Suggestions relative to

SUGGESTIONS

RELATIVE TO

EPIDEMIC CHOLERA

AND THE

USE OF CORROSIVE SUBLIMATE,

THE BEST GERMICIDE.

SECOND EDITION.

SURGEON GEN'L'S OFFICE
174
LIBRARY

SAN FRANCISCO:
1884.

With the Compliments of

James B. Randol,

New Almaden, California.

SUGGESTIONS

RELATIVE TO

EPIDEMIC CHOLERA

AND THE

USE OF CORROSIVE SUBLIMATE,

THE BEST GERMICIDE.

SECOND EDITION.

SURGEON GEN'L'S OFFICE
LIBRARY

SAN FRANCISCO:
1884.

SUGGESTIONS RELATIVE TO EPIDEMIC CHOLERA.

The Massachusetts State Board of Health has issued a circular under the above title. It contains an excellent account of the measures to be taken by individuals and municipalities in order to prevent cholera. The following disinfectants are recommended: For clothing, towels, bedding, and other textile fabrics, *a solution of bi-chloride of mercury, 1 part to 1,000;* carbolic acid, 1 part to 30 of water. Subjecting to a temperature of at least 212° F. (100° C.) for half an hour, either by boiling or baking, is recommended as quite efficient when practicable. It would be better still to burn all soiled clothing. For water-closets, urinals, sinks and cesspools: *Solution of bichloride of mercury (corrosive sublimate), 1 part to 1,000 of water;* solution

*** *The Medical Record*, New York, August, 1884.

of carbolic acid, 1 part to 30 or 40 of water; solution of chloride of zinc, 1 part of liquor zinci chloridi, U. S. P., to 200 of water. For the disinfection of excreta, the choleraic discharges should receive special attention. It is therefore recommended that such discharges be received in metallic or earthen vessels, and *treated with the solution of bi-chloride of mercury, 1 to 1,000*, or by the chloride of zinc solution. Undoubtedly the better mode of treating the discharges is by complete destruction by fire. For this purpose, when practicable, the erection of small furnaces, stoves or crematories is desirable wherever cholera hospitals are established. In consequence of the fluidity of the excreta, it would be preferable to receive them into sawdust, or other light combustible material previous to burning. *Bodies of persons deceased from cholera should be wrapped in cloths saturated in a solution of bi-chloride of mercury previous to burial.* For the disinfection of houses sulphur is recommended, as advised in previous circulars of the Board.

Effective disinfection by burning sulphur requires eighteen ounces to each space of one thousand cubic feet. The sulphur should be broken in small pieces, burned over a vessel of water or sand, so as to avoid danger from fire, and if the room is large, it should be put in separate vessels in different places. The room should be tightly closed for six hours, and then aired; it is better that the room should be warm than cold.

DR. KOCH ON THE CHOLERA AND THE COMMA BACILLUS.

An important conference upon cholera was held in Berlin, at the office of the Imperial Board of Health, on July 26, the proceedings of which appear in full in the *Berliner klinische Wochenschrift* of Aug. 4, and have been translated in *The Lancet* of August 9. There were present Drs. v. Bergmann, Coler, Eulenberg, B. Fränkel, Gaffky, Hirsch, Koch, Leyden, S. Neumann, Pistor, Schubert, Skreczka, Struck, Virchow, and Wollfhügel.

Koch found that the addition of an aqueous solution of iodine (1 in 4,000) to meat infusion, in the proportion of 1 in 10, did not in the least interfere with the growth of the bacilli in that medium. He did not pursue this line of inquiry, seeing that in practice larger quantities of iodine than that could not be given. Alcohol first checks the

*** *The Lancet*, London, August, 1884.

development of the comma-bacilli when it is mixed with the nutrient fluid in the proportion of 1 in 10, a degree of concentration which renders it impracticable for treatment. Common salt was added to the extent of 2 per cent. without influencing the growth of the bacilli. *Sulphate of iron*, in the proportion of 2 per cent., *checks* this growth, probably by precipitating albuminates from the fluids, and possibly also by its acid reaction; *certainly it does not seem to have any specific disinfecting action*—i. e., *in destroying the bacilli. Indeed, Koch thinks that the admixture of sulphate of iron with fecal matter may arrest putrefaction and really remove what may be the most destructive process to the comma-bacilli. Hence, he would distinguish between substances which merely arrest putrefaction and those which are bactericidal: for the former may simply serve the purpose of preserving the infective virus.* Among other substances which prevent the growth of the comma bacilli may be mentioned: alum, in solutions of the strength 1 in 100; camphor, 1 in 300;

carbolic acid, 1 in 400; oil of peppermint, 1 in 2,000; sulphate of copper, 1 in 2,500 (a remedy much employed, but how much would really be needed merely to hinder the growth of the bacilli in the intestine!); quinine, 1 in 5,000, *and sublimate, 1 in 100,000.*

CHOLERA DISINFECTION.

We have given briefly in these columns the means to be employed to prevent the introduction of cholera into the United States, and we now invite the attention of our readers to the best means of combating the disease should it once obtain a foothold here. It is understood, from what has already been said, that municipal cleanliness is absolutely necessary to prevent the germs of the disease from multiplying outside the human body, and the only question with which we have now to deal is, what is the best plan that can be adopted to destroy the germs as they pass from the cholera infected person?

Cholera is not transmitted by contact, but by an organic infecting matter, passed with the evacuations of those infected, which must gain entrance into the intestinal canal to produce cholera in another. In this lies the whole secret of an effectual preventive treat-

*** *Medical News*, Philadelphia, August, 1884.

ment, if we can destroy the organic infecting matter the instant it has passed from the patient, cholera cannot spread; or, what amounts to the same thing, if we can prevent the infecting matter of the cholera dejecta from reaching the intestines of other persons, we prevent them from getting cholera. Our efforts in this direction, therefore, constitute the true preventive treatment of the disease. If we can only preserve the drinking water from contamination, it is impossible for cholera to become epidemic. The leading principles upon which we must rely for effecting this object are, first, to destroy the organic infecting matter as it passes away from the patient by means of *a solution of corrosive sublimate*, or of sulphate of iron, or by some acid reagent, taking care that the evacuations thus treated are buried in the earth away from wells or sources of water supply; and secondly, to disinfect or destroy all articles of clothing, furniture, or, in fact, anything to which the choleraic discharges could adhere.

The popular idea of a disinfectant is a something which will destroy a "bad smell," while the fact is, such destruction may not affect the fomites of cholera, which are almost odorless. *A cholera disinfectant must be a germicide, or it is worthless.*

The simplest and cheapest disinfectant for this purpose is *a solution of bichloride of mercury*, or a saturated solution of sulphate of iron (copperas). *A solution of bichloride of mercury is readily made by adding an equal quantity of common salt as a solvent and dissolving in water in the proportion of 1 gramme of the mixture to 1,000 cubic centimetres of water, or 1 ounce to 8 gallons of water;* and a saturated solution of copperas by dissolving all the powdered copperas a given quantity of water will take up. Both of these disinfectants are entirely odorless, and the former colorless.

A small quantity of either of these solutions should be placed in the vessel receiving the discharges from a cholera patient, and another portion poured over them immedi-

ately after the vessel is used. Then the contents of the vessel should be emptied into the water closet, buried, or, better still, thrown into a furnace. All clothes or other domestic articles that can be washed which have been contaminated, should be soaked in a solution of one or the other of these disinfectants, and if the furniture or floor has received any of the fomites, it too *should be thoroughly washed with the bichloride solution.* These solutions can be used about the premises, if necessary, with a sprinkling-pot, and all suspicious places wet down and thoroughly disinfected.

There are many other cheap disinfectants, but they are open to the objection of disagreeable vapors, such as chloride of lime, carbolic acid, sulphurous acid, etc. *The bichloride solution, besides being odorless, is no more dangerous than any other disinfectant that can be named, while it is more cleanly and quite as readily prepared, as well as being cheaper than the now favored carbolic acid.*

Isolated hospitals for cholera patients who

are unable to provide for themselves, and their immediate removal to those hospitals upon the appearance of the first symptom—the *malaise*, which usually precedes cholera—would simplify the management of the disease, and with absolute cleanliness, proper disinfection, a well-regulated diet, and unpolluted water, all fear of an *epidemic* of cholera in the United States may be dismissed, even should it escape our quarantine guards and appear in our midst.

A NEW DISINFECTANT.

Carbolic Acid Superseded by Mercuric Bichloride.

In view of the fact that letters complaining of the intolerable suffering occasioned by the use of carbolic acid in the disinfection of ships in quarantine, under the powerful vaporizing influence of a July sun, have lately been received from captains of vessels detained at the quarantine station, a reporter of the *Times-Democrat* yesterday called on Dr. Joseph Holt, president of the Board of Health, to inquire from him the grounds of such complaints, and his opinion concerning this agent, as used at the quarantine station. The Doctor replied that he considered the visit of the reporter as most opportune, inasmuch as he felt satisfied that the complaints made against the relics of antiquated methods, handed down to the present board

*** *New Orleans Times-Democrat*, July, 1884.

were unfortunately well founded, and also in view of the fact that he had just dispatched a letter to the quarantine physician, giving instructions for the immediate discontinuance of carbolic acid at the quarantine station.

The reporter then requested the Doctor to state his views in regard to the merits of carbolic acid as compared with other disinfecting agents which might be used. In reply, the Doctor said:

"Carbolic acid, as a disinfecting agent wherewith to combat pestilential diseases, has been theoretically held in high esteem for many years. When I returned to this city at the close of the war, I found it making its way into scientific favor as the great agent of prevention. Since that time no remedy ever suggested has had such a fair and unlimited trial as carbolic acid, and as far as the experience of the people of Louisiana is concerned, no other agent could have given such complete disappointment and universal misery with so little good. The grand experiment in the trial of this substance reached its

climax and demonstrated its absolute failure in the attempt to stamp out (as they ridiculously use this term) the epidemic of 1878. Since that time carbolic acid has been steadily and rapidly declining in scientific and public favor here in Louisiana as a disinfectant.

"We have gained the experience that England and the Continent have yet to learn as to the prophylactic powers of this repulsive chemical. Unfortunately, the present Board of Health found carbolic acid, the malodorous and ubiquitous disinfectant, retained at our quarantine stations. The Board of Health, recognizing the degraded power of carbolic acid as one of the lowest orders of germicidal agents, and recently made aware of the suffering on shipboard in quarantine due to its use under the intense vaporizing power of a July sun, has determined to abolish it utterly from reasons of inefficiency and on the score of humanity.

"*In its place we will hereafter use bichloride of mercury, the most powerful germicide known, next to pure bromine, which is impracticable.*

"While carbolic acid, to produce a given effect on choleraic microbes and other dangerous microphytes, must be used in a strength of 1 to 200 of water, *the mercuric bichloride will produce the same effect when diluted 1 to 20,000. Besides this, which makes it the master disinfectant, in solution it possesses neither smell nor color.* A handkerchief washed in a mild solution would be as immaculately white and pleasant to the sense of smell as if washed in the purest spring water, yet endowed with supreme power as non-infectious.

"The ballast, hold and decks of a ship sprinkled with its solution would be as harmless to those on board as the white lead in the paint applied to a ship after it had dried. Strenuous objections will be raised against this agent by carping irresponsible theorists, who draw upon their imagination for their facts merely to combat for the sake of combating. Even when applied in a strong solution to the unabraded skin or administered internally, the bichloride of mercury is recog-

nized by all surgeons and gynæcologists as the least liable to produce the harmful specific effects of this metal. As we propose to use it for disinfecting purposes in quarantine, it is absolutely innocent as compared with carbolic acid.

"I have ordered the immediate discontinuance of the use of carbolic acid at the quarantine station, and *have substituted the mercuric bichloride. The cost is about 80 per cent. in favor of the latter.* The standard solution shall be six ounces of this chemical, with four ounces of the muriate of ammonia as a solvent, first dissolved in a half gallon of water and added to forty gallons of water, a little more than one part in 100."

PRECAUTION AGAINST CHOLERA.

The Enforcement of Sanitary Laws—Dr. Meares' Circular.

Health Officer Meares, of San Francisco, has issued a circular to the public. A general observance of its requirements throughout the State may do much good, but the Doctor does not appear to be conversant with what are recognized as the most efficient disinfectants. He does not mention the well-known and useful carbolic acid, nor *what the best scientific authority advises as superior to all other disinfectants, namely, bichloride of mercury, or corrosive sublimate,* a preparation made from quicksilver. In a day or two we shall give some valuable particulars regarding this disinfectant, *which is not a palliative, but a destroyer of cholera germs.* Dr. Meares' circular is as follows:

*** *San Jose Daily Mercury*, August, 1884.

In view of the epidemic of cholera now prevailing in France, its probable extension to other countries in Europe, and its possible introduction into our Atlantic States, our local Board of Health have deemed it necessary to take active measures to enforce in this city those sanitary regulations which are necessary to exclude, if possible, this terrible scourge, and if not possible to exclude it, then modify and lessen, as far as possible, its malignancy. The Board of Health, the Board of Supervisors and our Police Department upon this subject are in entire accord. Our sanitary laws will be immediately and efficiently enforced. The assistance of all good citizens is earnestly invoked to aid the authorities in this good work.

You are particularly requested to see that your premises are put and kept in the most cleanly condition. Garbage of all kinds should be removed at least twice a week. Privy vaults, kitchen sinks and cesspools should be thoroughly deodorized and disinfected weekly. Your cellars should be thor-

oughly ventilated by opening doors and windows. Their sanitary condition can be much improved by whitewashing and sprinkling unslacked lime or chloride of lime in moist places.

The most effective deodorizer and disinfectant for privy vaults, sinks, cesspools, soiled vessels or decaying animal and vegetable matter is a solution of copperas (three pounds to two gallons of water).

Garments soiled by infectious or contagious diseases should be soaked in a solution of sulphate of zinc (white vitriol), half a pound to three gallons of water, before washing.

All houses, after the occurrence of contagious diseases, should be thoroughly disinfected; but as this requires more or less expert knowledge, those desiring such disinfection should always obtain the same by application to the Health Office, free of cost.

We have good food, fair water and a healthy temperature, and we only require ordinary

attention to sanitary laws to escape much of the sickness now prevailing, and to materially lessen our death rate.

The disinfectants recommended are, when obtained from wholesale druggists, so inexpensive as to be within the reach of every one, and will add much both to comfort and health.

While it is not contended that they destroy the germs of cholera, or any other malignant disease, we do contend that they act as palliatives and correctives, and neutralize disease producers, and those decaying elements of animal and vegetable matter upon which epidemic diseases feed, and by which their germs are multiplied.

It is to be hoped that householders will attend to these simple sanitary regulations, and report to this office all violations of sanitary laws that come within their knowledge.

Every house in the thickly populated portions of the city will be visited by a Sanitary Inspector of the Board of Health, wearing a

badge of authority, or by police officers detailed for the purpose.

BE WISE IN TIME.

Prepare for the Cholera—How to do so —An Eminent Physician Calls Attention to a Perfect Germ Destroyer—His Experience.

The following account of a *perfect germ destroyer* was written by one of the most eminent physicians of our county, who kindly gives us the results of his practical experience in its use :

During the last year the attention of the medical profession was called to the *wonderful germicidal properties* of the *Bichloride of Mercury* or *Corrosive Sublimate.* Upon this it began to be extensively used as a surgical wash and for saturating surgical dressings, and experience has demonstrated its superiority in many respects to the old and reliable carbolic acid. *It possesses the power*

*** *San Jose Daily Mercury*, August, 1884.

of killing, in a very few minutes, the most virulent and active disease-bearing germs in the very attenuated solution of one part to 20,000, and can be used with safety for fresh wounds as strong as one part to 1,000. In these very weak solutions, its germicidal properties are greater than in much greater and more dangerous solutions of carbolic acid. It is, therefore, not only a more efficient, but a less dangerous and far cheaper antiseptic than carbolic acid.

ITS SUCCESS

As an antiseptic very naturally leads up to its introduction as a disinfectant, in which new capacity it is coming into note in the medical profession.

For whatever will destroy disease bearing germs in a wound and thereby promote its healing, will also kill these and other germs in cesspools, privies, etc., which, according to the views of the most advanced medical men, are the cause of most, if not all, contagious and miasmatic diseases. Hence, the ideal

antiseptic, "*ceteris paribus*," must be the ideal disinfectant. Or, in other words, the agent most destructive to disease-bearing germs, and at the same time safe to be used in the presence of the higher orders of animal life, will be the most efficacious in preventing disease and saving life.

In the *Bichloride of Mercury* such an agent has been discovered. It is inodorous, not volatile, and cannot be taken into the system through the inspired air, and will show poisonous effects only when swallowed, or used very carelessly on the skin, or injected into the blood.

It destroys foul smells, and is cheap in comparison to carbolic acid. It is undoubtedly the most *powerful practicable germicide known*. For use in privies, it possesses great advantages over carbolic acid and chloride of lime. The latter are volatile, and not only disagreeable and injurious to the air passages when used in efficient quantities in privies, but from their volatility pass very quickly into the atmosphere and lose strength

and disinfect only the *surface* of the foul mass; while

CORROSIVE SUBLIMATE

Is kept in solution by the chloride of sodium, or common salt, in the urine, and thereby slowly permeates the whole feculent mass, even to the very bottom of the privy vault, killing all of the germs on its way down, thus preventing any re-development of disease from germs remaining from one year to another.

The following is a good formula for making the disinfectant:

Bichloride of Mercury	1 part.
Chloride of Sodium or Common Salt	5 parts.
Pure Water, to make	100 parts.

This should not be made in metallic vessels, nor with metallic instruments, as the bi-chloride will corrode and destroy them, and to that extent injure its own powers. It can easily be dissolved in boiling water in a barrel with a wooden faucet, and drawn off in wooden or earthen vessels for use in privies.

Care should be taken that none of the solution is left about the house, as it is perfectly clear, but very poisonous, and might be taken by mistake for water by children or other persons.

Care should also be taken when using it for disinfecting not to wet the hands, as it hardens the skin and causes them to chap badly.

Its powers of corroding metals should be remembered when using it in privies or water closets furnished with metallic waste pipe, as such pipes would soon be damaged.