Diphtheria : its prevention, restriction and suppression / Issued by the Illinois state board of health, 1907.

Illinois. Dept. of public health.
Diphtheria.

DIPHTHERIA

ITS

PREVENTION, RESTRICTION AND SUPPRESSION

ISSUED BY

THE ILLINOIS STATE BOARD OF HEALTH

1907.

REVISED EDITION

Please Preserve for Future Use.

Should a case of Diphtheria occur near you, you can do yourself and your community a great good by seeing that the family has one of these pamphlets.

Copies can be obtained by any resident of Illinois, without cost, by addressing the Secretary at Springfield.

SPRINGFIELD, ILL.
ILLINOIS STATE REGISTER
1907

Examples of the Manner in Which Diphtheria May be Contracted.

A teacher developed diphtheria from passing the night in a room in which three weeks before a fatal case had occurred. A child developed diphtheria after putting on the clothing worn by a child which had died of diphtheria two months before. In a number of isolated dwellings diphtheria developed nearly a year after previous outbreaks, without there being any apparent possibility of a new infection taking place from the outside. I have met with a number of cases where the infected bedding or clothing has undoubtedly been the source of the infection.—From American System of Practical Medicine, Loomis-Thompson.

DISINFECTION OF HOUSES.

A very wholesome practice that bids fair to become an established custom is the disinfection of a rented house before a new family moves into it. This is done, now, where a case of very contagious disease, say smallpox, or diphtheria, has been known to exist; but how can we feel sure that the house we are about to move into and live in has not had in it an unrecognized or a suppressed case of measles, scarlet fever, or tuberculosis or typhoid fever? Disinfection after these diseases is of the highest importance. Then, again, there are those diseases that are not fatal, perhaps, but, being communicable, may become certainly afflictions, nuisances. This precaution therefore should be demanded of every landlord by those who are planning to rent the house.—Public Health, Michigan.

DIPHTHERIA.

ITS PREVENTION, RESTRICTION AND SUPPRESSION.

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ITS SANITARY FEATURES.

Diphtheria is a highly contagious disease, rapidly communicated from person to person.

The infection of diphtheria is contained in particles or shreds of the diphtheretic membrane or in the expired air. These are communicated by direct contact with the patient, by inhaling the air surrounding him, and by coming in contact with articles used in the sick room, such as carpets, bed clothes, clothing, books and toys. The infection clings tenaciously to these articles. The virus may remain dormant in dwellings for a long period, and unless destroyed by disinfection, may give rise to a new outbreak.

Filth plays a very important part in the spread of diphtheria, for unsanitary conditions tend to lower vitality, and, in consequence, to increase the susceptibility to the disease. There is no doubt, also, that sewer gas may be a carrier of diphtheritic poison and that many outbreaks hold a close relationship with defective drainage, sewers and cesspools.

Over-crowding, faulty ventilation and filthy conditions of habitation favor the spread of the disease, as do also soil moisture, damp cellars and general dampness of houses.

"Intentions, like eggs, unless hatched into action, will run into rottenness."

It is possible that diphtheria may be communicated by dogs, fowls, pigeons and the like. It is known that cats are susceptible to human diphtheria and are capable of communicating the disease to other cats and also to human beings.

Children under fifteen are usually most susceptible to diphtheria, although adults may be attacked with fatal results. The disease is most fatal between the second and fifth years. A healthy child is not as susceptible to diphtheria as one whose vitality has been weakened by unsanitary conditions.

A person may have diphtheria more than once.

Whenever diphtheria exists in malignant form there will generally be found some obvious cause, such as accumulation of filth, unclean cellars, foul gutters or cesspools or overflowing privy vaults.

Every case of diphtheria is dangerous to life. A physician should be called early whenever, on examining the throat of a sick child, it is found swollen and red, and if there is evidence of the appearance of white, gray or yellow membrane. A delay may be fatal to the patient. The treatment of diphtheria is most effective if commenced within twenty-four hours after the appearance of the membrane.

"Delay always breeds danger."

Membranous Croup.—The majority if not all cases of so-called membranous croup are laryngeal diphtheria, the membrane being usually limited to the upper part of the windpipe. In these cases an inspection of the throat may or may not show the presence of the membrane. Without a bacterial examination, the facilities for which are seldom available except in cities, it is impossible at the onset to differentiate diphtheritic from benign croup. As the majority of cases of membranous croup, however, have been found to be genuine diphtheria, all cases of membranous croup should, in the interests of the lives and health of the children of the state, be considered diphtheria, so far as isolation, quarantine and disinfection are concerned.

PREVENTION, RESTRICTION AND SUPPRESSION.

Diphtheria is a preventable disease. A rigid observance of the rules of the State Board of Health will often prevent the introduction of the disease, and is always followed by a limitation of the disease to the first case or cases. If diphtheria spreads from one house to another some one is to blame. The parents who permit their children to enter a house in which they know, or suspect, there is a case of diphtheria, or to play or mingle with children from that house, need not attribute the sickness and subsequent death of one of their loved ones to the mysterious dispensation of Divine Providence. The parents who fail to make known the existence of diphtheria in their houses, who allow the children of their families to go to school and mingle otherwise with other children, and who, during the period of sickness, disregard all health laws and sanitary precautions, are morally responsible for whatever sickness and death may occur through their negligence.

Observe the Golden Rule.

The local health authorities, who, after being advised of the presence of diphtheria in a family, fail to quarantine the premises, and to insist on the isolation of the patient and compliance with all precautions necessary to prevent the spread of the disease, are guilty of culpable negligence.

During the existence of diphtheria or scarlet fever in a community, all cases of sore throat with fever are to be looked upon with suspicion until their innocent character is established.

Whenever a child has sore throat and fever, he or she should be at once separated from other members of the family until a physician has passed an opinion on the nature of the ailment. This precaution should never be neglected, especially if the child vomits or has a chill, or is sluggish and languid, and looks heavy-eyed. By "separated" is meant placed in a room apart as far as possible from other rooms in the house. From this room all other children must be kept.

A child is attacked with diphtheria usually within two or four days after exposure. The disease may come on within 12 hours after the child has come in contact with the poison, and, again, no symptoms may develop until the seventh day. If a child does not show signs of illness by the tenth day it can be safely concluded that the disease has not been contracted. A child known to have been exposed should be carefully watched for a week or ten days, and on the slightest sign of illness, be separated from all others.

Keep away from the sources of contagion. Do not go where the disease is if you can avoid it, and do not let your children go near an infected dwelling or mingle with children or others coming from the premises. If you know that children from infected houses are permitted to attend school, withdraw your children from that school, should they be in attendance, and notify the State Board of Health. Permit no one to enter your house who has been exposed to diphtheria. During the prevalence of diphtheria, in epidemic form especially, avoid all public gatherings and keep your children away from such.

"To fear the worst often cures the worst."

At all times, and especially during the prevalence of disease, keep your premises and its surroundings,—your yard, outhouses, cellars,—in a sanitary condition. Allow no filth to accumulate. Draw off all pools of stagnant water. Burn all rubbish. Use disinfectants freely; they are cheap, sickness is costly. Bear in mind continually that while filth may not cause diphtheria it is nevertheless a fact beyond controversy that the spread of diphtheria is influenced largely by unsanitary conditions, which induce an unhealthy condition of the throat and provide a suitable soil or breeding ground for the germ of the disease. A healthy child, though exposed to diphtheria, may not contract the disease; one whose vitality is weakened through the influence of unsanitary surroundings is very susceptible to the virus.

When diphtheria prevails in the neighborhood,—and at all times,—warn your children not to use, while in school, the pencils, books, etc., of other children, and especially not to put into their mouths pencils, toys, harmonicas, jewsharps, and the like, which may have been handled by other children. Warn them also to thoroughly rinse the school room drinking cup before using.

A "sore throat" in an adult may mean diphtheria in a child. Be careful not to allow children to use dishes and other utensils which have been used by adults having "sore throats." Under no circumstances should such adults kiss children.

It is better, when diphtheria exists in your family, to send the children, who are not affected, elsewhere. Do not, however, run the risk of communicating the disease to other children. In this, and in all other matters relative to disease in your household, consult your physician.

"Do as you would be done by."

Engage the services of a competent physician early in all contagious diseases. Do not wait until it is too late, when regrets are useless. You may not feel able to incur the necessary expense incident to sickness; you likewise may not feel able to pay those always attendant upon a death.

Remember that diphtheria is a preventable disease. Remember, also, that the period of sickness can be much shortened and the possible bad effects of the disease entirely prevented if competent medical attendance is obtained early.

Avoid, as you would the presence of evil, those individuals, "old women" of both sexes, who "know more than the doctor"; who insist that your child suffers from "putrid sore throat," and that the ailment is not contagious. Countless graves are filled with the bodies of innocent children, in whose little throats the deadly germ of diphtheria was allowed to prey unmolested, while these oracles in health and hygiene, often persons not knowing even the rudiments of anatomy and physiology, taught in the common schools, gravely diagnosed the ailment as "putrid sore throat."

"Nothing is more terrible than active ignorance."

ISOLATION AND DISINFECTION.

Diphtheria is a most highly contagious disease, readily communicated from person to person. As it is difficult often at the onset of a "sore throat" to determine whether the ailment is diphtheria or not, to be on the safe side, the sufferer should be isolated until medical advice can be obtained. "An ounce of prevention," here as elsewhere, "is worth a pound of cure." By "isolated" is meant kept away from other persons as much as possible. For this purpose a room on the upper floor, away from the direct line of passage, should be selected.

The room of a person sick with diphtheria should be large and easily aired. It must be kept well ventilated. There should be taken out of the room all ornaments, carpets, table covers, draperies, plush chairs and other things that are not needed in it. Dogs, cats, birds and fowls should be kept out of the room, and even out of the house. The patient must have plenty of fresh air, night and day. In winter the room should be heated with an open fire. If there is a fireplace have a fire in it, even if you must use other heat. A stove makes the worst kind of heat for a sick room. If a stove must be used, a pan or kettle of water should be

put on it. The bed should be placed near the center of the room, without letting the air blow directly on the patient.

A sheet kept wet with a solution of carbolic acid (2½ ounces of acid to one gallon of water) or with Standard Disinfectant No. 3, recommended on last pages of this circular, ought to be hung over the door or doors communicating with the sick room. This will prevent, in a great measure, the virus from attaching itself to clothing, bedding, furniture, etc., in other rooms, and will obviate the necessity of a thorough disinfection of the rest of the house after the recovery or death of the patient. Hang this sheet on the opposite side from which the door opens.

If you can do so, employ a professional nurse for the patient.

No other person beside the nurse and necessary attendants should be permitted in the room, and they should take special precautions not to carry the infection. Their communication with the rest of the family should be as restricted as possible. Do not make the sick room a place of family gathering.

"Life is not to live but to be well."

Neither the nurse nor any other person should eat or drink anything in the sick room, or anything which has been there. Food which the patient has left should be burned or disinfected. The dishes which the patient uses should not be used by others, or washed with other dishes. They should be washed by themselves in boiling water.

While the liberal use of carbolic acid and other disinfectants in the room is recommended, there should not be any attempt to disinfect the room, when occupied, by the use of volatile chemicals agents, such as carbolic acid, chlorine, etc. It cannot be done, and you but waste your time and annoy the patient. Neutralizing odors by creating others does not constitute disinfection. Fresh air and absolute cleanliness are all that is necessary. Your physician may recommend the distillation of carbolic acid in the room by means of boiling water, to prevent the passage of diphtheritic virus in the air. This may be beneficial and can do no harm unless the odor worries the patient. In this, as in all other matters, follow your physician's advice. He desires that his patient shall recover, and recover speedily.

All discharges from the bowels should be received in vessels containing a quart of Standard Disinfectant No. 1* (acid), or Standard Dis-

*See pages 26 and 27 for method of making and using the *Standard Disinfectants*.

infectant No. 2. Vomited matter and discharges from the lungs and throat should be received in vessels containing the same solution. Have this disinfectant continually on hand ready for use.

Standard Disinfectant No. 1 (acid) or Standard Disinfectant No. 2 should be always at hand for washing the floor or bed whenever soiled by discharges.

The discharges from the throat, mouth and nose are especially dangerous and must be cared for at once. It is well to prepare a number of squares of old soft cloth (old sheets or pillow cases) to receive these discharges. The cloth should be burned as soon as soiled. If there is no fire in the sick room, it is convenient to have a small tub, containing the disinfecting solution, to receive these cloths until they can be carried from the room and burned.

All knives, forks, spoons, glasses, cups and plates used by the patient must be disinfected at once by being put in a carbolic acid solution, and later boiled.

A wooden pail or tub containing Standard Disinfectant No. 3 should be kept in the room, and all blankets, sheets, towels, pillow slips and other articles used about the patient's room should be put into this as soon as they are used and before they are taken from the room. They should be allowed to soak for two hours, then they must be taken out and boiled at once. Use old blankets on the bed and burn them afterwards.

Dust and dirt must be removed by cloths dampened with Standard Disinfectant No. 3, as sweeping and dusting are objectionable. These cloths should be at once thrown into the solution or into the fire.

Books, toys and articles used to amuse the patient when convalescent are best disposed of by burning them in the room. Under no circumstances should toys be borrowed to return to be used by the well. *Never return a book taken from a public library. It must be burned.*

"In a serious trust negligence is a crime."

No person from a house where diphtheria is should go into public assemblies, such as schools, churches, or concerts, or anywhere into the presence of children. No person in said house should leave the premises without first thoroughly washing his hands, face and hair, and brushing his clothing with a whisk broom wet with Standard Disinfectant No. 3. Children who have had diphtheria should not be allowed to go to school

or to mingle in any other way with the public while they remain infectious. The period of infection varies from two weeks in a very mild case to six or more weeks in a severe case.

A person who has had an attack of diphtheria may spread the disease for six weeks from the beginning of the sickness. Such person should not associate with others nor go to school or church, or to any public meeting, until the throat is entirely well, and the sores on the lips and nose are healed. Before going to school or to any meeting, the person should have a certificate from the physician or health officer, setting forth that proper precautions have been taken during the sickness, and that the person is believed to be free from danger of conveying the disease to others.

All persons recovering from diphtheria are dangerous. Dangerous also, and but in a slightly less degree, are all individuals, nurses, attendants, parents, brothers, sisters, other relatives, friends, acquaintances, neighbors, who have come in contact with the patient, or who have been in the infected rooms prior to disinfection of the same, unless their clothing and persons have been disinfected.

In the event of death, the body must be wrapped in a sheet thoroughly soaked in Standard Disinfectant No. 2 and then placed in an air-tight coffin. Public funerals and wakes over such a body are forbidden. *The coffin must not be opened nor the remains again exposed under any pretext whatsoever.* The body cannot be transported by rail unless prepared in accordance with the rules of this Board and placed in an air-tight metallic casket. Newspaper notices of such deaths should distinctly state that the deceased died of diphtheria.

"To the living and not the dead is your duty due."

"There is no relation between the severity of the type of the disease in the individual who is the source of the infection and in the individual who receives it. The lightest case may cause the most malignant, provided the susceptibility or predisposition of the victim who receives the infection is strong. On the other hand, the most severe or malignant case may give rise to a very mild attack in a person whose susceptibility or predisposition is slight."—Twentieth Century Practice of Medicine.

DISINFECTION AFTER RECOVERY OR DEATH.

When an apartment which has been occupied by a person sick with an infectious disease is vacated, it should be disinfected.

The object of disinfection in the sick room is the destruction of infectious material attached to surfaces, or deposited as dust upon window ledges, in crevices, etc. If the room has been properly cleansed and ventilated while still occupied by the sick person, and especially if it was stripped of carpets and unnecessary furniture at the outset of his attack, the difficulties of disinfection will be greatly reduced.

The work of disinfection should begin with the beginning of the treatment of cases, and should continue during the whole course of the disease. All articles of bed clothing and of body clothing should be disinfected as soon as they are removed from the bed or from the patient.

During the entire illness the privy should be thoroughly disinfected with Standard Disinfectant No. 1, four or five gallons of which should be thrown into the vault every day. Instead of the solution, chloride of lime in powder can be used. All woodwork in the vault should be soaked with the solution or covered with powdered lime. Water closets and sinks should be disinfected daily by pouring a quart or more of the solution of chloride of lime or carbolic acid into the pipes. The pipes should be freely flushed in order to avoid injury.

After the patient has been removed from the room, it should be thoroughly fumigated, with all its contents, by burning sulphur or evaporating formaldehyde, and by a thorough cleansing with a disinfectant solution.

"Whatever is Worth Doing is Worth Doing Well."

The following mode of procedure* will be found easy of application, economical and effective:

(a) Have all windows and doors (except doors of egress), tightly closed. Securely paste strips of paper over keyholes, over cracks, above, beneath and at sides of windows and doors, over stove holes and all openings in walls, ceiling and floor. If opening be large, paste several thicknesses of paper over opening. Carefully stop up the fireplace if there be one. There must be no opening through which gas can escape.

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*See pages 22 and 23 for method of disinfection with formaldehyde.

(b) All articles in the room that cannot be washed must be spread out on chairs or racks. Clothing, bed covers, etc., should be hung on lines stretched across the room. Mattresses should be opened and set on edge; window shades and curtains spread out at full length. If there is a trunk or chest in the room, open it, but let nothing stay in it. Open the pillows so that the sulphur fumes can reach the feathers. Do not pile articles together.

(c) Use three pounds of powdered sulphur for every 1,000 cubic feet in the room. A room ten feet long, ten feet wide and ten feet high has 1,000 cubic feet. For a closet, use two pounds of sulphur.

(d) Burn the sulphur in an iron pot or deep pan. Let the pot or pan stand in a large vessel containing water, which vessel should be placed on a table, not on the floor. For example, take a common washtub, lay in it three or four bricks, pour in water to the level of top of bricks, put the pot or pan containing the required amount of sulphur on the bricks, place the washtub and contents on a table. The disinfecting "apparatus" is then in working order.

Moisten the sulphur with alcohol and ignite. When the sulphur begins to burn, leave the room, close the door of egress, and carefully paste strips of paper over the keyhole and all openings above, beneath and at side of door. Keep the room closed for ten hours at least.

Sulphur candles can be used instead of crude sulphur, but care must be taken to use sufficient candles. The average candle on the market contains one pound of sulphur. Three of these will be required in the disinfection of a small room, 10x10x10. Do not use a less number, no matter what directions may accompany the candle. The water-jacketed candle is preferable. Partly fill tin around candle with water and place candle in a pan on the table, not on the floor. Let one-half pint of water be vaporized with each candle. In the absence of moisture, the fumes of sulphur have no disinfecting power.

(e) After the apartments are opened, take out all articles and place them in the sunshine. Carpets should be well beaten and exposed to the sun.

(f) All surfaces in the room should then be thoroughly washed with Standard Disinfectant No. 3. Walls and ceilings, if plastered, should subsequently be washed with lime. Wash well all out-of-the-way places, window ledges, mouldings, etc. Floors, particularly should receive

careful treatment, and the solution should wet the dust and dirt in the cracks.

"Lingering labor often comes to naught."

(g) After washing, ventilate the rooms, if possible, for several hours.

(h) It is safer to burn mattresses and pillows.

(i) It is likewise safer to burn all books, toys and articles of small value which have been handled by the patient. Burn what you cannot boil. Books which have not been handled by the patient can be saved. Lay them on edge on a table with leaves open, in a room while the sulphur is burning.

Unless all precautions recommended have been taken in the sick room, the entire house must be disinfected in the manner directed for the sick room; otherwise a thorough "cleaning house" exposure of all articles to air and sunshine, the beating of carpets, etc., will be all that is necessary. In case the entire house is disinfected, take out before exposure to *sulphur,* any pianos, sewing machines, lace curtains, fine paintings or draperies, and expose them to the sun. Sulphur fumes injure these articles. Formaldehyde does not.

The infection must not remain in the house. It is a menace to the lives and health of the patient, the children, if any, of the family, and your neighbor's children.

There is one serious objection to the use of sulphur, and this must be fully understood. The fumes of sulphur have a destructive action on fabrics of wool, silk, cotton and linen, on tapestries and draperies, and exercise an injurious influence on brass, copper, steel and gilt work. Colored fabrics are frequently changed in appearance and the strength impaired. Curtains and all articles of cotton or linen can be effectually disinfected by boiling or soaking them in Standard Disinfectant No. 3 for several hours, and portable articles of brass, copper, steel and gilt work by washing with a strong solution of carbolic acid (Standard Disinfectant No. 1).

Formaldehyde (the 40 per cent solution) may be used instead of sulphur if desired. See pages 22 and 23 for method of application.

"Whatever thou takest in hand remember the end, and thou shalt never do amiss."

PUBLIC HEALTH LAWS OF ILLINOIS.

EXTRACTS FROM THE REVISED STATUTES.

POWERS AND AUTHORITY OF THE STATE BOARD OF HEALTH.

(Extract.)

The State Board of Health shall have the general supervision of the interests of the health and life of the citizen of the state. They shall have charge of all matters pertaining to quarantine; and 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 public health; and it shall be the duty of all police officers, sheriffs, constables, and all other officers and employes 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. [*Revised Statutes, Chap. 126a, Sec. 2.*]

POWERS OF CITY COUNCILS IN CITIES AND PRESIDENTS AND BOARDS OF TRUSTEES IN VILLAGES INCORPORATED UNDER THE GENERAL LAW.

[*Revised Statutes, Chap. 24, Sec. 62.*]

(Extracts.)

Seventy-fifth—To declare what shall be a nuisance, and to abate the same; and to impose fines upon parties who may create, continue or suffer nuisances to exist.

Seventy-sixth—To appoint a board of health, and prescribe its powers and duties.

Seventy-eighth—To do all acts, make all regulations which may be necessary or expedient for the promotion of health or the suppression of disease.

Eighty-first—To direct the location and regulate the management and construction of packing houses, renderies, tallow chandleries, bone factories, soap factories and tanneries, within the limits of the city or village, and within the distance of one mile without the city or village limits.

Eighty-third—To prohibit any offensive or unwholesome business or establishment within or within one mile of the limits of the corporation.

Eighty-fourth—To compel the owner of any grocery, cellar, soap or tallow chandlery, stable, pig sty, privy, sewer or other unwholesome or nauseous house or place, to cleanse, abate, or remove the same, and to regulate the location thereof.

Ninety-sixth—To pass all ordinances, rules, and make all regulations, proper or necessary, to carry into effect the powers granted to cities or villages, with such fines or penalties as the city council or board of trustees shall deem proper: *Provided,* no fine or penalty shall exceed $200, and no imprisonment shall exceed six months for one offense.

Territorial Jurisdiction—The city council and board of trustees shall also have jurisdiction in and over all places within one-half mile of the city or village limits, for the purpose of enforcing health and quarantine ordinances and regulations thereof. [*Revised Statutes, Chap. 24, Sec. 44.*]

POWERS OF COUNTY AND TOWNSHIP BOARDS OF HEALTH.

[*Act approved May 10, in force July 1, 1901. Amended by act in force July 1, 1903.*]

(Extracts.)

Section 1. *The board of county commissioners in counties not under township organization, and the supervisor, assessor and town clerk of every town in counties under township organization,* shall constitute a board of health, and on the breaking out of any contagious or infectious disease in their county or town, or in the immediate vicinity thereof, it shall be their duty to make and enforce such rules and regulations tending to check the spread of the disease within the limits of such county or town as may be necessary; and for this purpose they shall have power to quarantine any house or houses, or place where any infected person may be, and cause notices of warning to be put thereon, and to require the disinfection of the house or place: *Provided,* that nothing in this act shall apply to any territory lying within the corporate limits of any incorporated city or village: *Provided, further,* that in case the board of health of any county not under township organization, or of any township in counties under township organization shall fail, refuse or

neglect to promptly take the necessary measures to preserve the public health, or in case any such board of health shall refuse or neglect to carry out the rules and regulations of the State Board of Health, that thereupon the State Board of Health may discharge such duties and collect from the county or township, as the case may be, the reasonable costs, charges and expenses incurred thereby.

§ 2. The said board of health shall have the following powers:

First—To do all acts, make all regulations which may be necessary or expedient for the promotion of health or the suppression of disease.

Second—To appoint physicians as health officers and prescribe their duties.

Third—To incur the expenses necessary for the performance of the duties and powers enjoined upon the board.

Fourth—To provide gratuitous vaccination and disinfection.

Fifth—To require reports of dangerously communicable diseases.

§ 3. Any person who shall violate, or refuse to obey, any rule or regulation of the said board of health, shall be liable to a fine not exceeding $200 for each offense, or imprisonment in the county jail not to exceed six months, or both, in the discretion of the court.

All fines collected under the provisions of this act shall be paid into the county treasury of the county in which the suit is brought, to be used for county purposes, and it shall be the duty of the State's attorney in the respective counties to prosecute all persons violating, or refusing to obey, the rules of said local boards of health.

"In nearly all health and quarantine laws some are put to inconvenience and annoyance and many, to a certain extent, are deprived of their liberty and freedom of action. But, if the public necessity requires it, the convenience or even liberty of the individual citizen must give way for the welfare of the greater number. * * * The good of the many must be preferred to the convenience or supposed welfare of the few."—Decision Appellate Court of Illinois, Second district, Lawbaugh vs. Board of Education, 66 Ill. App., 159.

RULES AND REGULATIONS FOR PHYSICIANS AND HEALTH AUTHORITIES.

RECOMMENDATIONS TO PHYSICIANS.

Use Antitoxin Early.

As in the diagnosis of all cases of suspected communicable diseases, great care should be exercised in the diagnosis of suspected diphtheria. Osler says, "When a bacteriological examination cannot be made, the practitioner must regard as suspicious all forms of throat affections in children and carry out measures of isolation and disinfection. In this way alone can serious errors be avoided." This mode of procedure, however, is more applicable to hospital than to private practice.

It is wise for the physician to take into consideration the fact of exposure or non-exposure to the disease, and the prevalence or absence of the disease in the vicinity. If in any case exposure to diphtheria is known to have occurred, even a slightly suspicious sore throat should be regarded as probably a mild diphtheria. If on the other hand, no cases of diphtheria have been known to exist in the neighborhood, the ailment should not be termed diphtheria unless clinical characteristics are obvious.

The most certain evidence of diphtheria is the finding of Klebs-Loeffler bacillus in the membrane, but the absence of diphtheria bacilli in the first culture, especially in cases where the disease is confined to the larynx or bronchi, must not be accepted as conclusive evidence of the non-existence of diphtheria, particularly if there be a striking discrepancy between the clinical and the bacteriological diagnosis. The bacilli may be found abundantly in the second culture.

☞Remember that the Laboratory of the State Board of Health at Springfield is ready, at all times, to afford aid to physicians in establishing diagnoses. Bacteriological examinations are made free of cost.

When the facilities for making a bacteriological examination are not at hand, or it is not practicable to send a specimen of the membrane to the State Board of Health, dependence must be placed upon the clinical symptoms. There are but two conditions with which diphtheria is liable to be confounded, viz., the different forms of diphtheroid faucitis, including follicular tonsilitis, and scarlatina. Scarlatina and diphtheria may co-exist, but such cases are exceedingly rare. Scarlatina leads more or less to temporary damage to the mucous membrane of the throat, and in this manner predisposes to the reception of the diphtheria poison, causing a series of diphtheria cases to follow after a series of scarlatina cases.

The diagnosis of a typical pharyngeal diphtheria (the usual form prevailing) will not ordinarily be found difficult if careful attention be given to the history of the case, the constitutional disturbances, the appearance and characteristics of the membrane and exudates and the occurrence of albuminuria. To the seat of the membrane, especial attention must always be given, as to the firm incorporation, in diphtheria, of the exudate with the underlying mucous membrane.

Membranous Croup.—Unless it has been determined by bacteriological tests that the disease is non-diphtheritic, all cases of so-called membranous croup should, in the interest of the public health, be considered diphtheria, for sanitary purposes at least, and should be so reported. It is well known that with a very large proportion of all cases of membranous laryngitis, the Klebs-Loeffler bacillus is associated, whether an exudate is present in the pharynx or not, and it is practically impossible to make a positive diagnosis without a bacteriological test. In view of these facts the public safety demands that the same preventive measures be applied to cases of membranous croup as to cases of recognized diphtheria. It must be remembered that in laryngeal diphtheria, i. e., membranous croup, the diphtheria bacillus nearly always produces its influence first on the mucous membrane of the larynx, and in these cases the mucous membrane of the nose and pharynx may never show any evidence of membrane.

Use Antitoxin Early.

On being satisfied that diphtheria exists in a family, the attending physicians should direct the observance of all precautions necessary to prevent the further spread of the disease, and should AT ONCE REPORT the case or cases to the local board of health, if there be one, if not, to the legally constituted health authorities.

The physician should avoid carrying infection. A very leading manner of the conveyance of the bacillus is by *fomites*. The contagion adheres tenaciously to a great variety of objects, and has been transferred in clothing over great distances, giving rise to the disease long after. The physician should thoroughly disinfect all instruments used on a patient and should, especially after close contact with the patient, wash his hair and all exposed cutaneous surfaces with a germicidal solution and thoroughly brush his clothing with a whisk broom wet with the solution.

On the recovery of the patient the attending physician should notify the local health authorities, in order that the quarantine restrictions can be removed. The physician should also impress upon the local health authorities the absolute necessity for a thorough disinfection of the infected room or rooms, if he has reason to believe that this important feature of preventive medicine will be overlooked.

Use Antitoxin Early.

DUTIES OF LOCAL HEALTH AUTHORITIES.

Isolate, Quarantine, Disinfect.

Whenever a case of diphtheria or membranous croup is reported, the local health officer, if there be one, or a physician appointed by the city, village or town authorities; should visit the premises and secure prompt compliance with the precautions herein enjoined. Every infected house should be properly placarded, and all children therein confined to the immediate premises during the prevalence of the disease, and steps should be taken to prevent all unauthorized persons, especially children, from visiting the premises. Adults from the infected house should be prohibited from mingling unnecessarily with other people, above all with children, and should be required to disinfect their clothing before going out of the house.

Prompt reports of the existence of diphtheria in a family should be furnished to all public libraries, and care should be taken that no book from the infected premises be returned to the libraries.

It is not considered necessary to close the schools during the prevalence of diphtheria in a community unless it prevails in epidemic form, but all schools in the neighborhood should be notified of the existence of the disease, and should any children affected with diphtheria have attended school, the school should be promptly closed until disinfected.

It is imperative that similar notice be sent also to the superintendents of all Sunday schools, or to the pastors of the churches, for there is no question but that the liability of the dissemination of contagious diseases is greater in Sunday schools, which are used but once a week, than in public schools, which are cleaned and ventilated daily. As a further precautionary measure the local health authorities should see that rooms used for Sunday school purposes be kept in a sanitary condition and freely ventilated at intervals during the week.

Overdo rather than underdo!

When should the patient be released from quarantine? The time is variable, depending entirely upon the character of the disease, and the presence or absence of complications.

Health officers will ordinarily be justified in raising the quarantine whenever the attending physician certifies that the patient has entirely recovered from diphtheria; that there is no danger of spread of the infection from the patient. As a rule, however, the minimum length of quarantine should be two weeks. In very mild cases, and particularly when antitoxin has been administered, the quarantine may be raised within ten days, provided the physician furnishes the certificate required, and especially if a bacteriological examination of the throat shows no evidence of the presence of the bacilli of diphtheria.

The quarantine should not be raised, however, until the infected room, and if necessary the entire house, has been properly disinfected.

On receiving a certificate from the attending physician that the patient has entirely recovered, and that no further quarantine is necessary, the local health officer should see that the infected room and premises, if thought necessary, with contents, be DISINFECTED as directed herein. To be effective, the disinfection must be thorough. "There can be no partial disinfection of infectious material; either its infectious power is destroyed or it is not. In the latter case there is a failure to disinfect." Deodorants merely remove offensive odors, and may not have any disinfecting power whatever. A

failure to properly disinfect apartments often leads to the recurrence of the disease.

The bacilli of diphtheria will live on infected substances for weeks. They have been known to live for several months on children's playthings which have been put away.

In the disinfection of school rooms the burning of sulphur is usually advisable. This fumigation should always be followed by thorough airing for several hours. The floors and all furniture should be washed with a germicidal solution, preferably Standard Disinfectant No. 3.

Disinfect.

Local boards of health and health officers should guard against the introduction or spread of contagious disease by the exercise of proper and vigilant inspection and control of all persons and things coming within their jurisdiction. They should require prompt reports of all infectious and contagious diseases and the isolation of all persons and things infected with or exposed to infectious or contagious diseases, and should placard and disinfect infected premises, close schools and assume charge of funerals, if necessary. They should also cause the arrest and imprisonment of all persons violating their orders. The authorities may, in general, take any measure of precaution, however stringent, which they may deem necessary or prudent in the interest of the health of the inhabitants. "The health of the people is the supreme law."

There is no more liberal law or charter in existence than is given to the councils of cities and the trustees of villages by section 62, chapter 24, of the Revised Statutes, for the almost absolute and unrestrained control of the agencies affecting the public health. Concerning the force and effect of such, the Supreme Court of Illinois, in the case of Mason *et al.* vs. The City of Shawneetown, 77 Ill. 533, says: "Where an incorporated town or city has been invested with power to pass an ordinance, by the Legislature, for the government or welfare of the municipality, an ordinance enacted by the legislative branch of the corporation in pursuance of an act creating the corporation, has the force and effect of a law passed by the legislature, and cannot be regarded otherwise than as a law of and within the corporation. An ordinance is the law of the inhabitants of the municipality."

Disinfect.

"Do it now," and "Do it right."

The thorough disinfection of infected apartments or dwelling is as important as the maintenance of an efficient quarantine during the prevalence of the disease. Hence, no agent should be employed in the effort to destroy the germs of disease, upon the efficiency of which, under all circumstances, there rests any doubt or uncertainty. The use of a worthless disinfectant or the misuse of a valuable one not only involves a waste of time and material, but jeopardizes the health of the community.

Disinfection of an infected apartment can be successfully performed by thoroughly wetting the floors, ceilings, walls and all exposed surfaces with an efficient germicidal solution. This method, however, is not applicable to the contents of the apartment. For these fire is the most reliable disinfectant, yet, as other reliable disinfectants are available, there is little justification for the burning of any article of value, except, for instance, books or mattresses or pillows, which cannot be successfully disinfected except by steam.

All infected apartments, with contents, should be disinfected by an efficient aerial germicide, and this fumigation should be followed by a thorough washing of the walls, ceilings, floors and exposed surfaces of the room with a reliable disinfecting solution.

Fumigation by burning sulphur has for many years been a favorite method of aerial disinfection. As stated in the recently revised Prize Essay of the American Public Health Association, on "Disinfectant and Individual Prophylaxis Against Infectious Diseases," by Surgeon General George M. Sternberg, U. S. A., "the experience of sanitarians is in favor of its use in yellow fever, small-pox, scarlet fever, diphtheria and other diseases in which there is reason to believe that the infectious material does not contain spores." In the majority of the infectious diseases the specific germ does not form resistant spores, hence sulphur dioxide would seem to be a reliable aerial disinfectant. It must be remembered also that some authorities do not subscribe to the statement that sulphur is powerless to destroy pathogenic organisms containing spores.

Admitting the impotency of the fumes of sulphur dioxide under certain conditions, and the fact that they may not kill the spores of anthrax or other bacilli, "there is no reason," as stated by Dr. Sternberg, "for rejecting an agent which has been demonstrated by experience to

be one of great value, which has been proved by laboratory experiments to be fatal to pathogenic organism in the absence of spore and to destroy the infecting power of vaccine virus."

Sulphur will be found a thoroughly reliable gaseous disinfectant* of considerable penetrating power if it is intelligently employed. To obtain satisfactory results, the following essentials of successful disinfection, established by repeated experiments, must be observed: (a) The infected room, or rooms, must be thoroughly closed, every crack and crevice sealed. (b) Sufficient sulphur must be used. (c) There must be ample moisture in the room. (d) The time of exposure must be sufficient, ten hours the minimum.

In the disinfection of stores, halls, school houses and apartments or dwellings in which there are no articles to be injuriously affected by the gas, sulphur is an ideal disinfectant. Its mode of application is simple (the simpler the mode of application, the better); it is cheap; the material is accessible everywhere, and, finally, the most important of all, the action will be invariably found effective when the sulphur is properly used.

During recent years, formaldehyde gas has, to a very considerable extent, taken the place of sulphur dioxide as a gaseous disinfectant. Various methods for the use of formaldehyde have been devised—all requiring apparatus more or less expensive and complicated—all exploited with extravagant claims of merit and infallibility. None of these, however, has proven worthy of the claims made for it, while many have been entirely worthless. The fact that the vast majority of devices, at one time exploited and enjoying wide popularity, and widely purchased by confiding health officers, have been eventually relegated to the junk heap, indicates clearly the failure of former methods of formaldehyde disinfection to meet the requirements upon them.

"Any man may make a mistake, but none but a fool will continue in it."

Almost continuously since 1897 the State Board of Health has experimented with and investigated the merits of formaldehyde. Every device and every apparatus coming to the attention of the Board has been fairly and thoroughly tested. In view of the results obtained with all,

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*See page 9 for simple method of application.

the State Board of Health has been unable to recommend formaldehyde disinfection in the past, and is only able to recommend it now when employed with *one* method in a proper apparatus.

The method now unreservedly recommended by the Board consists merely in pouring formaldehyde solution over crystals of potassium permanganate. This method primarily offers the advantage of absolute simplicity in operation, requiring no special apparatus and no fire. In addition to this, exhaustive experimental work has demonstrated that, in practical disinfection, the method is unusually efficient, regardless of the conditions of humidity, temperatures and other factors which materially affect other methods of the use of formaldehyde.

The only apparatus required is a large open vessel, protected by some non-conductive material to prevent the loss of heat from within. An ordinary milk-pail, set into a pulp or wooden bucket, will answer every purpose, although a special container, devised for physicians and health officers, will be found of considerable advantage. This container or generator consists of a simply constructed tin can with broad, flaring top. Its full height is 15½ inches, the height from the bottom to the flaring top being about 8 inches. The lower or round section is 10 inches in diameter, while the flaring top is 17½ inches in diameter at its top. The container is made of a good quality of bright tin, is supplied with a double bottom with ¼ inch air space between the two layers, and is entirely covered on sides and bottom with asbestos paper. The asbestos paper and double bottom serve effectively to retain the heat which is generated by the vigorous chemical reaction occurring within, and which is essential to the complete production and liberation of the gas. This special container can be made by any tinner of ordinary intelligence and costs but a few dollars. It is illustrated on page 24.

With the room sealed, as described on page 9, and, as is essential to any form of aerial disinfection, the crystals of potassium permanganate (6¾ ounces to each 1,000 cubic feet of room space, or 10 ounces when the temperature is below 60° F.) are placed in the container. Over this salt is poured "formalin," or the 40 per cent aqueous solution of formaldehyde (16 ounces to every 1,000 cubic feet of room space, or 24 ounces when the temperature is below 60° F.). The formaldehyde gas is promptly liberated by the vigorous chemical reaction of the formalin and potassic salt and rises from the generator in immense

volume in the form of an inverted cone. It is consequently necessary that all preparations be made in advance, and that the operator leave the room at once on the combination of the two chemicals.

The door or window of exit will be promptly closed and sealed, and the room left closed for at least four hours.

As in all methods of disinfection, success largely depends upon the care which is exercised and the attention which is given to every detail. Simple as the method is, neglect of any of the following points may result in complete failure:

The sick room is not the place for experiments.

1. The room should be sealed and prepared as described on page 9.

2. The potassium permanganate (6¾ ounces to every 1,000 cubic feet of room space, or 10 ounces at temperature below 60° F.) should be placed in the apparatus or generator. *The permanganate must be put in before the formaldehyde solution.*

3. The 40 per cent formaldehyde solution (16 ounces to the 1,000 cubic feet of room space, or 24 ounces at temperature below 60° F.) should then be poured over the permanganate.

4. As the gas is given off in immense volume immediately after the mixture of the formaldehyde and permanganate, the operator must leave the room at once. All preparations must have been finished in advance.

5. The door or window of exit must be promptly closed and sealed, so that there will be no escape of gas, and the room should be left closed for four hours.

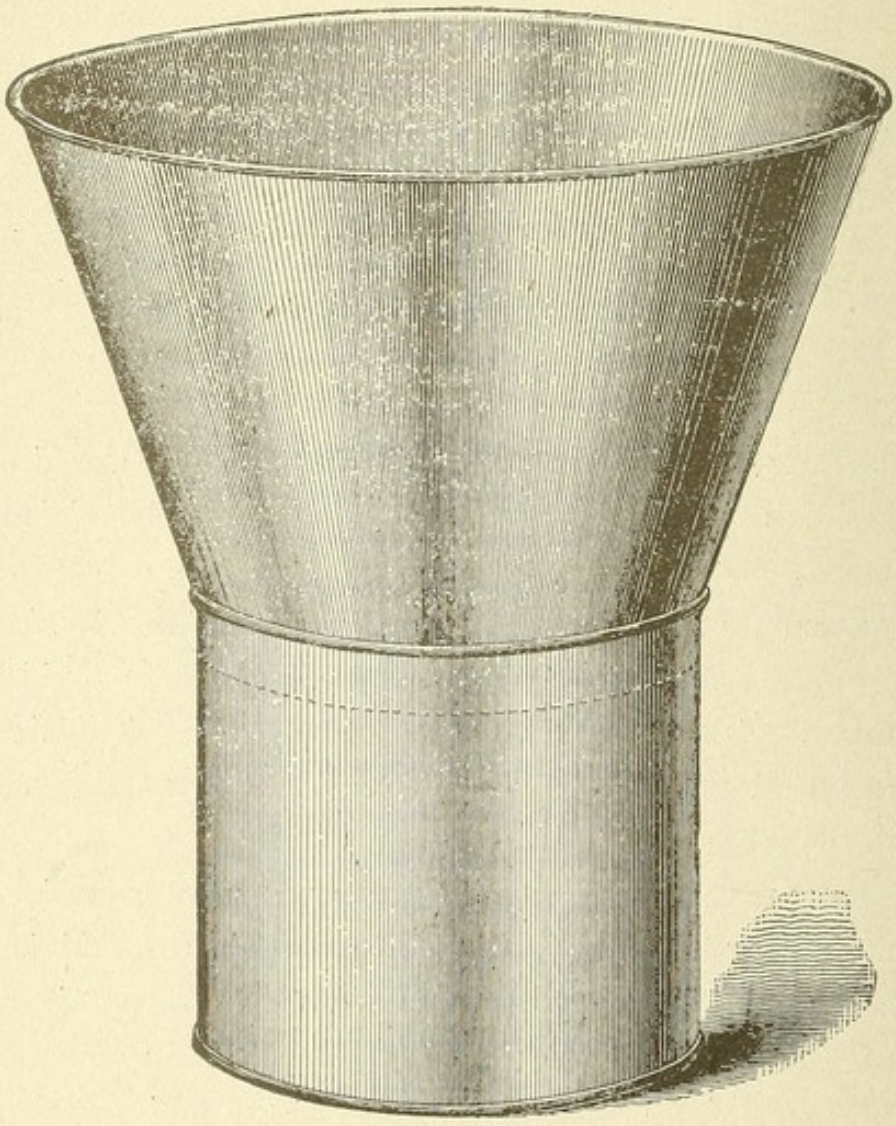
6. The room should be thoroughly cleaned after disinfection. All out-of-the-way places, window ledges, mouldings, etc., should be washed with Standard Disinfectant No. 3 (see page 26). The floors should receive careful attention and the solution should thoroughly wet the dust and dirt in the cracks.

Whenever practicable the special generator previously described should be used, and health officers and physicians should have several such containers on hand. In the absence of such a container, however, a milk pail may be used, as indicated on page 22. In an emergency use any tin pail or crock, of proper size, but be sure and *well heat* the pail or crock before putting in the chemicals. This heating is very important to the proper generation of the gas.

Care must be taken not to place too much formaldehyde in a single container. The reaction is violent and there is great effervescence and bubbling. If the room is too large to be disinfected with one generator, use as many more as are required and place in each only a reasonable amount.

The following quantities may be used safely in the containers recommended:

10 or 12 quart milk-pail,	Formaldehyde, 16 ounces;
	Permanganate, 6¾ ounces.
14 quart milk-pail.	Formaldehyde, 24 ounces;
	Permanganate, 10 ounces.
Special apparatus described on page 22, and illustrated below.	
	Formaldehyde, 32 ounces;
	Permanganate, 13½ ounces.



CONTAINER FOR GENERATING FORMALDEHYDE GAS.
(Formaldehyde-Potassium permanganate method.)

Larger quantities than these should not be used.

If good results are to be attained, care must be exercised to secure the best quality of formaldehyde solution. Secure the highest grade 40 per cent aqueous solution on the market. Good formaldehyde is not expensive. Inferior formaldehyde is dear at any price. Its use may bring about most unfortunate results.

The fine, needle-shaped crystals of potassium permanganate are better than the rhomboid crystals. See that you get crystals of potassium permanganate. Do not accept the dust, which often contains impurities.

Prepare the room and its contents as described on pages 9 and 10, but remember that books cannot be disinfected with formaldehyde gas.

Don't use "Formaldehyde Candles." Don't rely on the apparatus which the energetic and anxious-to-make-a-sale tradesman tells you is better than that recommended by the State Board of Health.

Entire dependence should not be placed upon any aerial disinfectant, even though its penetrating power be great. There should be a thorough "house cleaning" after the exposure to the gas, and the liberal application of a solution of corrosive sublimate to all exposed surfaces in the room and a thorough outdoor airing of its contents.

* * *

A copy of this circular, liberal supplies of which can be secured on application to the Secretary of the Board at Springfield, should be furnished to every family in which there is a case of diphtheria or "sore throat," and to other families which may have been exposed to the disease, and also to teachers of public and private schools and pastors of churches.

If the spirit of the rules and regulations of the State Board of Health be complied with, the disease can be easily controlled and speedily suppressed.

Published by order of the State Board of Health.

JAMES A. EGAN, M. D.,

Secretary.

STANDARD DISINFECTANTS.

The following are simple, cheap and reliable disinfectants.

STANDARD DISINFECTANT NO. 1.

Dissolve chloride of lime of the best quality in water, in the proportion of six ounces to the gallon.

Use one quart of this solution for each discharge from a patient suffering from a contagious or infectious disease. Discharges from the mouth and throat should be received in a cup half full of the solution, and those from the nostrils upon soft cotton or linen rags, which should be immediately burned.

The chloride of lime must be of the best quality. Poor chloride of lime is worthless. The solution should be made when required.

Instead of chloride of lime, carbolic acid may be used in the strength of six and one-half ounces to the gallon of water.

STANDARD DISINFECTANT NO. 2.

Dissolve corrosive sublimate and muriate of ammonia in water in the proportion of two drachms (120 grains—$\frac{1}{4}$ ounce) of each to the gallon. Dissolve in a wooden tub, barrel or pail, or an earthen crock.

Use for the same purposes and in the same way as No. 1. Equally effective, but slower in action. This solution is odorless, while the chloride of lime solution is often objectionable in the sick room on account of its smell.

STANDARD DISINFECTANT NO. 3.

Dissolve one drachm (60 grains—$\frac{1}{8}$ ounce) of corrosive sublimate and muriate of ammonia in one gallon of water. Dissolve in a wooden tub, barrel or pail, or an earthen crock.

Use for the disinfection of soiled underclothing, bed linen, etc. Mix solution and immerse articles for two hours. Then wring them out and boil them.

Mixed with an equal quantity of water the solution is useful for washing the hands and general surfaces of the bodies of attendants and convalescents. The latter only by direction of the physician.

Good chloride of lime should contain at least 25 per cent of available chlorine. It may be purchased by the quantity at 3½ cents per pound. The cost of the standard solution recommended is therefore about 1 cent a gallon. A clear solution may be obtained by filteration or by decantation, but the insoluble sediment does no harm, and this is an unnecessary refinement.

☞ Chloride of lime, carbolic acid and corrosive sublimate are *deadly poisons.*

☞ Solutions of corrosive sublimate must not be made or kept in a metal vessel. Use a *wooden* tub, barrel or pail or an *earthen* crock.

☞ Solutions of chloride of lime, carbolic acid and corrosive sublimate will injure lead pipes if passed through them in large quantities without free flushing.

Standard Disinfectant No. 4.

Milk of Lime (Quick Lime).

Slack a quart of freshly burnt lime (in small pieces) with three-fourths of a quart of water—or, to be exact, 60 parts of water by weight with 100 of lime. A dry product of slack lime (hydrate of lime) results. Make milk of lime not long before it is to be used by mixing one part of this dry hydrate of lime with eight parts (by weight) of water.

Air-slacked lime is worthless. The dry hydrate may be preserved some time if it is enclosed in an air-tight container. Milk of lime should be freshly prepared, but may be kept a few days if it is closely stoppered.

Quick lime is one of the cheapest of disinfectants. The solution can take the place of chloride of lime, if desired. It should be used freely, in quantity equal in amount to the material to be disinfected. It can be used to whitewash exposed surfaces, to disinfect excreta in the sick room or on the surface of the ground, in sinks, drains, stagnant pools, etc.

IMPORTANT NOTICE.

The Illinois State Board of Health has published a circular on the CAUSE AND PREVENTION OF CONSUMPTION, a preventable and curable disease, but one which kills between 8,000 and 9,000 persons in Illinois every year,—kills men and women in their prime.

This circular contains chapters on the following subjects: THE CAUSE OF CONSUMPTION, THE SYMPTOMS OF CONSUMPTION, HOW TO AVOID CONSUMPTION, HOW THE SPUTUM MAY BE DESTROYED, IF YOU HAVE CONSUMPTION, THE HYGIENE OF THE SICK-ROOM, CONSUMPTION IN SCHOOLS, AS TO CHANGE OF CLIMATE, AND AS TO THE TREATMENT OF CONSUMPTION IN ILLINOIS.

Copies of this circular will be sent free of charge to any resident of Illinois who applies to the Secretary at Springfield.

☞In consumption, as in all diseases, it is essential that the premises be kept in a sanitary condition. All decaying animal and vegetable matter and every kind and source of filth in and about the house should be removed and disinfectants freely used. Surface drains and gutters, out houses, privies, shelters for domestic animals, fowls, etc., and basements and cellars should receive close and constant attention and Standard Disinfectants No. 1 or 4 should be used freely and regularly in such cases.

The Illinois Circular on Consumption.

"We have received a copy of a circular just issued by the Illinois State Board of Health on 'The Cause and Prevention of Consumption.' We regard it as the most complete and compact statement of the cause and prevention of this all-too-universal and fatal disease that we have seen. If a copy of it could be put in every home in the land and was read and its precepts heeded, consumption would be reduced fifty per cent in ten years."—From Iowa Health Bulletin, August, 1904, published by the Iowa State Board of Health.