

important to recognize the fact, that it does not kill the bacilli; but it simply hinders their development. It does, however, stop putrefactive changes which would cause the death of these organisms. The use of this agent, therefore, is to be avoided in cases of cholera. Carbolic acid (one part to four hundred of the nutritive fluid), peppermint oil (one part to two thousand), sulphate of copper (one part to twenty-five hundred), quinine (one part to five thousand), corrosive sublimate (one part to one hundred thousand), possess the power of arresting the development of this microbe, and it is possible that they may absolutely cause its death. One very important point was brought out by these experiments, namely, that the comma bacilli die very easily when dried, and this may explain the fact, why epidemics of cholera disappear after a certain time. There is a very marked difference between the vitality of the specific germ of cholera, and that of small-pox. The former dies a natural death, while the latter may retain its vitality, when dried, for an indefinite period.

The arguments for and against the contagious nature of cholera are so many and so varied that more than a brief allusion to some of them would prolong this paper to an unreasonable extent. Dr. J. M. Cunningham, Health Commissioner of India, who has studied the disease where it is endemic, says emphatically that cholera is not contagious. He says, that from the record of about 8,000 attendants on cases of cholera in India, it is proved that they suffer no more than other people living in the same place. Surgeon-General Hunter, in his report on the epidemic of cholera in Egypt in 1884, expresses a decided opinion against its contagious nature. In the *Engineering Record* of September 10, 1892, the editorial writer says that patients ill with cholera can be attended, washed and lifted with very little risk, but that the discharges from the bowels are the chief, if not the only source of danger. Dr. Goodeve, who has had an extended experience with cholera in India, says that the disease does not spread from the sick to the well by any rapidly acting emanation. Lebert's views on this point are as follows, "That cholera can be spread only by contagion, that is, by germs which are carried from a diseased to a healthy person; but that these disease germs infect only comparatively rarely by intercourse or contact with cholera patients, since they possess relatively but little vitality in the air of the sick-room, and are present mostly in inconsiderable quantity. On the other hand, a certain number of the germs and a given vitality are necessary for the propagation of the disease, and these conditions are better met in fluids than in the air; hence contagion is more frequent when the germs are communicated through a fluid than when transmitted through the air."

From a study of the observations made in a recent epidemic in France, Dr. N. Mireur arrives at the following conclusions:

(1) "Cholera is not transmitted directly from the sick to the well either by contact or through the respiratory passages.

(2) "The products emanating from cholera patients, the dejections and vomited matters, contain a germ which is not immediately transmissible by itself, but which placed under favoring conditions, gives rise to a contagious principle.

(3) "Clothing and merchandise, much more than individuals, are the agents for the transportation of this principle."

From a careful study of the different authorities on this subject the general opinion seems to be:

(1) That cholera is mildly contagious.

(2) That the principal, if not the only, way of infection is by the alimentary canal.

(3) That the germs of the disease are carried only a short distance, if at all, through the air.

(4) That the great danger of infection lies in the intestinal discharges, and in the vomitus.

(5) That contamination of the water-supply, and of food, by these discharges is the chief source of danger.

(6) That linen or woollen fabrics soiled by cholera discharges, if excluded from air and sunlight, serve to keep alive the germs of the disease for an indefinite period.

The history of the *Swanton*, on which cholera did not appear until she had been at sea twenty-seven days, when clothing was unpacked by the passengers, and also the history of the ship *New York*, on which the disease did not manifest itself until she had been sixteen days at sea, prove the truth of the last statement. If the foregoing conclusions are correct, it necessarily follows that in order to prevent the admission of the disease to a city, and effectually to stamp it out, the following measures must be adopted:

(1) The proper isolation of all cases of the disease, mild and severe.

(2) The disinfection of all discharges, from the patient, by chloride of lime, or carbolic acid as recommended by the International Committee of Experts at Rome in 1885.

(3) The most careful supervision of the water-supply and of food.

(4) The rigid observance of all laws of hygiene in their widest sense.

(5) The disinfection of all persons in whom there is the slightest suspicion of infection by suitable bathing, and of their effects by super-heated steam.

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#### THE IMPORTANCE OF PUBLIC DISINFECTING STATIONS.<sup>1</sup>

BY S. W. ABBOTT, M.D.,

Secretary of the Massachusetts State Board of Health.

THERE is one point upon which I wish to say a few words — and the present emergency affords an excellent opportunity to enforce its importance with more than usual energy — and that is the need of a better sanitary equipment in all our large cities of this country for the carrying out of the principles of disinfection.

As at present conducted, in nearly all our large

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cities the Board of Health relies almost exclusively upon such disinfection as can be performed at the house where a case of infectious illness occurs, such disinfection being conducted either by an official of the Board of Health, or, as our statute prescribes, "by the householder in a manner approved by the Board of Health."

The object of disinfection is the destruction of infection, nothing more and nothing less, and thus to render harmless any poison which the sick person may have propagated in the house; and if even the least amount of the poisonous principle of the disease which has invaded that house is left in it undestroyed, just so far does danger still exist to all whom may occupy the house.

Now, I take it for granted, that no one, or at least very few at the present day, seriously doubts the infectiousness of cholera. The history of its spread to this country is a sufficient answer to any one who questions its portability by human beings, and their immediate personal effects and luggage. I have no doubt that we shall find in the present instance, as we have seen in the past, that the New York cases (I mean those which have occurred within the limits of the city) have had some connection, either direct or indirect, with the infected ships and their human freight in the harbor.

Now, as one of the foremost of the means of prevention in all infectious diseases (cholera not excepted) consists in disinfection, we should have in every large city at least one well-equipped disinfection station, with a corps of trained operatives, who should have the entire charge of the disinfection of houses and of all material which has been subject to infection. Such stations should be built of brick, stone, iron, or other impervious material. A prime point of great importance is the construction of a dividing wall to afford absolute separation of all infected from the disinfected material. In this wall the apparatus for disinfection should be located with an opening at each end. There should also be ample means for the washing and boiling of infected clothing, and for the destruction of infected material by fire.

I wish to call attention to the instructions published by the Health Office of the city of Berlin, for the management of the principal disinfection station of that city. This establishment, like the similar one recently built in Paris, has a dividing wall running through the building; and all things in it, horses, men, carriages, and utensils used in disinfection are distinctly separated. One set of men, etc., is employed to bring the infected material from the infected houses, and another set is employed to carry it home after disinfection.

Everything is done with the greatest attention to details and with very explicit instructions. In visiting two of these stations I was obliged to put on a rubber suit and disinfect my hands and hair before passing from one side of the building to the other. No communication is allowed between the two sets of officials.

If disinfection is done at all, it should be well done; and even after all has been done that human power can do in the way of prevention, some minute particle of infectious material may yet find its way from the sick to the well. As sanitary officials, however, we are bound to give to the community all the protection that modern progress in such matters can possibly afford.

Such stations would not only prove useful in case of the invasion of cholera, but very much more so in the case of those far more destructive diseases which are constantly present with us; I mean scarlet fever, diphtheria, and also in the case of typhus, if it should ever find a foothold among us.

For the disinfection of the excreta, which after all carries with it the greatest danger in cholera, nothing should be considered satisfactory but the most thorough disinfection, and this must be done at the house of the sick. But it is through the excreta that other articles are liable to become infected, such as the mattress, bed-linen, clothing of the patient, the carpets, etc., all of which should receive attention as well as the excreta, and their disinfection can best be accomplished at such stations as I have described.

## Clinical Department.

### TWO CASES OF ULCERATIVE ENDOCARDITIS, WITH AUTOPSIES.<sup>1</sup>

BY A. L. MASON, M.D., BOSTON.

CASE I. M. B., a chambermaid, eighteen years old, single, was admitted to the Boston City Hospital March 23, 1883. Her history threw little light upon her condition which was characterized by pain of rheumatic or neuralgic nature in the right thigh, for this she was treated with blisters and the subcutaneous injection of morphine. Physical examination and analysis of the urine gave no positive evidence. Her condition, though giving rise to an appearance of anxiety on the patient's part, presented no alarming symptoms whatever. The pulse was 92, temperature 98° F.

On the following day the left little finger at its distal end became swollen and painful, and in a few days required lancing. A little pus escaped. Four days after entrance there was a severe rigor followed by sweating. The temperature after the chill was 105.2° F. On the fifth day pain in the right wrist, without redness or swelling, ensued, and a papular eruption appeared on the face. Ten grains of salicylic acid were given every hour for one day; but this remedy was discontinued, as it did not appear to modify the articular pain. The temperature was 103.5°. Careful examination of the heart discovered nothing abnormal.

During the second week she complained greatly of general soreness and aching pain in the limbs. Diarrhœa ensued, with a moderately swollen and tympanitic abdomen. There were from three to six loose, dark dejections daily. Nose-bleed occurred several times. The conjunctivæ were congested, and petechial spots appeared on the abdomen. The tongue and throat became dry, and several small superficial white patches were noticed on the pharynx and uvula. There was no glandular enlargement. The continued febrile condition became marked, and stimulants were freely given, also sponge baths frequently. A grain of opium, with quarter of a grain of sulphate of copper, every six hours, partially controlled the pain and diarrhœa.

The symptoms, which at first might have pointed to a rheumatic origin, had now become rather "typhoidal," although the general appearance of the patient was not that of one suffering from typhoid fever. The face

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