as the Galton, a description of which was given by our Secretary in his last report, and which is here reproduced:

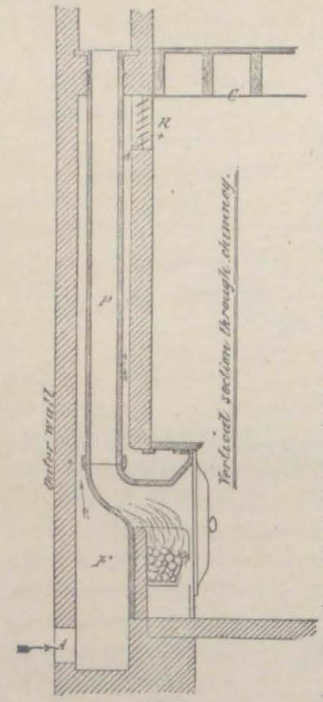


Fig. 5.

These grates are built into the chimney (Fig. 5)—this is a very delicate job and requires an expert in the building of fire-places and chimneys—and are of iron, but have a lining of fire-clay. From the throat of this grate an iron pipe rises some ten feet, (just above the ceiling C), terminating in a flue, which runs the remainder of the chimney, and should terminate in a cap.

The air admittted from the outside at the base of structure A, is warmed by contact with the heated sides and back F of the grate, then after being still further heated by surrounding the iron pipe in its ascent, is delivered into the ward from a lowered opening or register R, placed just beneath the ceiling C. The opening at A should be carried to the outer air by a pipe or flue.

Edward Smith, a member of the Royal College of Physicians, in his standard work on *Foods* gives the following general directions for ventilation:

1st. Inhabited rooms should if possible have external walls on two sides, so that air may be admitted through both.

2d. The openings should be small and many, rather than few and large, defended by perforated zinc, and placed as distant as possible from those who inhabit the room. Hence the cornice above and the skirting below are convenient protections, but rooms of less than ten feet in height are not easily ventilated without draughts. The connection between the inside and outside of the room should not be direct, but at an angle so that a direct current may not be produced.

3d. Such ventilations as direct the current to the ceiling are useful in a degree, but the cold air thus admitted will descend before the air is warmed.

4th. Channels which are divided by a perpendicular diaphragm on the theory that there will be an ascending current in one and a descending current in the other, are for the most part based on a fallacy, and when the heat of the air is very great there will be an upward and downward current in both.

5th. An air flue by the side of the chimney flue, into which the exit tubes lead, will act in some degree so long as there is fire in the chimney to rarefy the air; but if an archimedean screw be placed at the top of such a flue, it will produce an upward current when there is no fire, provided there is wind to move it. This apparatus may be attached to any air flue placed in any position.

6th. The use of the chimney flue as an exit for the air is liable to allow the smoke to enter the room through it when there is a down draught, notwithstanding the excellent contrivances which have been devised to prevent the return current.

7th. Whenever it is proposed to renew air, means for supplying a larger quantity of air should be provided, or the attempt at ventilation will be ineffectual.

8th. It is often desirable to warm as much of the air which is admitted as possible, and for that purpose stoves have been designed with an exit from a special channel into the room.

The idea advanced in the last rule of Dr. Smith may be carried out by placing the stove or heating apparatus in the cellar, or one room of the cellar. By this method the warmed air may be carried through every room in the building to the roof, where it makes its exit through a cowled flue.

Dr. John S. Billings, of the United States Army, says, in his work on Heating and Ventilation: "For an ordinary room in a dwelling-house which is to be heated by indirect radiation—that is by warm air, it will be necessary in order to secure satisfactory warming, when the temperature of the external air is below the freezing point and the room has the usual proportion of external wall and window surface, that the amount of air supply shall be about one and one half times the cubic contents of the room. I would advise that heating surface, foul and fresh air flues, and registers, be provided for an air supply of one cubic foot per second per head for rooms which are to be occupied constantly."

From J. J. Wade, a practical sanitary engineer, of Chicago, whom one of the papers of that city says has done more for the protection

of the public health of the people of that city, by his practical and successful devices for ventilation, than any one person, I have received a few suggestions, briefly stated, as the result of his practice in that city, and which has more than satisfied him. He says:

The Sewer Pipe.—The first point to be taken up is the sewer or drain pipe, which is laid under the house, and has almost invariably been an earthen pipe, which directly has lead to nearly all the trouble of defective sewerage, as the workmen usually who lay these pipes are inexperienced and careless, and do not cement the joints properly, and in great many instances the pipes are laid to such a depth beneath the surface, that whenever the pipe has been disturbed in the least, the joints have cracked, and sewage matter through these cracks has impregnated the earth to such an extent as to make the earth in the celler the medium of conveying gases through the building.

To avoid this danger, a cast iron pipe dipped in asphalt or tar, the joints caulked properly with lead, should be used instead, leaving no possible chance for any of those defects so prevalent in the earthen pipe. This iron drain pipe must be laid at a proper gradient, connecting with the main sewer in street. An iron running ventilating non-syphon trap should be placed in pipe at area or curb wall with man-hole built around it, and four inch ventilating pipes carried up to outer surface. Where this pipe is carried along in cellar, it should be laid in masonry arch, with small man-holes, so in case of stoppage of pipe it can be cleaned conveniently. The masonry arch should not be laid tightly around the pipe to interfere with the flow of any leakage which might possibly occur, and which would collect in man-holes and be easily detected there.

The Ventilation.—Of this sewerage system would demand all pipes to be carried through roof, and carried through chimneys where practical, in the following manner: An air pipe should be laid from house drain at a point outside from building up to four feet above roof; if building new, should be built in the wall of same material as drain pipe. Similar pipe should be run up an hot air flue, the outside pipe for the purpose of supplying pure air to the pipe carried up hot air flue, thus creating a constant circulation of air in house drain.

Water-closets, etc.—Where water-closets, bath-tubs, wash-stands, etc., are placed in building, an iron pipe similar to the one mentioned should be lead-caulked into drain-pipe in cellar, with hand-hole placed near elbow or fitting where they connect. This pipe should be carried up through roof. Every fixture should be trapped in the building and ventilating pipe carried from the top of each trap, and as near the water line of each trap as possible, and carried up independently through roof. Where basin waste-pipes are trapped, the overflow from them should be connected into the water-holder of the trap, and the trap placed as near the basin as possible, which applies to every fixture in building.

Lead-Lining should be placed beneath water-closets, bath-tubs and wash-stands, so when a leak or over-flow takes place, the parlor ceiling and surrounding wood work will be protected from soil and urinal matter. A waste pipe from this lead lining should be carried down to point in cellar, *not to be connected with any sewer*, as its services are only required in case of breakage, and then but for a time sufficient to repair same.

Lead-Safing System.—In majority of cases the safing in buildings done, is placed *on* floor immediately underneath the fixture in question, only acting as a preventive against an overflow, but in case of breakage of pipes *under* floor connecting with any pipes, it is of no service, and the very purpose it was intended for is frustrated. The correct system of doing this work is to countersink the joist, lay false floors in the parts countersunk, and made sink fashion, with incline to waste pipe. All traps, supply and waste pipes should be made to run along on top of this lead safing, thus protecting surrounding wood-work and ceiling underneath, leaving pipes exposed, which in case of leakage can be gotten at without the trouble of tearing up floors. No floors should be laid *over* safing, and where bathing tub is located it should be placed on iron strips, placing it on a level with floor, leaving two inches underneath; this space answers two purposes, detecting a leak in the tub, and acting also as an air-chamber, giving no opportunity of any foul matter or gases collecting. The water closet should be set in similar manner, a board only wide enough, across safing to allow the flange of the closet to be fastened to it securely. The seat and riser of water-closet should be hung door fashion, with threshold under riser, so that the door shall find no obstructing carpet when opened for purposes of cleansing space under closet. A pipe of galvanized iron or tin should be carried up through the roof from the inclosed space under these fixtures, for the purpose of carrying off all impure air which might collect. Where supply, waste, or other pipes run vertically they should be run up in a box built in partition, and front of box a door should be hung so that pipe can be gotten at without difficulty. Where running under floors a similar box should be made, lined with lead, with an incline toward the waste pipe, which should run down to cellar. The pipes are laid in this box with cover, hinged or screwed to the floor. Brass hand-holes should be placed in iron pipes and bends or T's, so that in case of stoppage they can be cleansed without breaking the pipe.

The system of ventilation I have given in this letter I have found to be the best in point of sanitary measures to be taken for a habitation, on account of its simplicity, which must commend itself to every person, and the only objection I have had to combat was, that there are no complications which would lead any one into a maze of uncertainty, into which high scientific authority is so prone to lead the general public. The public wish practical results. I have found in my many years experience, and the results of the system I give you, use and advocate, justifies me in believing as near perfect as the science of ventilation has reached to-day.

Mr. W. Mattieu Williams suggests in *Knowledge* that the problem of domestic ventilation might perhaps be solved by taking a lesson from the coal pits and extending the application of coal pit ventilation to modern residences. "In a pit the fresh air descends by one shaft, passes through all the workings and escapes through the upcast shaft. In a house, says Mr. Williams, no downcast shaft is required, the pressure of the surrounding air taking its place. But the model house must have an upcast shaft, placed as nearly in the middle of the building as possible, and communicating with every room, either by a direct opening or through a lateral shaft. An ordinary chimney built in the usual manner is all that is required. There must be neither stoves nor fire-places in any room excepting the kitchen. All the windows must be made to fit closely, as nearly air-tight as possible. Outside of the house, or on the ground floor, on the north side, if possible, should be a chamber heated by flues, hot air, steam or water pipes, and with one opening communicating with the outer fresh air, and another on the opposite side connected by a suitable shaft or airway with the hall of the ground floor and general staircase. Each room to have an opening at its upper part into the chimney, like Arnott's ventilator, and capable of adjustment as regards area of aperture, and other openings of corresponding or excessive combined area leading from the hall or staircase to the lower part of the room. These should be covered with perforated zinc or wire gauze, so that the air may enter in a gentle, broken stream.

All the outer house doors must be double, *i. e.*, with a porch or vestibule, and only one of each pair of doors opened at once. These should be well fitted, and the staircase air-tight. The kitchen to communicate with the rest of the house by similar double doors, and the kitchen fire to communicate with the upcast shaft or chimney by as small a stovepipe as practicable. The kitchen fire will thus start the upcast and commence the draught of air from the warm chamber through the house toward the several openings into the shaft. In cold weather this upcast action will be greatly reinforced and maintained by the general warmth of all the air in the house, which itself will bodily become an upcast shaft immediately the inner temperature exceeds that of the air outside. But the upcast of warm air can only take place by the admission of fresh air through the heating chamber, thence to hall and staircase and through the rooms into the final shaft or chimney.

In summer the kitchen fire would probably be insufficient to secure a sufficiently active upcast. To help this there should be in one of the upper rooms—say an attic—an opening into the chimney, secured by a small, well-fitting floor, and altogether inclosed within the chimney a small automatic slow combustion stove, or a large gas burner. The heating chamber below must now be converted into a cooling chamber, by an arrangement of wet cloths, or by the use of ice, so that all the air entering the house shall be reduced in temperature."

I find that nearly all publications on heating and ventilation are by English authors, and have reference to that climate. Their observations, therefore, are not applicable to this country, where we have a dryer atmosphere and lower temperature. For instance, the English standard at which the temperature of living rooms should be kept is placed at 60° Fahrenheit; that is much too low for this country. The standard here is about 70°. Hence in England, where there is greater moisture, fire-places are largely used, but in this country it is found necessary to resort to greater heat, and this is more readily supplied with direct radiation from a stove.

In his treatise on Ventilation for Health, Dr. Joseph Wilson, Medical Director of the U. S. Navy, who has given the subject careful and experimental study, says: "In rural districts, with abundance of wood for fuel, the old fashioned *ten plate* stove comes very near perfection for heating and ventilation of ordinary dwellings. The combustion absorbs the cold air of the floor into the stove, together with its impurities; and the stove-pipe, where it enters the chimney, not fitting too closely, permits the escape of any heated, impure air near the ceiling; while the window sashes, not too closely fitted, admit enough fresh air—sometimes a little too much. Houses thus warmed are healthy. The elegant equivalent of this is the Franklin stove."

The open fire-place is often referred to as the perfection of warming and ventilation. It is but a step in advance of a fire out of doors. The ventilation is abundant, but so far as architecture tends to mitigate the out-of-door character of the arrangement, it tends to retain the vitiated air at the upper part of the room. There seems to be an undue prejudice against air-tight stoves, perhaps because they are so named. They are not air-tight; they do not interfere with any ra-

tional ventilation of the room; the gases from combustion escape into the room less from these stoves than any other.

It is only necessary that the pipe shall not fit too tight in the chimney and the ventilation is assured for a small room.

It is best, however to use a large stove relatively to the room to be warmed, so that no part of the stove need be heated to red heat. The contrivance called a damper, in a stove pipe should never be used as by preventing the escape of gases up the chimney it forces them into the room. Probably the best contrivance for warming a single room is the radiator or base burner. With this kind of stove, warming and ventilation is secured. The cold air from the floor enters the stove; the vitiated air enters the chimney if the pipe does not fit too tight, or it may be carried off by other apertures.

Fresh air may be let in by the window sash by placing a strip under the lower sash, which will form an opening between the upper and lower sash.

F. Schumann, civil engineer of the U. S. Treasury, in his Manual on Heating and Ventilation, says: "Currents in ventilated rooms are either directed upward or downward; in the upward direction the pure air is admitted at or near the floor, the impure air passing off at or near the ceiling; in the downward direction the pure air is admitted at or near the ceiling or through inlets through the wall near the floor, and the impure air passing off through the floor or openings in the walls near the floor." "Public places where large crowds assemble should have the upward direction. Smaller rooms, offices, dwellings, etc., may be ventilated downward." The pure air inlets should be distributed equally around the room, with the outlets for impure air in such position as to cause the currents to sweep the entire room, being careful not to place an outlet directly over an inlet.

"In the upward movement the inlets may be in the floor, in risers of platforms, sides of walls near the floor. In stationery desks in front of stationery benches, etc., the outlets may be in the cornice or ceiling, or sides of walls near the ceiling. This method requires no change with seasons, the fresh air entering the same way in summer that it does in winter, when the room is heated.

"In the downward movement on the other hand the fresh air in summer may be admitted at or near the floor and passed off near the ceiling. Where windows are available and so placed that currents

pass through the room no other provision need be made for summer ventilation."

Velocity of currents per second.—When entering at or near the ceiling, and not less than twelve feet above the floor, and descending 1.8 feet; when the openings are the same as above and horizontal 4.0 feet; when entirely at or near the floor, (maximum) 2.0 feet; in ducts, shafts, etc., 3 to 10.0 feet.

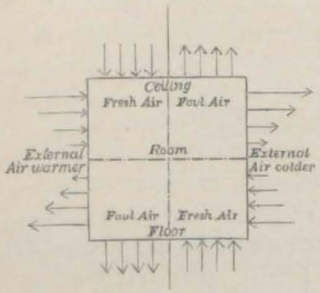


Fig. 6.
The arrows show the direction of currents.

"In cold weather, when the temperature of a room is higher than the external air, the air should be admitted at the bottom and passed off at the top of a room; in warm weather, when the temperature of the room is lower than the external air, the pure air should come in at the top and pass off at the bottom of the room.

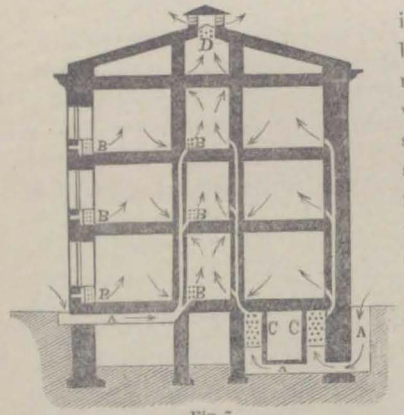


Fig. 7.

"The movement as shown in figure 6, can be reversed by either the *vacuum* or plenum method (heat or fan), when desirable, but they should coincide with and assist nature (gravity) it being more economical where ventilation is required. The vacuum movement is represented by figure 7, which represents a section through a building showing downward and upward movement of air current."

A room to contain not more than from 15 to 2 per cent of vitiated air must be supplied with from 5.6 to 49 times more fresh air than is vitiated plus that quantity required for illuminating purpose.

An adult man vitiates per hour ..... .215 cubic feet.
Every cubic foot of gas burned ..... 8.5 cubic feet.

Every pound of oil burned	150 cubic feet.
Every pound of candles (6 to a pound)	160 cubic feet.

The sources of heat in units in rooms per hour are:

By an adult	191
By one cubic foot of gas	600
By one pound of oil or candles	15,000 to 18,000
By an average four foot gas burner	2,400
By each flame from an oil lamp	430 to 515
By each flame from a candle	454 to 545

In order to give a better idea of proper methods of heating and ventilation of a dwelling, for heating is inseparably connected with ventilation, I would recommend the publication of the plans of a dwelling house, as given in an able treaties on this subject by Dr. John S. Billings, and printed in the Sanitary Engineer, October 18, and November 1, 1880. This would give the general public a more through knowledge of the subject than a hundred pages of explanatory notes.

There is one feature of house building which appears to be governed by no system or rule, and that is the mode of constructing chimneys.

Investigation of chimneys in a score of houses closely contiguous will show scarcely two alike, of the same dimensions. They appear to be constructed according to the caprice or fancy of the builder Probably not one chimney builder in fifty or one hundred can give any methodical or scientific reason for his method of putting up a chimney. It is no marvel then that we have smoking chimneys, and chimneys that draw the wrong way. The tendency is to make them too small, doubtless, from the increased use of stoves. Chimneys may be too large as well as too small. If too large the probabilities are there will not be heated air enough provided for it, and down drafts will be the result.

Upon this subject I quote from Dr. Billings:

"The shape of a flue should be as nearly round or square as the size of the walls and joints will admit. The circle is the best form because it gives the greatest area in proportion to the *perimeter*, or surface producing friction, and the square is next. If a flue is rectangular (as most chimneys are) with one diameter not more than four inches (the width of one brick) the friction will be great, and if such a flue be so placed that one of its long sides is parallel to a surface

of the wall which is exposed to cold air there will be a great loss of heat. For flues to carry the product of combustion, without reference to ventilation of ordinary dwellings, for each room if built in the usual way should be about one foot square, or for common bedrooms 9 x 12 inches. If lined with smooth pipes or cement they may be nine inches in diameter."

Fredgold's rule for chimneys for steam boilers is as follows: "The arc of a chimney in inches for a low pressure steam engine, when above ten horse power should be 112 times the horse power of the engine divided by the square root of the height of the chimney in feet."

Milne's rule is: The square root of the height of the chimney multiplied by the square of its internal diameter at the top or narrowest part in feet is equal to twice the nominal horse power for the chimney. By horse power herein is meant that a cubic foot of water at 60° evaporated to steam is equal to one nominal horse power.

The judges at the Centennial defined a horse power to be equal to the evaporation of thirty pounds of water from a temperature of 212°.

As a cubic foot of water weighs a little over sixty-two pounds, this standard requires less than half the fuel needed for the former, taking the older esimates used by *Fredgold* allowing eight pounds of coal per hour per horse power, and three hundred cubic feet of air for the combustion of each pound of coal, and we have for a forty horse power boiler about thirty cubic feet of gases per second to dispose of. Allowing five feet per second in the flue, a flue having an area of six square feet would be necessary. Another rule is for the ordinary horizontal flue boilers, that the chimney should be from sixty to eighty feet high, and have an area equal to half the square of the diameter of one of the tubes multiplied by the number of tubes. In such a boiler, fifteen feet of boiler surface is reckoned as one horse power.

To remedy smoking chimneys, see that each has its own sufficient supply of air from without, and that one does not draw against another flue.

To illustrate in one of the large public buildings in Washington were several rooms freely communicating with each other, and each having an open grate. On building the fire in No. 1, the draft was excellent; in No. 2, not so good; in No. 3, bad, while in No. 4 the draft was all down the chimney. The chimney doctor put in an ap-

pearance with his patent back-action flue persuader, and applied one to the flue of No. 4, thus raising it three feet, and it worked well, but No. 3 smoked like a tar kiln. That was also doctored when Nos. 1 and 2 smoked, these were also fitted with a persuader, thus making all the flues of equal height and the result was they became as at the start, and the process of doctoring had to be done over.

VENTILATION OF CELLARS.

It is frequently desirable to ventilate cellars to remove heat or moisture. John P. Hawkins, Commissary of Subsistance of the U. S. Army, gives the following plan:

"When the outer air is warmer than the air of the cellar and it is desired to remove moisture or impure air, advantage should be taken of dry wind from a favorable direction. As about three to four o'clock in the morning it is generally the coldest this would be the most favorable time in warm seasons. Though simple openings at the top, opposite each other, might be sufficient for ventilation they will not arrest light. Tubes are therefore necessary. The inlet tubes should extend to the bottom of the cellar, with a close fitting cap at that end, for opening or closing. The upper end should extend horizontally with a hopper-shaped mouth, which can be turned so as to catch the wind from different directions. The outlet tubes should be placed at the top of the cellar wall, and not extend beyond the inner face. The outer end should extend upward and be provided with caps also. Both tubes may be fitted with cowls and vanes so as to turn the wind. All other openings to the cellar should be closed. The number of tubes necessary will depend on the size of the cellar, but they should not be less than ten inches in diameter each. Galvanized sheet iron is a good material for tubes, or they could be made of boards cemented with paint lead. If an outlet tube were carried up through the roof it would be better. A chimney flue from the cellar to the roof is a good outlet. The cooler the inlet current of air the more rapid the removal of moisture. To illustrate: If the outer air at a temperature of zero, and raised therein to 60°, be admitted to a cellar, it would absorb and carry off about five Troy grains of moisture per cubic foot; if raised to 100° it would absorb and carry off nineteen grains per cubic foot."

VENTILATION OF PRIVIES.

I do not know that I can add anything to the excellent method recommended by our civil engineer, Mr. Loring, for the ventilation of privies, as they are to be found generally in the State. On general principles I would say they should be located as far from dwellings, or habited buildings, as possible, and under no circumstances should they be placed within six feet of any dwelling or school building. The practice of placing privy vaults within the walls of a dwelling should be abolished. If, however, a vault must be placed contiguous to a dwelling it should be outside the walls of the dwelling, and from the vault to the roof it should be entirely separate. Ventilating flues should be placed from the vault to the highest point of the dwelling of an area of not less than thirty-six square inches, and increased with the size of the vault. Its lower end should open into the vault at the highest point at which the gases will have access to it. The flue should be made of galvanized iron or other metal, as the heat of the sun acting on it will create an upward draft inside the flue. It should be provided with a cap to prevent down drafts. The building over the vault should be provided with ventilation by lattice blinds. Every seat should have a cover, which should be kept closed.

School privies should be not less than fifteen feet distant from the building. The farther off the better. They may be connected with the building by a covered passage-way. It is usual to construct school privies double, with the seats back to back. The partition at the back should also be double and reach to the roof, with a proper space between to serve as a ventilator.

Outlets may be made in the roof, into flues extending upward, sufficiently high to carry the gases above the roof of the school building.

Each apartment should be ventilated by lattice blinds. The building should not be less than ten feet high to the cornice, and the flues should reach the height of the school building.

VENTILATION OF SEWERS.

The admission of gas from the sewer into a habited dwelling is to saturate the same with poisoned air. To quote from Sir Edward Philbrick: "The risks we incur by breathing sewer gas are too serious to be laughed at or whistled over. Common sense should teach us that an ounce of prevention is worth a pound of cure."

Following this idea, Charles F. Wingate, before a conference of the State Board of Health of New York, said: "The proper method to secure a free atmospheric current through house drains is by supplying foot ventilation close to the trap on the main drain."

This method is also indorsed by Hellyer in his work, "The Plumber and Sanitary Houses," in which he says: "The advantages of this second air pipe, or foot ventilation, are greater than will be conceded, except by those who have proved its value. A practical test of eight years upon soil pipes and slop sink waste pipes has resulted in every case with the utmost satisfaction. This air pipe at the foot of the soil pipe is extremely valuable, for by this means a constant change of air is taking place throughout the entire length of a pipe to render it wholesome and prevent any air becoming stagnant in any part of the pipe; for when the soil pipe is not in use, this second air pipe at its foot acts as an air inlet."

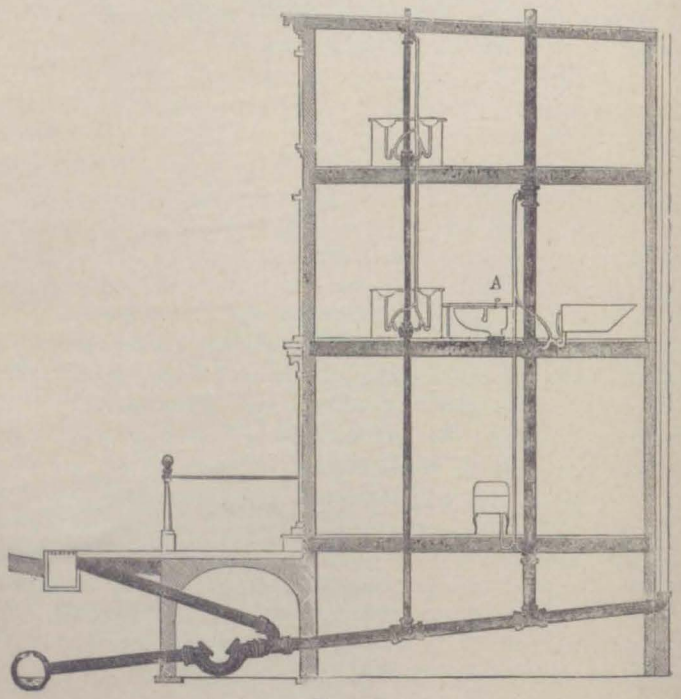


Fig. 8.

This plan is well illustrated by Fig. 8, for the use of which I am indebted to the courtesy of the Durham House Drainage Company, of New York, which also illustrates a most admirable and safe system of house drainage. The heavy or dark lines show a system of wrought iron pipes, with steam and gas-tight joints, precluding any escape of sewer air into the dwelling. There is an apparent error in the plan, evidently that of the plumber. The pipe A, from the bowl of the closet, should either go into a heated flue or be carried through the roof, independently, with a constantly burning gas jet inside of it, to insure draft up the pipe.

It will be noticed that this plan is similar in its operation to the plan of Mr. Wade, of Chicago.

The following requirements for house drains have been adopted by the best authorities of this country, and in several of the large cities:

"Every house drain should have an inlet for fresh air entering at a point inside the main trap, and carried to a convenient location out of doors not too near windows.

"A trap should be placed upon every main drain to disconnect the house from the sewer or cesspool.

"In places liable to unusual pressure from the sewer, it should be a double trap, with vent between the two traps running up full size above the roof; or, where the pressure from the sewer is only occasional, and the rigor of the climate will permit, the vent may be carried to the sidewalk or area at a safe distance from the windows.

"If the first trap is forced, the gas can gain easier exit through this pipe than through the second trap.

"Every vertical soil, or waste pipe, should be extended at least full size through the roof. No trap should be placed at the foot of vertical soil pipes to impede circulation.

"Traps should be placed under all sinks, basins, baths, wash-trays, water-closets, etc., and as near to these fixtures as possible.

"All traps under fixtures wherever practical, should be separately ventilated to guard against siphonage. Such pipes should not be inserted into a soil pipe below where any drainage enters it. In some cases it is preferable to carry it to outer air independently. Rain-water leaders should not be used as soil pipes, and when connected with house drains the joints should be made gas and water tight to prevent drain air entering the windows. No safe waste should connect with any drain, but it should be carried independ-

ently down to a point where its discharge would indicate the existence of a leak or overflow above.

"No waste from a refrigerator should connect with a drain."

The essential points of sewer ventilation are summed up by Mr. Latham in his book on Sanitary Engineering, as follows:

1. That the system should be simple in operation, not liable to get out of order, and independent of uncertain mechanic contrivances.
2. That it should admit of expulsion of all sewer air, and the supply of fresh air at all periods.
3. That the escaping gases shall be so diluted with atmospheric air as to be rendered harmless, or that they shall be "destroyed or arrested."
4. That the system shall not impede natural ventilation.
5. That it shall not be costly in execution or maintenance.

VENTILATION OF SCHOOL-HOUSES.

It has been variously estimated by different authorities that in early childhood from one fifth to one fourth of all the blood in the body is directed to the brain. The whole mass of blood traverses the entire body about once a minute.

The wonderful activity of the circulation may be better appreciated by estimates proportioned to greater lengths of time. It will appear, then, that the heart contracts more than four thousand times an hour, and that as each contraction sends forward four and two fifths ounces of blood, over one thousand pounds of this fluid pass through the heart every hour.

When the blood has completed one tour of the system it necessarily passes through the lungs before beginning another. This route is intimately connected with the purification of the blood. It is by this means the blood absorbs oxygen from the air, and parts with carbonic acid and other noxious elements.

Oxygen is the agent of nutrition to all the tissues; it is the great inciter of all vital changes, and its presence is indispensable to life and growth.

If the blood passing through the lungs does not there obtain a supply of oxygen it takes back to the brain and other tissues carbonic acid instead, and the consequences is an arrest of the changes necessary to life and growth.

If in passing through the lungs the blood meets with a small supply of oxygen, or that which amounts to the same thing, air surcharged with carbonic acid—a partial arrest of vitality takes place, the vigor of the organism is diminished, the functions are depressed, and there will be a gradually increasing torpor of the mental faculties and ultimately a stunted intellect and premature death.

A due supply of unadulterated air to the respiratory organs is recognized as among the most important conditions of health at all ages, and under all circumstances, but at no age is this so essential as in childhood.

Air vitiated by respiration, is not only known to be among the most active influences in promoting spread of many fatal diseases, but on young children who may escape these diseases it exercises a powerful depressing influence.

Very few school-houses in this State are so constructed as to supply pure air to the inmates. As a rule they are little else than hot-beds of disease.

With defective or no ventilation at all, they are overcrowded, on the apparent assumption that small children require only small breathing space.

According to the rule given in another part of this report the lowest estimate would require 300 cubic feet of space and twenty-five feet of floor for each scholar.

Thus a room 30x30 and 12 feet high might contain thirty-five scholars and the teachers, but this should only be used with good ventilation, a ventilation which would introduce 72,000 cubic feet of fresh air every hour, and change the entire air in the room six times an hour. How many school-rooms in Iowa of this size or any other are fitted to these conditions? Instead we find the scholars nearly double in number and little or no ventilation. Not only is the air in the room contaminated by respiration, but from organic particles thrown off from the unclean persons of unclean pupils.

A facetious professor of a college was wont to remark when a change of classes took place in his room: "Mr. Jones, will you please open the window and let the remains of the senior class out of the room." There was much scientific truth in his humor.

The actual "remains" of our bodies contaminate the air of our rooms more than is usually considered.

A thoughtful lady who had employed an engineer to provide ventilation for an orphan asylum, remarked to him: "I think we have

got to ventilate every child." This exactly expresses the idea of ventilation. Each child in a school-room should have their share of pure air and not after it has been breathed by some other pupil.

The methods to produce this result are numerous. But whatever method be applied it should be automatic and never dependent upon the action of any person. And in this connection heating is so closely identified, that it is inseperable from it. This applies to colder seasons. In summer there is very little need to resort to artificial ventilation; open doors and windows will give the necessary supply of air.

Heating is usually secured by an open fire, steam coils, stoves or radiators and furnaces. Stoves are objectionable because the radiation of heat is limited to a small area, and too frequent tending to heat a large area with a small stove, kept at red heat. Steam coils as commonly used are objectionable, because there is seldom any method supplied for renewal of air in the room. Furnaces properly constructed are the most desirable, because by their use ventilation must be more or less secured.

The tendency is to too small heaters and they are therefore like stoves kept red hot, thus supplying a noxious and poisonous air. If a furnace is used it should be large, so as to supply abundance of air moderately heated.

After a somewhat extensive examination of different writers on the subject, I have found none which impresses me more favorable than the views of Dr. R. C. Kedzie, President of the American Health Association, who is a teacher of many years' experience, a profound thinker, and who has devoted much time and observation to the subject.

He says: "The air ducts should be abundant and kept out of sight. This may be done by using the space between the joists underneath the floor, which may be provided for in the original plan of the building. It is often impossible after a building is constructed, as the position of the joist will not permit it. The ducts should lead to a ventilating shaft which should be within the building, the center if possible, in order to secure so high a temperature in the shaft as to insure motive power enough for ample ventilation by the waste heat of the furnace.

It should be of sufficient size, but not too large. If too large there is danger of return currents of air by the side of the shaft.

The size of the shaft may be easily estimated by the rule adopted in the British army, viz.: ten square inches of sectional space for each person. In this shaft I would place the pipe to convey away the smoke from the furnace, and thus utilize the waste heat to warm the shaft.

To preserve the air of a room in such a state of purity that the carbonic acid shall never exceed eight parts in each 10,000 of air, 2,000 cubic feet of air must be admitted for each person in the room. In a room 30 x 30 x 12 and containing thirty-six persons, 72,000 cubic feet of air per hour must be introduced, and the entire air of the room changed six times an hour. If we allow ten square inches of sectional area in ventilating shaft for each person, this number of scholars would require a ventilating shaft 19 x 19 inches; the air must move through it at the rate of five and one half miles an hour; if the shaft is twenty feet long it will require a permanent elevation of temperature 15° above outside air.

In order that each room may receive its own share of ventilation, and to prevent the foul air of the room from being driven into another room when high winds prevail, I would divide the shaft space outside the smoke pipe into two or four shafts by having two or four plates passing the whole length of the smoke pipe radiating till they strike the sides of the shaft.

These long radial plates can be riveted to the sides of the smoke pipe, and at their other edge be imbeded in the brick work of the shaft, equal in size and aid each exposed to the same amount of heating surface in the smoke pipe. If properly constructed these air spaces will not communicate with each other, but perfectly independent shafts throughout. It will, therefore, be impossible for one of these shafts to rob or interfere with the action of another.

One of these shafts may be devoted to ventilating one room or floor, and the others for the other rooms.

Into these ventilating compartments of the main shaft the foul air ducts enter at once from the floor level of the room to be ventilated. The smoke pipes should be from twelve to sixteen inches in diameter to insure the perfect removal of all smoke and the product of combustion, and also to afford heating surface to the shafts.

By a little skill in the arrangement it will be easy to heat this central pipe by a small stove in the basement in the summer, and thus

secure good ventilation in the hotest weather, without warming the building in the least.

The inlet ducts to admit fresh air, whether hot or cold, should have the same sectional area as the outlet ducts for foul air, viz.: ten square inches for each person. The general practice is to make these tubes for admitting warm air much too small, and to admit the air at a very high temperature—that is, a small amount of hot air instead of a large amount of warm air. The air should never be admitted above a temperature of 145 degrees.

The air-shaft should be plastered smoothly inside its entire length. If the space between the joists is used as a foul-air duct, the foul air of a room should escape through openings in the floor.

Dr. Kedzie holds that "it matters not whether fresh air is admitted at the top or bottom of a room; but foul air should be withdrawn from the floor;" but the New Jersey State Board of Health says: "Air should not as a rule be admitted near the floor level, as the openings are liable to get fouled by floor sweepings."

The air should be admitted above the level of the heads of persons occupying the room, and directed toward the ceiling.

This plan may be admissible where heating is done by steam coils; but would be unwise where a furnace in the basement is used for heating the cold air at the bottem of a room. How would pupils warm their feet if the heated air was admitted four feet from the floor?

There is no system which works well in all weather and at all temperatures, without the aid of power to carry off the foul air. In cold weather there is no difficulty, but in mild, heavy or muggy weather, some power is absolutely necessary.

Various methods have been devised as whirligigs on top of the ventilator, iron smoke-stacks in the center of the shaft, small steam coils, or a small gas-stove at the bottom of the shaft. Most excellent results have been obtained from a small gas-stove. It requires only the quantity of gas consumed by a single ordinary burner. The gas often being thoroughly mingled with atmospheric air, is passed through wire gauze and burned above the netting. Diverse opinions prevail in relation to the place for withdrawing foul air, whether at the top or bottom of the room.

The most satisfactory results will follow where large registers are

FIG. 9.

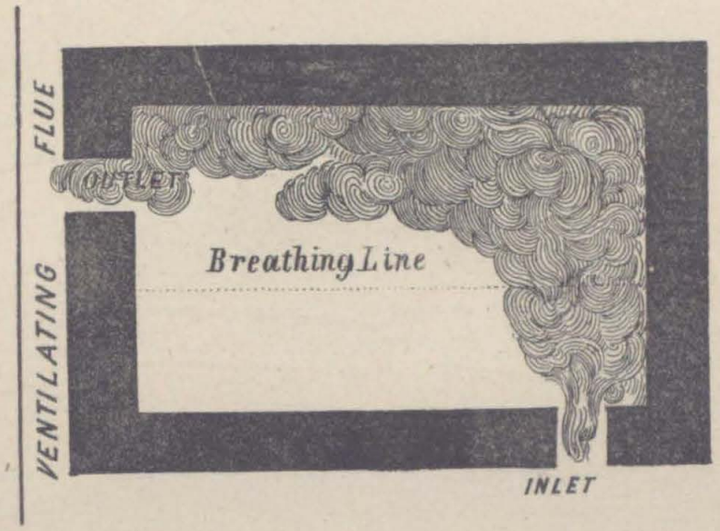


FIG. 10.

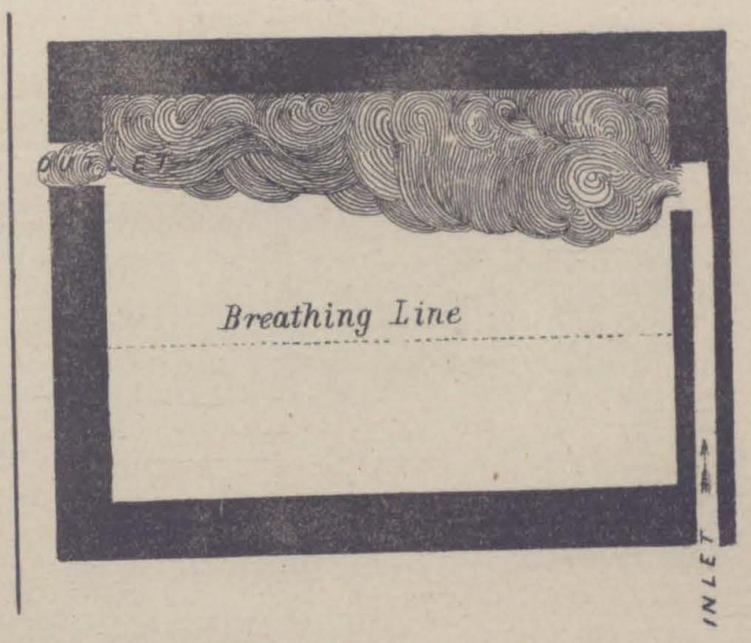


FIG. 11.

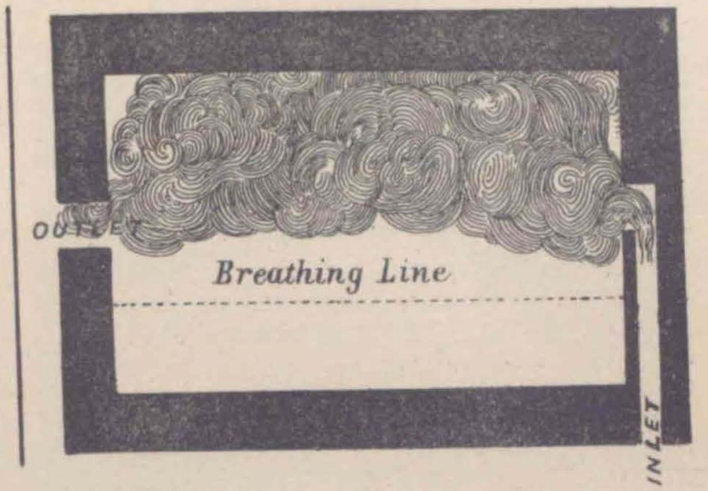

OUTLET
Breathing Line
INLET

FIG. 12.

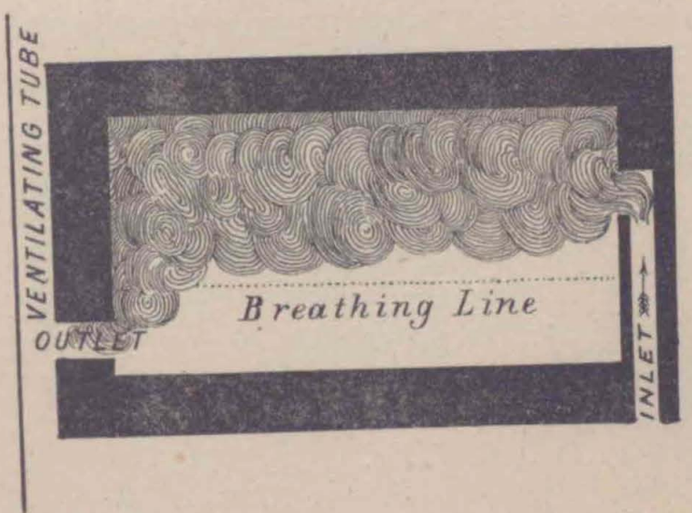

VENTILATING TUBE
OUTLET
Breathing Line
INLET

FIG. 13.

FIG. 14

arranged both at the top and bottom of the room. After the rooms are properly aired in the afternoon the upper register may be closed until the next morning at nine o'clock and then opened and remain so during school hours. The lower register may remain constantly open.

After arranging for the reception through the pipes and registers in the school-room of an abundant supply of fresh heated air and for the carrying off of the impure air by ventiducts, then heat the corridors, passage-ways and entries, and leave all doors open into these corridors from the school-rooms and thereby permit a general circulation of air from the several rooms to the corridors. It will facilitate very much if hot air be poured into these corridors at the foot of the lower staircases and a large ventilating pipe pass out through the roof from the upper hall of these corridors. By these means a draft throughout the building is promoted and that without the deleterious effects always produced by opening windows and allowing a draft of air to blow directly upon the heads of pupils.*

A. C. Martin, architect of Boston, who has devoted much time to school-house ventilation says, "Foul air should be taken out by small openings around the bottom of a room." Fresh air should be admitted near the top and be directed upward and along the ceiling. The foul air ducts should lead to a large central shaft which should be heated by some means at the bottom."

Warren R. Briggs, an eminent architect of Bridgeport, Conn.,† says: "It being admitted that steam is the universal medium for heating school buildings, the question is how it shall be used, whether by radiators in each room or by radiators in boxes in the basement, the heated air being carried to the rooms in pipes."

From observation and practical experience he is in favor of the latter, if the apparatus is properly arranged and understandingly heated.

He gives the following illustrations of the different methods of placing the inlets and outlets where indirect heating is used, and their effect on the movement of air in the rooms.

See Figs. 9, 10, 11, 12, 13, 14.

Of these various methods of ventilation, that illustrated in figure 14 is the best. The air enters the inner corner of the room about eight

* Rhode Island State Board of Health Report, 1879.
†Connecticut State Board of Health Report, 1879.

feet from the floor, in a room twelve feet high, or two thirds the height of the room. The outlet is placed directly under the inlet on the floor level. A platform on casters is placed over the outlet, 6x12 feet. This may be used for the teacher. Its lower edge should not be less than four inches from the floor. This will give full circulation of air under it. If on casters it can be easily moved away to sweep the dust and dirt from under it.

The movement of air is rapidly upward and outward. Stratifying currents go toward the cooler outer walls, thence flowing down their surfaces to the floor and back across the floor below the breathing line, or heads of the pupils, to the outlet. Thence the air traverses the entire room with a circular motion, and there is constant mixing of air in all parts of the room. If the inlet and outlet pipes are properly balanced there will be very little loss of heat.

The inlets are all intended to be large, and the flow of air through them moderate and steady. The air is not intended to be heated to a very high temperature; the large quantity introduced is expected to keep the theremometer at about 68° at the breathing line. The estimate is to supply each pupil with thirty cubic feet of air per minute, or 1,800 cubic feet per hour.

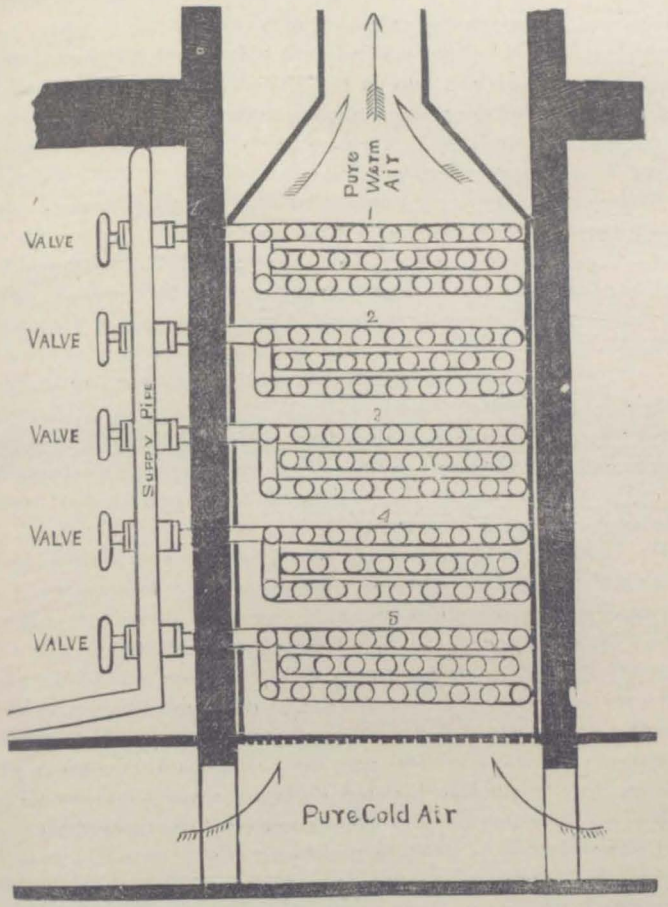


Fig. 15.

Trouble has always been found in regulating the supply of warmed air obtained by the indirect system, owing to the inability to control the heating surfaces. This may be obviated by enclosing the heating surfaces for each room in separate cases or jackets. These may be subdivided into five sections (see Fig. 15), so arranged that any number of the sections, or all of them may be used at discretion, thus graduating the heat to the condition of the weather. Thus, while

the supply of air remains the same, the degree to which it is heated is changed by the opening or closing of a valve.

A committee to whom was referred plans from which to select models for school buildings in the city of New York, made their selection, awarded the prizes according to the conditions of the prize giver, and then declared that none of the plans fulfilled the requirements of a sanitary school building.

The committee says: "A school building should possess the following qualifications when built in a city:

"1. It should be freely exposed to air and light, and should be not less than sixty feet distant from any opposite building.

"2. Not more than three floors should be occupied for class-rooms.

"3. In each class-room not less than fifteen square feet of floor area should be allotted to each pupil.

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

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

"6. Ventilation should be such as to provide for each person in a class-room not less than thirty cubic feet of fresh air per minute, which amount must be thoroughly distributed without creating unpleasant drafts, causing any two parts of the room to differ in temperature more than 2° F., or the maximum temperature to exceed 70° F. This means that for a class-room to contain fifty-six pupils twenty-eight cubic feet of air per second should be constantly furnished, distributed, and removed during the school season. The velocity of incoming air should not exceed two feet per second at any point where it is likely to strike on the person.

"7. The heating of fresh air should be effected either by hot water or low pressure steam.

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

"9. The building not occupy more than one half the lot."

This committee was composed of George R. Post, architect, New York; John S. Billings, Surgeon United States Army, and Vice-president of the National Board of Health; Hon. John D. Philbrick, United States Commissioner of Education at Paris and Vienna Exposition; Wm. R. Ware, Professor of Architecture, Massachusetts Institute of Technology; certainly men of authority and capability.

It would be wise to heed their advice and provide school-houses with sufficient light and ventilation, rather than turn loose crammed, near-sighted, round-shouldered boys and girls, with no health or disposition to work.

At the Centennial Exhibition at Philadelphia was shown a "model school-house," which had been approved and adopted by the government of Belgium. It received marked attention from those interested in educational subjects, and I therefore present the methods provided for ventilation:

1. The surbase was set off from the wall about four inches all around the room, thus forming an air space which was covered with perforated zinc. Several openings about eight inches square were made from this space to the outside. These openings were provided with hinged covers, to be opened or closed at pleasure; the air enters these openings, strikes the surbase, and is reflected upward into the room through the perforated zinc.

2. The lower sash of the room was fixed; the upper sash was hung on hinges at the bottom, and arranged so as to drop inward at an angle of thirty degrees or less, at will. The air entering the room strikes this inclined sash and is reflected upward to the ceiling, thus preventing direct draft upon pupils.

3. The stove received the air necessary to support the combustion of fuel, through openings in the floor.

4. The foul air was carried off through registers in each corner of the room, connected with flues under the floor, each flue forming a junction under the stove and connecting with a single flue in the stove, which passed through the roof. This flue was placed alongside the hot air flue in the stove, which created a heat and drew the foul air upward. A space was made around the ceiling of each room similar to that below at the surbase, and covered with perforated zinc. This space communicated with the outside air by pipes at each corner, eight inches in diameter, capped with an elbow and vane so arranged that the mouth of the cowl would be turned from the wind. This would cause a draft which would draw the foul air from the upper part of the room.

These plans of ventilation apply to large school-buildings, usually found built in cities and large towns. The large majority of our

school-buildings are of one story and heated by a stove. To properly ventilate such is a difficult matter, yet much may be done to secure good ventilation in such buildings. A. C. Martin, an architect of Massachusetts* has devised a plan which has been improved by Dr. Kedzie, and is shown in the diagrams Figs. 16–17.

The air to supply the lower room enters by the air pipe marked *a*, Fig. 16–17, passing beneath the floor and opening under the stove, *b*, around which is a galvanized iron jacket entirely surrounding the stove, (recessed for the stove door) and rising up as high as the top of the stove. The space between this jacket and the stove is one foot on all sides. The cold air as it enters is thus warmed by the stove before reaching the inhabited part of the room. The scholars sitting near the stove are screened from the excessive heat of the stove by this jacket.

The foul air is drawn off by the foul air ducts, *f. f. f. f.*, these ducts being formed by the spaces between the joists which run lengthwise with the body of the house, while the joists in the vestibule run at right angles to these. The direction of the foul air is indicated by the arrows at the floor level. The foul-air flues all terminate in the front half of the ventilating shaft, *d*.

The straight arrows in the vestibule show the direction of ascent up the stairs.

In the vertical section, Fig. 17, the letters have the same uses as in the ground plan. As it is essential that the ventilating shaft should be carried up some distance above the ridge of the roof, and as there is not room on the page to carry the shaft to the required height, and to represent the cowl on the top, the roof is cut away in the plate, and a break in the shaft indicates the incomplete extension of the shaft.

The position of the stove in the upper room is not indicated, but it has the same position, and is supplied with air in the same manner as the stove in the lower room.

The foul air of the upper room is drawn off by foul air-ducts exactly corresponding with those in the lower room, except that they all enter the compartment *c*. in the ventilating shaft. For successful ventilation it is essential that the foul air of each room shall enter a separate compartment in the ventilating shaft, and not one common shaft. These separate compartments are secured by having vertical

*Mass. Report of State Board of Health.

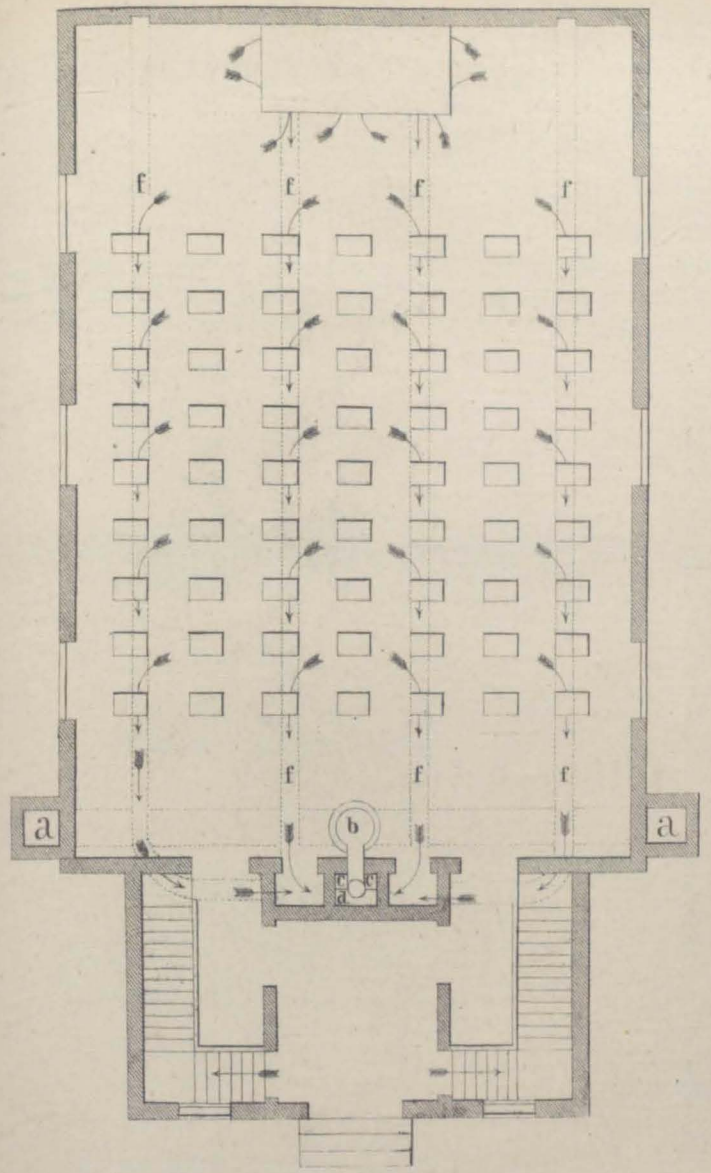


Fig. 16.

Fig. 12.

iron plates passing from the smoke-pipe to the interior surface of the shaft, where they are imbedded in the brick work. In this way two or more ventilating shafts may be made, with the smoke-pipe as their center, and all warmed by the waste heat of the smoke-pipe; these ventilating shafts having no communication with each other through out their entire length.

By placing a small stove in the bottom of the ventilating shaft (in the basement), the smoke-pipe in the center of the ventilating shaft can be heated and the ventilating system kept in active operation without warming the school-rooms, even in the hottest weather.

The fresh air flue, *a. a.* is represented double, so that fresh air can be secured, whatever is the direction of the wind. Each extremity of the fresh air flue should be provided with a valve to open or close the flue, and thus regulate the influx of cold air, even when very high winds prevail. The handles of these valves will be in the school-room, so that the teacher can open or close the valves, and thus control the flow of air without leaving the room. The teacher alone should have control of these valves. The air to feed the fire in the stove should be drawn from the school-room, and thus assist in ventilating the room.

There is still another class of school-buildings in the rural districts already constructed, which have no appliances for ventilation. In such very much may be done by the teacher. Rooms should be thoroughly flushed with air before and after school.

This may be done by lowering windows and opening doors. When the room is closed a strip of board two inches wide and the width of the window in length may be placed on the window sill under the sash. This will leave a space between the upper and lower sash through which outer air will enter the room. The stove pipe opening the chimney will furnish a good outlet for bad air.

Every school-house of one story could be supplied very cheaply with fresh air, by an air duct leading from the outside underneath the floor to the space underneath the teachers' rostrum, and through perforations made in the base-boards, or riser of the rostrum. It would be much better to enclose the stove in a sheet iron jacket rising above the stove, and have the air ducts extend underneath the stove, where holes in the floor could be made for the air to pass up between the jacket and stove, and thus become heated in winter.

H. A. Robinson's ventilator placed in the upper part of the room and carried out through the roof will also provide a good ventilation by admitting fresh air on one side of the ventilator and carrying off foul air on the other. Where this is used the stove may be surrounded by a jacket. A coal stove may be jacketed as well as a wood stove.

Dr. D. F. Lincoln, in his paper on "School Hygiene," published in the Second Annual Report of the Now York State Board of Health for 1881–2, gives a very simple method of utilizing common stoves for heating and ventilation, which was reprinted in the Sanitary Engineer January 25, 1883, the publishers of which have kindly loaned the cuts herewith to illustrate this plan.

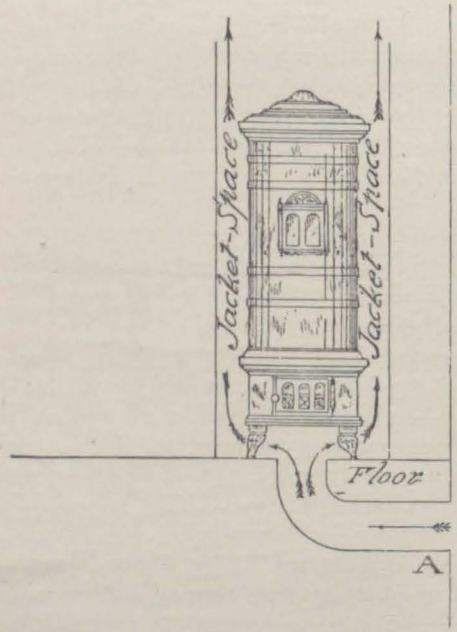


Fig. 18.

Fig. 18 shows how a "jacket" may be used. It is a metal cylinder or casing of sheet iron considerable larger than the stove, placed around the stove, its lower edge fastened to the floor. A good sized pipe is carried through the floor under the stove, and led through the house wall at A. Guard the inlet at A with a screen to keep out paper and other sweepings, and a large supply of pure warmed air is drawn into the room. This is one of the cheapest and best devices for heating and ventilating. Some prefer to extend the jacket around only a part of the stove and leave the door uncovered; or the jacket may stop at the bottom of the stove, and be made fast to the latter at that point. This arrangement is equivalent to a portable furnace such as is usually placed in a cellar or basement.

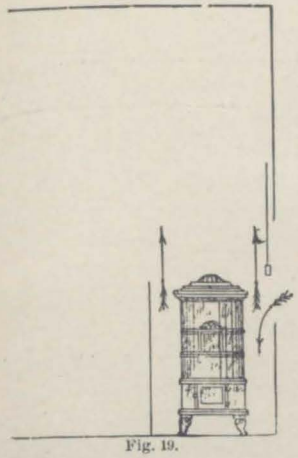


Fig. 19.

Fig. 19 represents a stove standing close to an open window. The movable semi-cylinder of metal used for a screen, has been so placed as to enclose the stove on all sides, except that toward the windows. Cold air may then be admitted. It is quickly warmed by contact with the stove, and is thrown upward with the general current.

Fig. 20 shows air brought in so as to be warmed by contact with the stove-pipe. The inlet flue is enlarged and runs up with the stove-pipe like a jacket for some distance.

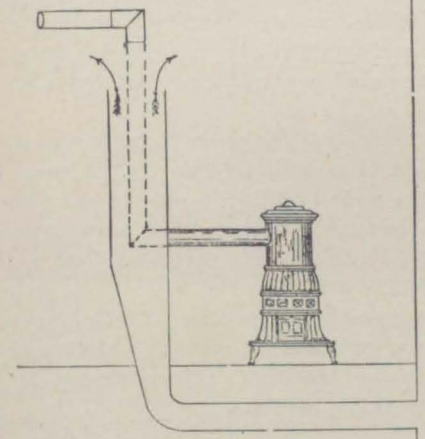


Fig. 20.

Fig. 21 shows how a stove-pipe may assist in removing injurious air. The diagram represents a two-story house with a chimney which comes down only a short distance from the roof. The opening into the chimney for the stove-

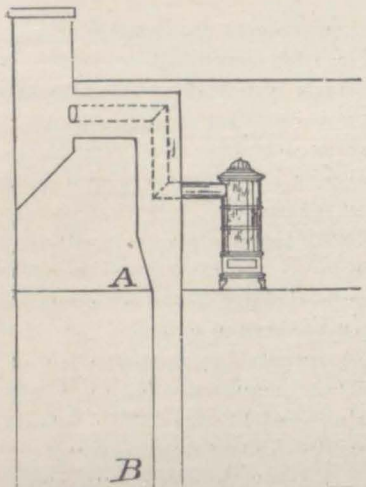


Fig. 21.

pipe is enlarged so as to receive a much larger pipe, which encircles the stove-pipe like a jacket. This jacket may stop short at A, or may be carried through the floor to B, in the first story. It will secure a draught in either story as may be arranged. The idea of this plan was borrowed from an article in the Michigan Board of Health Report of 1879. A chimney into which a smoke-flue discharges may be opened at any point *below* and not too near the point where the smoke enters. Where a chimney reaches to the floor, and the stove-pipe enters near the ceiling, the chimney ought to lend its powers to the task of ventilating the room by an opening near the floor. This opening should be closed when starting the fire in the room.

It is not often convenient to obtain an analysis of the air in a room, so as to ascertain the amount of carbonic acid therein. A simple and very efficient test may be made by filling an ounce bottle with pure rain water, take it into the room to be tested and pour out the water. The bottle will then fill with the air in the room. Pour into the bottle half an ounce of clear lime-water and shake thoroughly. If it remains perfectly transparent, with no trace of milkiness or turbidity, it does not contain more than eight parts of carbonic acid in 10,000, and the air in the room is healthful. This test is given by Dr. Angus Smith, in his work on Air and Rain.

COAL MINES.

The increasing business in mining coal in this State requires some attention to the ventilation of mines. But two methods are generally adopted. The fan, and heat. The former of which has been long in use in Great Britain, is coming into favor in this country. But in both countries heating is generally adopted, because of the cheapness and certainty. Air on being heated expands one four

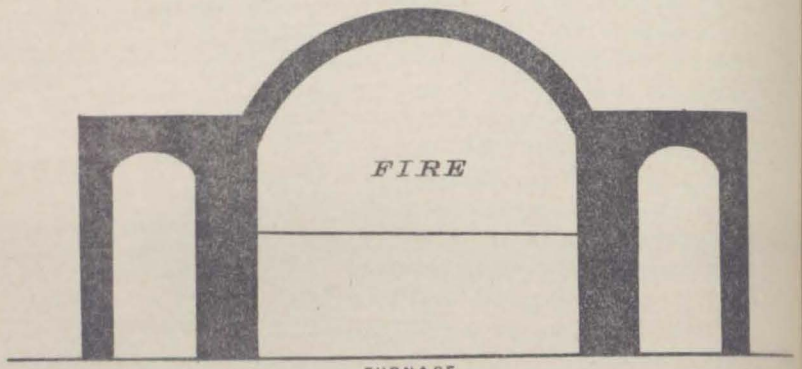


FIG. 22.

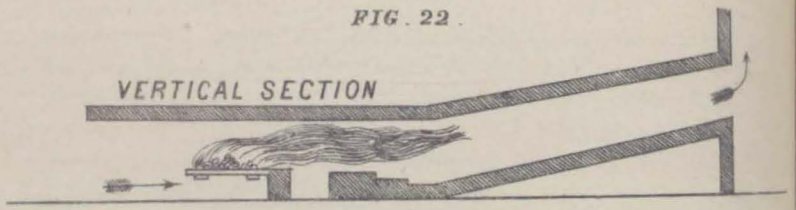


FIG. 23.

hundredth and fifty-nine parts of its volume for every degree of heat applied to it 1,000 cubic feet of air at a temperature 32° F, expands to 1,336 cubic feet when raised to a temperature of 212°.

The heated, expanded air becoming lighter bulk for bulk flies upward, while the cool, heavy air presses down too rapidly to the place of the ascending column. When heat is constantly applied there is constant motion of air. This is the principle of furnace ventilation in mines.

The larger the column of heated air in a shaft, the greater the velocity of the current. In his practical treatise on mine ventilation, Atkinson says: "Where furnaces are used to produce ventilation, the deeper the upcast shaft, the better, because it gives a larger column of hot air, and causes greater ventilating pressure."

Roy in his treatise on coal mines, says: "The ventilating exhaust fan is at the top of the upcast shaft for the furnace at the bottom of the shaft. It should be placed back from the bottom of the upcast 100 or 150 feet to avoid setting on fire the woodwork of the shaft. The passage way from the furnace to the air shaft should slant upward if it can be done and should be of the same area as the air shaft, and both should be proportional to the size of the furnace. A large furnace and upcast shaft with narrow airways or spacious airways with small furnace and upcast, cannot produce good results."

When the air courses are thirty-six feet of sectional area the furnace should be six feet wide and three feet high above the bars. A wide furnace will do better service than a high one of the same sectional area, because it admits of a thin fire, which more effectually heats the passing column of air. [See Fig. 23.] The upcast shaft need not be as large as the airways, as the sides of the shaft in too large an upcast do not become sufficiently heated, and a small shaft confines the ascending column too much. For a six feet furnace, and thirty-six feet airways, an upcast of twenty-five to thirty feet of sectional area would approach perfection.

The upcast shaft should be free from falling water to insure which it should be lined throughout with non-combustible material.

Great caution should be had to guard against the possibility of setting the coal pillars on fire. This is done by building a brick wall on each side between the furnace and pillars. If the roof is fragile, this wall should be made the support for the roof. No prop, wood or combustible material should be used near the furnace. No money is

lost in the construction of a good safe furnace. Air in its passage along the galleries of a mine is retarded by the friction from rubbing against the sides, roof, and floor of the mine.

The smaller the airways, and the farther the air has to travel the greater is the friction to which it is exposed; hence, large airways move more air with the same ventilating power than small ones; also, short airways with the same ventilating power cause a brisker flow of wind than long ones. It is sometimes impossible to enlarge an air shaft to meet the requirements of a mine.

An increased quantity of air may be had by splitting the circulating stream. The advantages of splitting the air are shown by Mr. Atkinson* to be thus with a constant ventilating pressure: 7.288 cubic feet in one column will produce 66.667 cubic feet, in five equal and similar parts; 103.280 cubic feet, in ten equal and similar parts; 111.421 cubic feet, in fifteen equal and similar parts; 113.704 cubic feet, in twenty equal and similar parts.

With constant ventilating power 16.198 cubic feet in one column will produce 70.844 cubic feet in five equal and similar parts; 94.850 cubic feet, in ten equal and similar parts; 99.772 cubic feet, in fifteen equal and similar parts; 101.132 cubic feet, in twenty equal and similar parts.

"Although every split adds to the total quantity of air in circulation, still in each separate split the quantity ultimately becomes less and less, and if the number be too great, the air current becomes too feeble and slow to sweep into the holes and corners, driven in advance of the actual current, and besides the powder smoke is a longer time in being carried away from the workman. Still it is a fact, additional quantity of air is obtained from every new split made."

Another advantage of splitting is in case of explosion by fire damp, the force of the blast is confined to the district where it occurs.

"Every split of the downcast," says Roy, "should be made as near the bottom of the downcast as possible, and no two or more splits should be allowed to reunite until they have returned by independent routes toward the bottom of the upcast."

By constructing overthrows in the mine so that one current can pass over another without coming in contact; and by placing regulators in each separate air course so as to give each division of the mine

* Transactions Northern Institute of Mining Engineers, vol. 3.

its proportional share of the main current, many a dangerous and fiery mine is made safe and healthy.

The absence of fire damp in a mine is too often taken as a license to neglect ventilation. This is mistaken economy. The foul air not only prostrates the energies of the miners, but it has an injurious effect on the prop-wood and other wood work of the mine.

As the result of numerous tests, Mr. Mackworth, inspector of mines established the fact that men in a well ventilated fire-damp mine do more work than those in mine in which no fire-damp existed, but which was badly ventilated. The estimate is one fourth additional labor performed. The amount of air required for the thorough ventilation of mines is given by some of the ablest mining engineers of Great Britain, to-wit: Prof. Philips: in mines which yield fire damp abundantly, 600 cubic feet of air per minute for each miner, and 200 cubic feet for each area of waste. Mr. Blackwell gives from 250 to 500 cubic feet per man according to the requirements of the mine. Mr. Hedley, mine inspector: From 100 to 500 cubic feet per minute per man. Mr. Taylor, mining viewer: With no fire-damp 160 to 200 cubic feet per minute per man. Mr. Mackworth, mine inspector: With no fire-damp and little mineral gas, 100 cubic feet per minute per man. Mr. Smyth: With no fire-damp 100 cubic feet per minute per man; if fire-damp is given off, at least 3,000 cubic feet of air per minute would be required to dilute, or 6,000 cubic feet in addition per man. Mr. Dunn, inspector of mines, fixes 10,000 to 15,000 cubic feet per minute as the minimum per man for the most harmless mines.

The laws of Pennsylvania require not less than fifty-five cubic feet per second shall be circulated to the face of each and every room per man.

The laws of Ohio require 100 cubic feet per minute per man.

No standard is fixed by the statute of Iowa, it being left to the discretion of the State Mine Inspector, except that it shall be abundant for each person.

As a measure of self protection from fire-damps a barometer should be fixed in all mines where there is an escape of this gas, as it will quickly be indicated by the falling of the mercurial column.

The great majority of mine explosions occur during a low state of the barometer, and the more sudden the fall of the mercury the greater the danger of explosion. The thermometer will indicate the temper-

ature in the rooms, or upcast and downcast shafts, so as to show the pressure from the ventilating power. The quantity of air in the currents may be measured by an anemometer of which there are several patterns, though Biram's is generally adopted in Great Britain and in this country. It is simple and self-registering. Any slackening of the volume of air by defect in the furnace or obstruction of the airways is at once shown by the anemometer.

The numerous accidents from powder eqplosion in mines and consequent great loss of life has led to experiments to procure substitute for that villanous compound. On the 20th of August last a series of interestin, experiments took place in the workings of the Wharncliffe Silkstone Collieries near Sheffield, England, the object being to test a new method of mining coal by the use of compressed lime instead of blasting powder.

The experiments which were witnessed by the officials of this and other collieries took place in the Parkgate Seam. A hole about three inches in diameter and four feet deep was drilled through the solid coal and cleaned out, a perforated iron tube was then inserted, and the lime cartridge three inches long put in. When the lime had been rammed home and the hole made up a force pump was used to inject water into the bottom of the tube. Simultaneously with the injection of water the rending process began, and in about thirty minutes about ten tons of coal came down almost in an unbroken mass. Of the whole of the fall not more than six per cent of the coal was small, a much smaller percentage than under the old system.

It is anticipated that compressed lime will eventually supercede the use of blasting powder, and thus revolutionize the system of mining coal.

RAILROAD CARS.

It may seem an absurdity to say anything upon railroad car ventilation, but when we consider the millions of people who travel it becomes important. It is true there is in a majority of cases but a brief occupancy of a car, yet there are vast numbers who spend hours and days in cars. It therefore becomes of great importance. I need not recount the important features of riding in a railroad car, the bad air, oppressed breathing, hot, heavy, aching head, cold feet in winter, dust and stench in summer.

It is not surprising, with sixty persons crowded into a space healthful only for four, one should become wearied and exhausted by even a short journey. If you open a window in winter a freezing draught is the result; in summer it is dust, cinders, and dirt. To open a door only increases the evil. How to remedy it is a problem not yet solved, though various plans have been tried, some of which work well when the car is in motion. Recently a mansard roof has been added to coaches, and on the sides small hinged windows have been placed ostensibly for ventilation, but they are a delusion. The average brakeman, to whose care they are entrusted, has as little conception of their proper use as he has of anything else of which he knows nothing. There is little hope of securing proper ventilation of cars by the action of any board of medical directors, because of the inevitable expense. It must be automatic and not dependent upon any employe of a train. No system can probably be devised which will properly ventilate a car when at rest, and certainly none when a car is in motion, unless the windows are made fast; and what would the average woman who travels do, if she could not hoist a window the moment she took her seat in a coach?

CONCLUSION.

I have endeavored to give herein the best authority attainable on the subject of ventilation. To attempt to decide as to the best method would be an absurdity. But one fact is settled beyond a question or difference of opinion: good ventilation costs money; that in this climate there cannot be had thorough ventilation, good heating, and cheapness; that one method of ventilation will not answer for all buildings.

I am satisfied from observation that very few architects are capable of devising plans for perfect ventilation, for the reason that they know nothing of the physics of gases. They provide inlets and outlets for air, and methods of heating. If the ventilation is not what you expect, and you complain, he will probably recommend the "Automatic Zephyr Ventilator Cap," the "Eureka Pulsifier," the "Sanitary Grate," the "Foul-air Exterminator Stove," or some other patented contrivance, to supplement his ignorance. And he will send you a host of recommendations with them, but not one of them will present the air analysis for the invention, without which they are not worth considering for a moment. There is everywhere in dwellings,

public halls, churches, and workshops, a lamentable disregard of ventilation, while extravagant expenditure is made for adornment.

I am here forcibly reminded of the Lime Kiln Club, who had the subject before them for elucidation. The committee on primary causes and past experience, to whom was referred the subject: "Do we ventilate enough?" reported that they had inspected over forty different houses occupied by colored people, and had discovered that fresh air was the last thing thought of by the inmates. In one house there was seven children, four dogs, a sick cat, a pile of rotten potatoes, a pile of bones, and a lame goose, and the only means of admitting fresh air was through bullet holes in the door. The committee recommended that every colored family provide themselves with plate glass windows, grates and mantles, and fan lights over all the doors. The report was accepted and *adopted*.

HOSPITALS

FOR

CONTAGIOUS DISEASES,

AND

THEIR PROPER LOCATION.

A PAPER PREPARED BY REQUEST FOR THE STATE MEDICAL SOCIETY, AND PRINTED HEREIN BY ORDER OF THE STATE BOARD OF HEALTH.

HOSPITALS FOR CONTAGIOUS DISEASES.

THEIR PROPER LOCATION, CONSIDERED MORE ESPECIALLY IN REGARD TO THE SAFETY OF NEIGHBORING DWELLERS FROM THE INFECTION OF SMALL-POX.

No one doubts the great usefulness of these institutions, which, for brevity's sake, shall be called in this paper by the old and significant, but objectionable, name of pest-houses. But when it comes to their location, especially in the suburbs of one of our rapidly growing towns or cities, a very vexed question arises.

The question has two very different aspects, according to the different stand-points from which it may be regarded. Sanitary authorities, and physicians generally, having no great dread of small-pox, partly from professional habit and familiarity with the disease, but mostly from an abiding and invincible faith in the entire protection afforded by vaccination, would place the pest-houses as near as possible, both for their own convenience in visiting its inmates, and for the superior facility and safety of the transportation of the latter. On the other hand, the community generally, having a superstitious horror of the disease, and being conscious, in many instances, of their neglect of vaccination, or, if vaccinated, doubtful of its protective powers, would wish the pest-house to be as far out of the city as possible, both on account of safety of persons and of the injury to the value of property.

Just what is the limit of safety to surrounding dwellings from infection by small-pox has never been definitely settled either by experiment or observation. In Johnson's Cyclopædia it is stated that persons have been infected by the "volatile contagion" across a river 150 feet wide. This fact, if it is indeed a fact, has been quoted in a judicial decision in this State. But the medical mind,

by general consent, has been always inclined to reject all such suggestions of infection through the air at long distances, and account for these apparent cases, or attempt to account for them, by some kind of actual material contact or contagion, an explanation so far fetched in many cases it must be admitted, as to require for its admission fully as much credulity or imagination as the other.

But now, fortunately, we are in the possession of such well observed and well authenticated facts, as to be able to make a considerable advance in the solution of this vexed question, but with the result of a great disturbance, if not entire overthrow, of current medical opinions.

For a proper understanding of the subject, it may be proper to call attention to the peculiar virulence of the small-pox contagion, which seems to be almost *sui generis*, having no like or companion.

"The poison of typhus exanthematicus is very readily got rid of by free ventilation, by means of which it must be at once diluted and oxygenated, so that a few feet give, under such circumstances, sufficient protection. This is also the case with the poison of oriental plague, while, on the other hand, the poison of small-pox and scarlet fever will spread in spite of free ventilation, and retain their power of causing the same disease for a long time."—*Parke's Hygiene*, 5th ed., p. 117.

This fact of the superior virulence of small-pox, even over scarlatina, will be more apparent further along when the recent observations in England, on a most extended scale, are narrated, which show that a space of as little as forty feet is sufficient protection against the poison of all diseases usually isolated in hospitals, with the sole exception of small-pox.

OBSERVATIONS IN ENGLAND IN 1880–1.

In 1880, by order of the Local Government Board (which is the English National Board of Health), Dr. Thorne made a series of observations, which were extended into 1881, upon the "Use and Influence of Hospitals for Infectious Diseases." When Dr. Thorne's inquiry was planned, it was not intended that it should extend to the metropolis. But at the end of 1880, when Dr. Thorne's inquiry was in an advanced state, representations were received by the Board that cases of small-pox were occurring in an exceptional fashion round certain of the metropolitan asylum board hospitals; and it was

felt that Dr. Thorne's experience on this subject derived from hospitals in the provinces ought not, without further inquiry, to be accepted as representing the whole truth for hospitals in London.

Accordingly, Mr. W. H. Power was associated with Dr. Thorne for the particular purpose of examining the facts for the neighborhood of Fulham Hospital.

INFLUENCE OF URBAN AND SUBURBAN, OR RURAL HOSPITALS OUTSIDE OF LONDON.

As to Dr. Thorne's report, the following facts are deduced:

1. Of the 286 hospitals in England for infectious diseases, 67 were inspected, in use by urban, by rural, and by port sanitary authorities; of every variety of locality, size and construction; some thoughtfully devised on a scale adapted to the needs of their districts, and reckoned by those who had provided them as among the most valuable defenses of these districts; others ill-placed or on an altogether insufficient scale, or badly planned, doing duty in default of better, though of flimsy, material and hurried construction.

2. Whether or not any injurious effects upon the health of a population could be traced to the presence of a hospital in its midst was the further problem which Dr. Thorne's inquiry was directed to solve, and his results are chiefly negative. In several cases he found infection communicated through some fault of administration. He also, in the case of small-pox, discovered two instances where infection had appeared to spread from a hospital in a row of houses to other houses, in a way that suggested the conveyance of the infective matter through the atmosphere rather than by means of persons or things. In many other instances the same disease, small-pox, being in question, Dr. Thorne heard of no extension of infection to neighboring streets and houses, in spite of the best inquiries he and officers of health could make. This is all; for the rest, Dr. Thorne, having to tell many a story of hospitals in which the circumstances of site, of construction, and of management, might have been better than they were, has nothing to record of fevers, scarlet, typhus, enteric, or other infectious diseases, spread from the hospital, as such, to its neighborhood. In regard to the danger from these diseases, Dr. Thorne says: "My inquiry will tend to show that in well administered hospitals, having an open space of some forty feet between the hospital wards and any neighboring thoroughfares or buildings, no risk of the spread

of infection from scarlet fever, typhus, and enteric fever need be apprehended."

3. As to the two cases of small-pox from hospitals. These occurred at Maidstone, Kent county, an urban, and at Stockton, Durham county, also an urban hospital; both being houses rented for the purpose, both being in a row of houses, and in the case of the former, another row of houses were only distant twenty-three feet, across the street. In both instances the hospitals in question were buildings which ought never to have been used by a sanitary authority for isolation of cases of infectious diseases, forming part, as each one did, of a row of dwelling houses, and being in each case so situated that the patients had to be removed from the ambulances in the public thoroughfare.

4. Finally it is to be remarked that all of Dr. Thorne's evidence in regard to safety to neighboring dwellings from infectious diseases is of a negative character. Now, although negative evidence is valuable as to the spread of such diseases as scarlet fever, typhus, diphtheria, enteric fever, etc., against which there is no protection but a previous attack, and even that is not always a preventive, yet when applied to small-pox it loses most of its value, becomes indeed comparatively worthless, owing to the possible fact of the complete protection afforded by vaccination to a population near a small-pox hospital. Dr. Thorne notes this himself, by saying: "Negative evidence, however, of this character loses much of its value in the case of small-pox, by reason of the large amount of vaccination which is carried out in most districts when small-pox becomes prevalent. That this source of error must be taken into consideration with regard to Nottingham, is within my personal knowledge, and in forming any conclusion as to the small extent of the spread, if any such spread took place, under circumstances such as obtained at Maidstone, regard must be had to the same point. Thus, in the latter place, nearly all of the residents in the immediate vicinity of the hospital were found to have been protected against the disease either by vaccination or a previous attack of small-pox."

SMALL-POX HOSPITAL IN LONDON.

From the report of Mr. W. H. Power, on the influence of the Fulham small-pox hospital on the neighborhood surrounding it, we learn the following:

1. Fulham hospital is one of five similar structures erected by the managers of the Metropolitan Asylum District. It is in West London. The site comprises six and a half acres; it is a pavilion hospital with ten wards, to accommodate 300 patients, and is administered in the most admirable manner. The hospital was opened for small-pox patients on March 10, 1877, and it continued to receive patients up to the time of Mr. Powers' inspection, January 17, 1881, and several weeks afterward, during which period 2,527 cases of acute small-pox were admitted.

Fulham hospital occupies a site that, from the view point of medical knowledge at the time of its selection, was singularly free from objection.

With few exceptions there are not within 500 feet of the limits of the hospital grounds any inhabited dwellings. Outside the 500 feet limit, and up to the quarter mile radius from the center of the hospital, houses, though more plentiful, number only a few hundreds; but beyond the quarter mile limit they encompass the hospital on all sides.

2. General result of inquiry:

(*a.*) There has been in each epidemic period an excessive incidence of small-pox in houses in the neighborhood of the hospital as compared with more distant houses in Chelsea, Fulham, and Kensington.

(*b.*) The percentage of houses invaded in the neighborhood of the hospital has become gradually smaller as the distance of the houses from the hospital has increased. This gradation has been very exact and constant.

(*c.*) Houses upon the chief lines of human intercourse with the hospital have not suffered more than houses lying in other directions from the hospital.

(*d.*) In point of time there has been a very marked relation between the varying use of the hospital and the manifestations of excessive small-pox in the neighborhood. This relation has not shown itself while the use of the hospital has been for convalescents only.

(*e.*) The appearance of excessive small-pox in houses around the hospital has never been delayed until the hospital has become full or nearly full. It has always been most remarkable at the time when admissions to the hospital were beginning to increase rapidly.

(*f.*) On comparison of different epidemics, an almost constant

ratio is observed between the amount of the hospital operations and the degree of excess of small-pox in the neighborhood.

The following table shows admissions of acute small-pox to Fulham hospital and incidence of small-pox upon houses in several divisions of the special area, during five epidemic periods:

CASES OF ACUTE SMALL-POX ADMITTED.	IN EPIDEMIC PERIODS SINCE OPENING FULHAM HOSPITAL.	INCIDENCE IN EACH ONE HUNDRED HOUSES IN SPECIAL AREA AND ITS DISTRICTS.				
		On total special area.	On small circle 0-¾ miles.	On 1st ring ¾-1½ mile.	On 2nd ring 1½-2¾ mile.	On 3rd ring 2¾-4 mile.
327	March, 1877 to the end, 1877	1.10	3.47	1.37	1.27	.36
714	Jan., 1878—Sept., 1878	1.80	4.62	2.55	1.84	.67
679	Sept., 1878—Oct., 1879	1.68	4.40	2.63	1.49	.64
292	Oct., 1879—Dec., 1880	.58	1.85	1.06	.30	.28
515	Dec., 1880—April, 1881	1.21	3.00	1.54	1.25	.61
2,527	Five periods	6.37	17.35	9.20	6.16	2.57

The two following tables will explain the figures on the opposite pages, showing the area of infection. See Figures 24 and 25.

Epidemic period—1876 to 1877. See Fig. 24.

Period antecedent to the establishment of Fulham hospital (March, 1876, to March, 1877).

Rate per 100 houses in area referred to:

Whole of three Parishes.	Special area—one mile.	Other parts of the Parish outside special area.
.41	.15	.54

Epidemic period, 1876 to 1877. See Fig. 25.

Period subsequent to the establishment of Fulham hospital (March, 1877 to end of 1877)

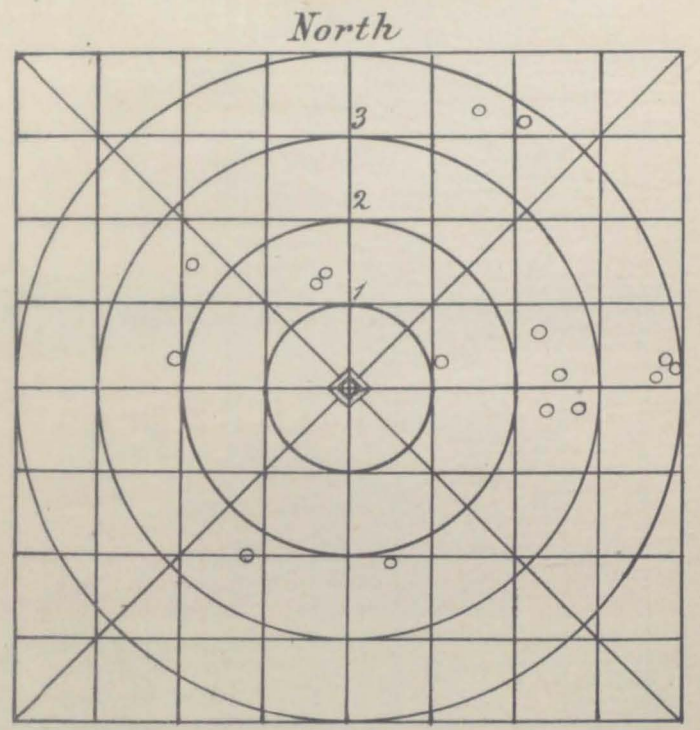


FIG 24

North

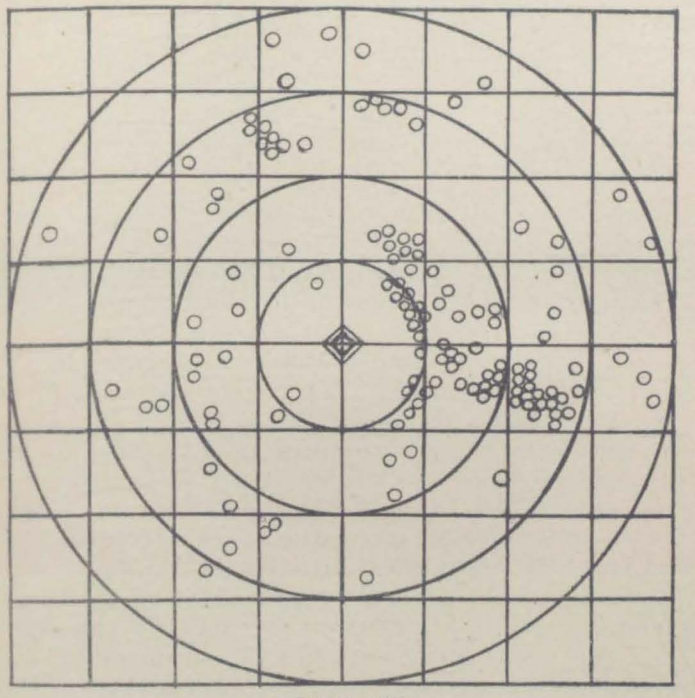


FIG. 25.

Rate per 100 houses in each area referred to:

Whole three Parishes.	Special area—one mile.	Other parts of Parishes outside special area.
.94	1.10	.86

INCIDENTS OF SMALL-POX ON SPECIAL AREA AND ITS DIVISIONS.

Total special area.	On small circle 0-¼ mile.	On 1st ring ¼-½ mile.	On 2d ring ½-¾ mile.	On 3d ring ¾-1 mile.
1.10	3.47	1.37	1.27	.36

Here there is abundant evidence, and that of the most positive character, that small-pox does disseminate its poison around a hospital as a focus to a distance in every direction of at least three quarters of a mile, and that outside of any apparent human agency. How it happens, and how to prevent its recurrence in the future, are the urgent problems which are suggested for solution.

Seeking the cause we naturally turn first to the meteorological conditions, and of these the wind may be at once eliminated as a cause, for it is obvious that the incidence of small-pox radiated equally in all directions, even against the direction of the wind prevailing during the period of excessive incidence.

In the latter part of January, 1881, according to a table given by Mr. Power (Table E2, p. 349) there was a sudden outbreak of small-pox in the vicinity of Fulham hospital, forty-one houses being invaded during the fortnight ending February 5th, in contrast with five for the preceding fortnight ending January 22d.

Now, referring to the Greenwich meteorological observations, what kind of weather is found about fourteen days previous to this outbreak? A low barometer, severe frost, still, sometimes foggy weather, with occasional light airs from all points of the compass.

In the days, then, of the chief distribution of small-pox around Fulham hospital, there existed over the neighborhood of the hospital opportunities of a remarkable kind, not for removal of matters contained in the air, but for the quiet dissemination of matters contained in the air, and for the deposit, perhaps, of any that were particulate.

While the incidents of small-pox upon houses coincident with this

distribution of aerally-contained matters was almost the same in all directions from the hospital as a center, the intensity of the incidence (measured by the percentage of houses invaded) was proportioned to the nearness of the houses to the hospital. In these particular days, too, an increasing number of acute cases of small-pox, being received at the hospital was charging the air of the hospital with an abundance of infection in an active state. Mr. Power here remarks that "*in view of the whole case I find it impossible to regard these circumstances excepting as standing to each other in the relation of effect to cause.*"

Another meteorological circumstance, perhaps, is deserving of notice. We know too little of the action of *ozone* upon infections to justify much of positive inference from its presence or absence.

But from the 8th of January, 1881, to the 17th, eight days, *ozone* was entirely absent, and from early in December, 1880, to the end of March, 1881, there was no similar period of its absence. Ozone was present therefore just before, was absent during, and it reappeared at the end of, the period in which sufferers by the outburst of small-pox became infected.

Finally Mr. Power states that as a result of his inquiry, it would appear that, "During this epidemic period, and most probably during former similar periods, there has arisen in the atmospheric circumstances of the time, peculiar facility for the dissemination in an undamaged state of any matter that may have been given off from the hospital."

These "*atmospheric circumstances*" and the concentration of large numbers of acute cases of small-pox in a hospital are to be considered as the prime factors in such a dissemination of the disease as occurred at Fulham.

This branch of the subject may be appropriately closed by a literal transcription of a portion of the first paragraph of Mr. Power's report: "The circumstances of the Fulham hospital probably have a broad resemblance to those of other London small-pox hospitals in respect to the subject of these allegations; and the lessons to be learned from the present inquiry will probably not be without their application *mutatis mutandis*, to small-pox hospitals in other parts of the country" (and we might add "of the world").

As to the protection of persons living near a small-pox hospital, it

is obvious that there are three modes of effecting this most desirable result.

The first and most certain mode is to vaccinate everyone in the vicinity, so that they may defy and laugh to scorn the contagion or infection of small-pox.

The second is to sufficiently increase the distance between small-pox hospitals and surrounding inhabited dwellings, the minimum distance, as taught by the lesson of Fulham hospital, being one mile. This end, difficult of attainment anywhere, is impracticable in the vicinity of towns and cities; which are the only places likely to need small-pox hospitals of any size.

The third method is to pass all the air emanating from small-pox patients through a fire, where the particulate matter constituting the poison of small-pox, the so-called germ, is certainly rendered inert, if not destroyed, as the numerous experiments with the Ransom stove have shown that a dry temperature of 255° F. is sufficient to disinfect any woolen garment infected with small-pox.

There are various modes of effecting this. Dr. Billings, U. S. Army, in his "Letters to a Young Architect," (Sanitary Engineer, Vol. 7, No. 6), describes a hospital visited by him in St. Petersburgh, used for typhus fever, where all the foul air passes through a central heated shaft.

Dr. Billings again (Sanitary Engineer, Vol. 7, No. 10) describes a ward for small-pox patients, devised by Dr. Burdon Sanderson, which is circular in form, hold but thirty patients. The air being admitted upon the periphery, thence, after passing over the patients, is drawn up through a central heated shaft.

Dr. O. W. Wight, health officer of Detroit, Michigan, describes (First Annual Report of the Board of Health of Detroit, 1882) an ingenious structure, which has five octagonal wards, which he calls "*A Flame Ventilated Small-pox Hospital*," which acts on the same principle as the above mentioned hospitals, the foul air passing off from the top of the ward through an iron pipe heated by a flame of gas, or some other material, to be kept constantly burning. This has never been tried, but one may be allowed to doubt whether an ordinary gas flame, in a pipe of twelve inches diameter, would heat a column of air, passing at the rate of five feet per second, to a temperature of 300° F., below which in such a rapidly moving current the disinfection of the air would not, in all probability, be effected.

But with all due deference to these learned and ingenious gentlemen, we have in the hermetically closed wards, heated by a Galton fire-place, of the small-pox hospital described in a paper which the author of this had the honor of reading before this Society in January, 1882, an apparatus amply sufficient to accomplish the same purpose as the above described more costly and pretentious structures. No one can doubt but that the passage of the foul air over the flame and through the ten feet of iron pipe of the Galton fire-place would totally destroy any germ of small-pox, especially if our common western bituminous coal, with its high percentage of sulphur, is used; for experiments in England have shown that by burning sulphur in a disinfecting stove (Nelson's) clothing may be disinfected in ten minutes, and at so low a temperature as 175° F.

THE

GEOLOGY AND TOPOGRAPHY OF IOWA

IN A

SANITARY POINT OF VIEW.

PREPARED BY

P. J. FARNSWORTH, M. D.,

FOR THE

IOWA STATE BOARD OF HEALTH.

GEOLOGY AND TOPOGRAPHY.

THE GEOLOGY AND TOPOGRAPHY OF IOWA IN A SANITARY POINT OF VIEW.

BY P. J. FARNSWORTH, M. D., CLINTON, IOWA.

The geological and topographical features of a country determine, in a great measure, its sanitary conditions or capabilities. They characterize the soil drainage and water supply, the temperature, moisture, and other qualities of the air, and the kind and quantity of the productions. They are, therefore, important elements in the consideration of the health and prosperity of a State, and merit a careful study. A subject so extensive requires a large collection of facts, some of which are accessible, others are yet to be obtained. We can, therefore, only treat it in a general manner. We can glance at primitive conditions and draw some probable conclusions from them; but a more extended record of observations must be made to determine the effects of added settlement and cultivation.

If we go back for a period of a little more than fifty years, the Territory of Iowa was in a state of nature; it had primitive soil and virgin prairie. It then became open to civilization, to men who dispossessed the nomadic Indians and the roving buffalo, who were to cultivate the earth, build towns and cities, and render their surroundings sanitary or unsanitary, as their knowledge or ignorance prompted them. In fifty years the whole State has been brought under cultivation, the face of nature changed, the soil upturned to the sun, the marshes drained, trees planted, and the vegetation altered. How far the natural surroundings are affected by artificial conditions must be determined by facts in process of accumulation. We are to consider the natural features, the geology and topography, and their relations.

Iowa is a part of the great inter-continental plain or plateau of North America. In shape it is nearly a parallelogram; its northern boundary is 43°, 30′, north latitude; its southern, 40°, 36′; its eastern and western boundaries are the two great rivers of the continent, on on the east touching 90°, 30′, west from Greenwich, and extending to

96°, 30′, west. From north to south it is 200 miles; from east to west about 300 miles. It has an area of a little over 55,000 square miles, or of arable land over 35,000,000 acres. Originally it was a uniformly level sea bottom, gradually coming to the surface. In some great convulsion of nature it was elevated above the ocean, and inclined toward the southeast, favoring its drainage and exposure to the sun. Its highest part is near the northwest corner, where it is 1,700 feet above the sea; its prairie level at the southeast is about 600 feet. A slight fold or flexure gives a decline to the west of a small portion of the State; still, on a line drawn through the middle of the State from east to west, the Missouri flows in a valley of erosion as deep as that of the Mississippi, but in a bed 425 feet higher. The underlying rocks are of two or three geologic ages, but of not a greatly varied composition. They were covered with a pretty uniformly deep layer of drift composed of argillaceous material. Then came a period of erosion, and the rivers formed plains and channels through the drift and into the underlying rock in some places. There are evidences of a submergence and a filling up of the old water courses, after which the rivers found their old channels again, or formed new ones, leaving the modified drift on their banks, or in their abandoned courses. The direction of the drainage follows the

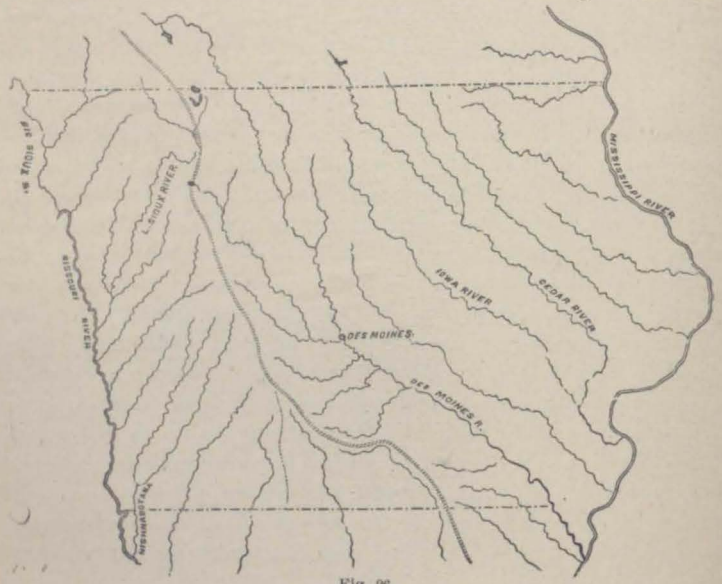


Fig. 26.

inclination. Two thirds of the rivers of the State flow to the southeast, in nearly a parallel direction and fall into the Mississippi. See Fig. 26.* A line of elevation runs across the State, west of the Des Moines river, and nearly parallel with it, making a water-shed to the southwest toward the Missouri. There is, however, but little deviation from the general prairie level over the whole State. The river valleys vary in width, and in most places are bordered with abrupt banks or bluffs.

Over the drift is a thick layer of humus that has been accumulating for long ages. Along the banks of streams where the soil is thin and grass does not grow luxuriantly, trees are found; also they grew in isolated groups and in a scattered condition. Nothing like a continued forest exists, except in some of the river valleys, and these not very numerous.

The drift material came from a region to the north and northeast. It is composed of the disintegrated Devonian rocks, and of a cretaceous formation. This cretaceous stratum is in place, in a portion of the northwestern part of the State, and extends to the upper waters of the Missouri; its debris is found in a large portion of the soil of the State. From it is derived lime, magnesia, potash, and soda; lime, and magnesia in large quantities. These affect all the wells and springs found near the surface or in the drift. The sulphates and the chlorides of potash and soda appear in many places to a limited extent. At some remote period all the marshes and shallow lakes must have been strongly alkaline.

The soil of most of the western water-shed affords some striking peculiarities. It is homogeneous to a great depth and is denominated a lacustrian formation. At some time a deep valley existed which became a lake and was filled with sediment, the wash of all that great northwest which make the Missouri the "big muddy," and of which some observer remarks if it had been turned into Lake Superior would have filled it and all the chain of lakes with solid land.

It consists of clay, sand, lime, and other alkalies and vegetable matter, and makes a fertile soil when thrown up from hundreds of feet below the surface.

Nearly all the water used for domestic purposes comes from shallow wells. Springs occasionally are found, and some of the larger towns are beginning to draw their supply from the rivers. Wells are

* This cut is used by permission of Mills & Co., publishers of White's Geology of Iowa.

yet the main dependence for farm houses, towns, and cities. They are from ten to fifty feet deep. The sub-soil holds the necessary supply, and the ground-water is near the surface. All are contaminated with the salts of lime, and some with magnesia and the sulphates, and chlorides of potash and soda. All the waters of rivers, lakes, and springs are hard. This does not seem to be a source of ill-health, so far as yet observed. It sometimes temporarily affects new comers, but this is soon overcome.

It has been observed in European countries that the strongest conscripts come from the hard water districts. The deep layer of humus, and the organic material of the drift may contribute more objectionable elements to the potable waters. The ponds and streams, beside containing lime and other alkalies, are contaminated with organic matter, more than cleanly kept wells. Settlement and cultivation add pollution to the streams, and contamination to the wells; for the soil is not of a character to thoroughly filter out impurities; therefore, special precaution must be used. In some places wells are drilled into the underlying rock, but this is of a porous nature, and admits surface water; and is itself largely dissolved by the water that penetrates it.

Ground or surface water exists at a little depth over all the State; there being no season of great dryness that evaporates it, but often there are rainy seasons that keep the soil saturated all the year. In other words, the soil of all the country may be classed as a moderately damp one.

The cause of ague, or periodic fever has in all ages been a fruitful source of discussion. Miasm, or malaria, a poison generated in certain soils by heat and moisture, entering the system to produce a specific result. Whether it is a poison that accumulates in the blood, or a multiplying bacteria, a bacillus, or a microgerm, is not essential to the present subject. The fact remains that some cause of special fever prevails over all the State. It arises in seasons of great heat and moisture, and is not confined to any locality, but affects all the State. Certain soils may be better for its development than others, and it may be denser in certain localities, yet owing to there being no ranges of hills or mountains, and no continuous forests, the winds equalize it over the whole land.

This general diffusion only happens at rare intervals, yet in every part of the State, in any season, few diseases occur that do not manifest symptoms of this poison, and require antidotes that counteract it. Cultivation of the soil and general drainage may diminish or destroy it; they have not yet done so to any extent.

As our State is only a portion of the great plains, where like conditions exist, it will require more extended sanitation, beyond our borders, before the malady will be obviated, or cease to make its appearance among us.

Turning up the soil to the sun, drainage of surface and sub-soil, and the growth of trees, are the remedies that are to be applied for its extinction.

The greater portion of the State was destitute of trees. They grew only in thin soils and along water-courses. The reason for this may have been in the early condition of the surface, covered with shallow water, often alkaline, then covered with grass and herbage that afforded material for annual (spring or autumn) fires. Trees grow in the upland prairie luxuriantly, when planted and protected, but when exposed to the fires that used to prevail, none took root, or if rooted did not survive. There are dry periods every year after vegetation has ripened, or been killed with frost, when a fire once started spreads far and wide. These dry periods may have been longer in past times, as there are evidences that the rainy belt is extending farther west at present. It is very conclusive to any one who has observed prairie fires, that this is the reason the prairies were treeless.

Geologists are proving the existence of man even before the glacial or ice period. He was always a fire-using animal, and it is probable that for sport or by accident he started the annual burning that kept down the forests.

Notwithstanding the destruction of the timber found in the country when first settled, tree culture is becoming a part of agricultural work, and groves and ornamental trees meet the eye in every direction where once it was only a sea of grass. This must in time produce a beneficial change in the climate and health of the State. It is shown that destroying the forests of a country increases the severity of its climate, and contributes to its barrenness, so the cultivation of forests in a fruitful but treeless country, must improve the purity of the air, mitigate its heat and cold, and regulate its moisture.

The Mississippi river running along the eastern border has a valley or flood plain from two to eight miles in width. In the lower part of the State it is one hundred and fifty feet below the level of the prairie,

increasing in the upper part to four hundred. The banks are abrupt, and in many places precipitous. If soil is afforded, they are covered with trees and a flora differing from the prairie; this is also true of the trees of the bottom. Some of the largest cities of the State are built in this valley and on the adjacent bluff. The temperature and rainfall is not appreciably different, but the force of certain winds are broken.

The soil of the plain is an alluvium resting on a drift-clay, this resting on the rock which for the greater part of the river course is a soft magnesian limestone. The wells are dug in the clay or sunk into the porous rock.

Most of the other cities of the State are built in river valleys where nearly the same relations of humus, alluvial matter, clay and rock exist, except that on the rivers of the interior and the Missouri, the rock is at a great depth.

The larger cities are beginning to draw their water supplies from the river, but shallow wells are in a great part depended on, and will be for some time to come.

The valleys of the Mississippi and Missouri are subject to occasional overflows. This occurs in April, May, June or August; sometimes in September or October. These overflows are not regular but occur with intervals of from three to ten years. The period of high water usually lasts from five to ten days. No special disease or epidemic has been observed to follow these inundations. The rank vegetation of a fertile soil soon covers the ground in spring or summer after the water subsides, and absorbs the moisture; in autumn the frost destroys it.

The drainage of the river valleys is difficult; the cellars are uniformly damp, if not actually filled with water for the greater part of the year, owing to the proximity of the ground water; this is true of the cellars in prairie towns and in farm houses. It undoubtedly is a cause of disease, and especially may have to do with one that, though not very prevalent, is becoming much too frequent, consumption. From a limited observation it seems much more common than in the early history of the State. Dr. Bowditch, of Massachusetts, and Buchanan of England, have proven the relation of consumption to ground-water or soil dampness. They have shown that consumption is greatly decreased in certain localities where efficient drainage has been introduced, and that "there is a certain connection with the frequency and

mortality from phthisis and a damp soil." "Additional evidences," says a late writer on hygiene, "from different parts of the world has confirmed the conclusion that dampness of soil is an important cause of phthisis to the population living upon the soil."

Twenty years ago the writer settled in a city in the valley of the Mississippi, and in a radius of twenty miles never saw or heard of but one case of consumption for eight years. From that time until the present, cases have been known each year, until it has amounted to as many as ten, in some of the later years. This is believed to be true of other parts of the State. There has been no marked increase or decrease of other diseases in that time so far as observed.

Other factors are to be taken into account, such as difference in the modes of life, increase of population with hereditary tendency to the disease, advance in time of life—all are not sufficient to account for the increase in tubercular disease.

As a matter of limited experience in regard to soils, it has been observed that a tract of alluvial land is a locality of frequent malarial disease. The probable explanation is, that the same contains a large amount of organic matter, and that impurities that fall on the surface penetrate to some distance, the water flows away and leaves them, instead of being carried away by surface drainage, as on an impervious soil.

The prairies are nowhere entirely flat, but are in swells, like the waves of the sea. This leaves many depressions that hold water and make shallow ponds or "sloughs," that are permanently or temporarily filled with water. They contain the waters drained from the surface after rains or melting snow. In a few places there are ponds or small lakes of sparkling water, but most of them are susceptible of drainage, or dry up during the heat of the summer. They contain a large amount of organic matter, and are the source of miasm. They would be much more so if the coarse grass that springs up did not absorb it to a great extent. There are few marshes or sloughs in the State that are not susceptible of drainage, as they are not fed by springs. The advance of settlement has brought most of these tracts into cultivation.

The climate of the State is modified by its position; a central portion of a great plain that has a gentle incline to the south; in the heart of the continent. The plateau extends from the eastern base of the Rocky mountains—perhaps it would be better to say from the

lower summit instead of the base; for if we pass west it is a gradual and almost imperceptible ascent until we attain 7,000 or 8,000 feet. The State at the southeast corner reaches near the lowest part of the plain, which then ascends to the east to the foot of the Alleghenies.

The isothermal line passes across the State diagonally, advancing to the northwest. It is in a measure protected from the storms of the Atlantic, and is far enough from the mountains that intercept the moisture from the Pacific to receive a due amount of precipitation. Its winters are usually mild; spring opens early enough for the planting and propagation of all the grains and fruits of the temperate zone; a hot month or two of summer follows, then the mild, hazy weather of autumn is sometimes prolonged until December. Moderate snows fall during the winter, the cold is seldom intense, the rainfall and moisture is pretty evenly distributed; general or long continued drouth is never experienced.

The moist wind comes from the northeast over the great lakes and up the valley of the St. Lawrence. The dry currents, or wind of precipitation, comes from the northwest from a cooler latitude, and over the dry plains. Winds blow from other directions. A gusty, cold wind blows in winter and spring from the northwest that is denominated a blizzard. It is a very absorbing wind, and, aside from its discomfort, must purify the air and leave it healthful. Gales and tornadoes sometimes visit the State from the southwest.

Observations on meteorology have been made in various parts of the State for a series of years. A general uniformity of temperature prevails, local storms arise, and moisture is sometimes unequally distributed. The average temperature has varied less than a degree for a period of forty years from January to the end of December; in two or three localities the yearly average of three daily observations is 27½ degrees, not varying a degree in any year.

Frost comes the last days of September or the first weeks of October. Snow falls in November, the Mississippi freezes over the first of December, the coldest days are about the first week of January. Spring opens in March, hot weather commences in June and is most intense during July. A cool wave passes over the State the last days of August or first of September. The mild hazy Indian summer weather begins in October.

This may be called the average climate; in thirty years there have been a few exceptional seasons. Three times within that period the

winters have begun in November, extreme cold occurring in January, with heavy falls of snow. For several days together the mercury has fallen to from 20° to 30° below zero. Two or three feet of snow has fallen and remained in drifts where the winds piled it until the middle of April.

On the other hand, in the same period have occurred winters in which very little snow fell, and the ground and the rivers were unfrozen in January, and spring opened by the first of March.

The mercury rises to 95° in July but seldom more than a degree or two above that. One of the oldest observers in the State makes the remark that he has never seen the mercury rise above 98° in the hottest day or fall below 36° below zero in the coldest. A cold winter is followed by a hot summer.

The rain-fall is much more variable and modifies the heat of summer, and determines the prevalence of certain diseases. Rainy and snowy belts and local storms are sometimes observed. Dry cold weather, except as a general depressing agent, is healthful; dry hot weather is also sanitary; but when cold and dampness occur lung diseases prevail, when moist hot weather occurs in the after part of summer, malarial fevers and summer complaints of children are frequent or epidemic.

A cold winter, followed by a damp cold March happens in exceptional years, not as a rule, and there results a large mortality among aged people, and those predisposed to consumption. During three or four summers in twenty years, rain has fallen during the month of August, accompanied with hot weather. Malarial fevers have been epidemic, and the mortality among children very great.

This subject of meteorology is to be left to others, and the relation of climate to disease is to be determined when the board have obtained the necessary statistics.

Local causes will then be found as the origin of many diseases.

Geologically considered the State rests on a formation of magnesian limetone. This is covered for the most part conformably, with a drift deposit varying from two to three hundred feet, of an argillaceous character. It contains the remains of a formation similar to that on which it rests, and also of a cretaceous strata, and contains considerable vegetable matter. Over this is a deep layer of humus. The clay sub-soil contains a large amount of lime, and its salts affect the water found but a little way below the surface. The water for

domestic purposes is hard, and sometimes contaminated with other salts than those of lime, and with organic matter. The proximity of the ground water makes the habitations damp. People become accustomed to the use of hard water, and it is not known to be the source of any disease. It is easily polluted, but that is an artificial result, and not to be considered here.

The dampness of soil may originate phthisis and aggravate other complaints. The organic matter of the superficial soil generates miasm. These are the most obvious points of the geology and the sanitary condition connected with it. Topographically, the country is part of a great plain in the interior of the continent, inclined to the southeast, equally exposed to the sun and wind. It has universally the same dampness when the moist current comes, and the same dryness when the dry winds blow, as there are no hills nor mountains nor forests to deviate storms or epidemics.

The rivers flow in valleys of erosion, many of them worn deep through the drift into the underlying rock.

The facilities for drainage are good, except in some of the river bottoms, where towns are located, there not being elevation sufficient to escape the flood tides. The climate is but little modified by the topography, being subjected mostly to influences beyond the State, it being part of the great intercontinental plain open from Hudson Bay to the Gulf of Mexico, bounded by the distant mountains along the Atlantic on the east, and the far off Rocky mountains on the west. Its central position gives it a medium climate, favorable for fruits and grains of the latitude, and also favorable for health and longevity.

TREATMENT OF

THE DROWNED.

ADOPTED BY THE

IOWA STATE BOARD OF HEALTH,

AND

PRINTED FOR GENERAL DISTRIBUTION.

TREATMENT OF THE DROWNED.

TWO THINGS TO BE DONE: RESTORE BEATHING; RESTORE ANIMAL HEAT.

Fig1.

RULE 1. Remove all obstruction to breathing. Instantly loosen or cut apart all neck and waist bands; turn the patient on his face, with the head down hill; stand astride the hips with your face toward his head, and, locking your fingers together under his belly, raise the body as high as you can without lifting the forehead off the ground (Fig. 1), and give the body a smart jerk to remove mucus from the throat and water from the windpipe; hold the body suspended long enough to slowly count ONE, TWO, THREE, FOUR, FIVE, repeating the jerk more gently two or three times.

Fig. 2

RULE 2. Place the patient face downward, and maintaining all the while your position astride the body, grasp the points of the shoulders by the clothing, if the body is naked, thrust your fingers into the armpits, clasping your thumbs over the

points of the shoulders, and raise the chest as high as you can (Fig. 2) without lifting the head quite off the ground, and hold it long enough to *slowly count* ONE, TWO, THREE. Replace him on the ground with his forehead on his flexed arm, the neck straightened out, and the mouth and nose free. Place your elbows against your knees and your hands upon the sides of his chest (Fig. 3), over the lower ribs, and press downward and inward with increasing force long enough to slowly count ONE, TWO. Then suddenly let go, grasp the shoulders as before and raise the chest (Fig. 2); then press upon the ribs, etc. (Fig. 3). These alternate movements should be repeated ten to fifteen times a minute for an hour at least, unless breathing is restored sooner. Use the same regularity as in natural breathing.

Fig. 3.

RULE 3. After breathing is commenced, RESTORE THE ANIMAL HEAT. Wrap him in warm blankets, apply bottles of hot water, hot bricks, or anything to restore heat. *Warm the head nearly as fast as the body, lest convulsions come on.* Rubbing the body with warm cloths or the hand, and slapping the fleshy parts, may assist to restore warmth, and the breathing also. If the patient can SURELY swallow, give hot coffee, tea, milk, or a little hot sling. Give spirits sparingly, lest they produce depression. Place the patient in a warm bed, and give him plenty of fresh air; keep quiet.

BEWARE!

AVOID DELAY. A MOMENT may turn the scale for life or death. Dry ground, shelter, warmth, stimulants, etc., at this moment are nothing—ARTIFICIAL BREATHING IS EVERYTHING—is the ONE REMEDY—all others are secondary.

DO NOT STOP TO REMOVE WET CLOTHING before efforts are made to restore breathing. Precious time is wasted, and the patient may be fatally chilled by the exposure of the naked body, even in summer. Give all your attention and effort to restore breathing by forcing air into and out of the lungs. If the breathing has just ceased, a smart

slap on the face, or vigorous twist of the hair, will sometimes start it again, and may be tried incidentally, as may, also, pressing the finger on the root of the tongue.

Before natural breathing is fully restored, do not let the patient lie on his back, unless some person holds the tongue forward. The tongue by falling back may close the windpipe and cause fatal choking.

If several persons are present one may hold the head steady, keeping the neck nearly straight; others may remove wet clothing, replacing at once clothing which is dry and warm; they may also chafe the limbs, and thus promote the circulation.

PREVENT FRIENDS FROM CROWDING AROUND THE PATIENT AND EXCLUDING FRESH AIR; also from trying to give stimulants before the patient can swallow. The first causes suffocation; the second, fatal choking.

DO NOT GIVE UP TOO SOON: You are working for life. Any time within two hours you may be on the very threshhold of success without there being any sign of it.

IN SUFFOCATION BY SMOKE OR ANY POISONOUS GAS, as also by hanging—proceed in the same manner as for drowning, omitting effort to expel water, etc., from the windpipe.

IN SUSPENDED BREATHING FROM EFFECTS OF CHLOROFORM, HYDRATE OF CHLORAL, etc., proceed by Rule 2, taking especial pains to KEEP THE HEAD VERY LOW, and preventing closure of the wind-pipe by the tongue falling back.

The foregoing method, originally published by the State Board of Health of Michigan, being a modification of that adopted by the Life-Saving Society of New York, has the sanction of other State and city boards of health, and is fully endorsed by the State Board of Health of Connecticut, Wisconsin and Iowa, and is printed for general distribution as a life-saving measure.

Address STATE BOARD OF HEALTH,
Des Moines Iowa.

PRESERVE THIS.

STUDY IT THOUGHTFULLY, in order to act efficiently, if occasion requires.

NOTE.—Owing to the great loss of life, annually, from drowning, this circular is reprinted herein, for the public benefit. Copies can be had by sending for Circular 24B.

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