RESTRICTION AND PREVENTION OF CONSUMPTION.

Sometimes called "Tuberculosis," "Phthisis," "Phthisis Pulmonalis," "Tubercular Phthisis," "Tubercular Consumption," or "Pulmonary Consumption."

LEAFLET ISSUED BY THE MICHIGAN STATE BOARD OF HEALTH.

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Consumption is the most common and fatal disease. In Michigan, it causes more deaths than any other disease. According to the Registration reports, issued by the Secretary of State (1893, p. 156), the average annual number of deaths from consumption in this State for the ten years, 1884-93, is 2,140, and from other tubercular diseases, 166; but it is believed that not more than two-thirds of the deaths are reported, so that the number of deaths which actually occur in Michigan from consumption is probably over three thousand per year. A large part of this mortality can be and ought to be prevented.

Consumption is now known to be a communicable disease, in which, frequently, the contagium is carried from the dried sputum of a consumptive to the lungs of a susceptible person, where it grows and multiplies and thus produces the disease. The germ which causes consumption is called the *Bacillus tuberculosis*, and it is present, in immense numbers, in the sputa of consumptives. These bacilli are from about one twenty-thousandth to about one ten-thousandth of an inch in length, and their breadth is about one-sixth of their length. (From 1.5 to 3.5, by .4 micro-millimeters.) These bacilli have been thoroughly studied, and by inoculations with them the disease has repeatedly been caused in lower animals. Interesting experiments have been made in this connection by Dr. George Cornet, of the Berlin Hygienic Institute, with the dust of rooms inhabited by consumptives. Dust, collected from those surfaces not likely to be contaminated directly by the spitting or coughing of the patient, was mixed with sterilized bouillon and injected into the peritoneal cavity of guinea pigs. Forty days later the animals were killed, and a careful necropsy was made. Twenty-one hospital wards, in which there were consumptive patients were examined in this way, and from the dust of fifteen of them, tuberculosis was set up in the guinea pigs experimented upon. Private houses where consumptives lived gave similar results; where patients had been in the habit of expectorating on the floor, the dust from the walls was certain to yield infectious cultures, but where cloths or spittoons had been used this was not the case.

The mode of communication of this disease is mainly from the dried sputa from consumptives. The germs in the sputa are carried into the air by sweepings, and deposited upon walls or contents of rooms, and find their way to the lungs of persons.

Destruction of the sputa.—It is evident that the most certain preventive of consumption is to destroy the sputum from the consumptive before it has an opportunity to dry and scatter the seeds. It is for the consumptive's own safety to destroy the sputa, because it reduces to a minimum the possibility of re-infection. Any person who has an habitual cough, and raises sputa, should have a microscopical examination* of the sputa, to ascertain whether they contain the *Bacillus tuberculosis*. Without waiting for such examination, in all such cases the sputa should be disinfected.

How the sputa should be destroyed.—No consumptive should expectorate on the floor. Cuspidors, in hotels and other public places and in rooms occupied by consumptives, should be partly filled with water.

* For the convenience of physicians in the diagnosis of tuberculosis arrangement has been made with the State Laboratory of Hygiene, at Ann Arbor, Michigan, to make bacteriological examination of the sputa in suspected cases, at a small expense to the physician or person. Persons wishing such an examination made at the State Laboratory, should correspond with Dr. Vaughan, the Director of the Laboratory, before sending the sputa.

They should be washed twice each day in boiling water, and the contents should be disinfected with a solution of bichloride of mercury. The cuspidor might well contain constantly a disinfectant, such as a five per cent solution of carbolic acid,—one ounce of carbolic acid dissolved in a pint and a half of water.

The consumptive should carry small pieces of cloth (each just large enough to properly receive one sputum) and paraffined-paper envelopes or wrappers in which the cloth, as soon as once used, may be put and securely enclosed, and, with its envelope, burned on the first opportunity.

Isolation of the patient.—If a consumptive is ignorant, insane or wilful, and will not use the proper measures for preventing the spread of the disease, the question of isolation, as in such cases is required by section one of act 137, laws of 1883, should then be considered, by the health officer and local board of health.

Destruction of the dejecta.—All dejecta of a consumptive person should be destroyed or disinfected; because it has been shown that the bacilli are to be found in the urine of persons having tubercular disease of the urinary organs, and in the fæces of those having tubercular disease of the bowels, and they may be in the fæces of those who swallow sputa containing the bacilli, that is, possibly, of any consumptive. Disinfect each discharge from the bowels by thoroughly mixing with it at least one ounce of chlorinated lime in powder, or one quart of "Standard Solution No. 1," recommended by the American Public Health Association's Committee.*

Ventilation of buildings.—Through better systems of ventilation, much may be done for lessening the number of micro-organisms inhaled with the dust of floors, carpets, etc., especially by having the foul-air exits at the floor level, so that the general motion of the foul air shall be downwards, and not upwards into the nostrils of the inmates of the room. This is especially important with reference to all public buildings, as, also, that they shall constantly have a liberal supply of fresh air.

Personal precautions.—Those who sweep and dust rooms which consumptives have occupied might well use respirators. Much may be done to lessen the liability to contract consumption by having the sanitary surroundings as nearly perfect as possible, and by keeping the lungs strong and healthy. It is stated that "in no less than sixty per cent of all patients dying at Bellevue hospital there were old tubercular changes in the lungs, the disease having been recovered from." Similar observations have been made at the Philadelphia hospital, and at the Paris morgue. Dr. Trudeau's experiments prove that rabbits inoculated with the *Bacillus tuberculosis* and kept in a cellar-like place, on restricted diet, died of the disease in much greater proportion than did similar animals similarly inoculated but kept in the open air with an abundance of food. These facts emphasize the importance of pure food, pure air, and healthful exercise.

Exposure to cold should be avoided.—Statistics of sickness and of deaths, collated with meteorological statistics, seem to prove that the consumptive processes go on most actively after times of low atmospheric temperature, and least actively after times of high atmospheric temperature. This makes it important that consumptives, and persons susceptible to consumption, should especially guard against the inhalation of cold air. It enforces the importance of having such persons spend the winter and spring months in a climate warmer than that to which they have been accustomed.

* "Standard Solution No. 1" is made by adding to each gallon of soft water four ounces of chloride of lime of the best quality, which should contain at least 25 per cent of available chlorine. "Use one quart of this solution for the disinfection of each discharge in cholera, typhoid fever, etc. Mix well and leave in vessel for at least one hour before throwing into privy-vault or water-closet."

Disinfection.—The dusting of objects in the room, the cleansing of the floor, walls, or ceiling of the living or sleeping room of a person suffering from pulmonary consumption should be deferred until after the room and contents have been subjected to the fumes of burning sulphur, or of formaldehyde. Curtains, draperies, carpets, clothing, and all movable articles should be **exposed to sunlight in the open air.** The unwashed clothing of a consumptive should not be mingled with the unwashed clothing of another person; care should be taken that the handkerchiefs be boiled, that other articles liable to harbor the bacillus be disinfected, and that no virus come in contact with a cut or injured hand.

No one should sleep in the same room with a consumptive patient, nor in a room which has been occupied by a consumptive, unless the room (with all its contents) has been previously thoroughly disinfected, first subjecting it, for twenty-four hours, to strong fumes of burning sulphur, or of formaldehyde, and then it should for several hours be exposed to currents of fresh air. But neither of these agents should be relied upon exclusively. After fumigation, the walls should be whitewashed, alabastined, painted, repapered, or rubbed with bread crumbs which should then be burned; the woodwork, including the floor, should be painted or thoroughly washed; and, if any sputum is deposited thereon, it should be washed with a solution of bichloride of mercury, one part to five hundred parts of water.

Rooms subjected to sulphurous fumes or to formaldehyde must be vacated. For a room ten feet square at least three pounds of sulphur should be burned, or at least eight fluid ounces of formalin containing 40 per cent formaldehyde, should be rapidly distilled into the room; and for larger rooms proportionately increased quantities should be used, at the rate of at least three pounds of sulphur or at least eight fluid ounces of formalin per each 1,000 cubic feet of air space.

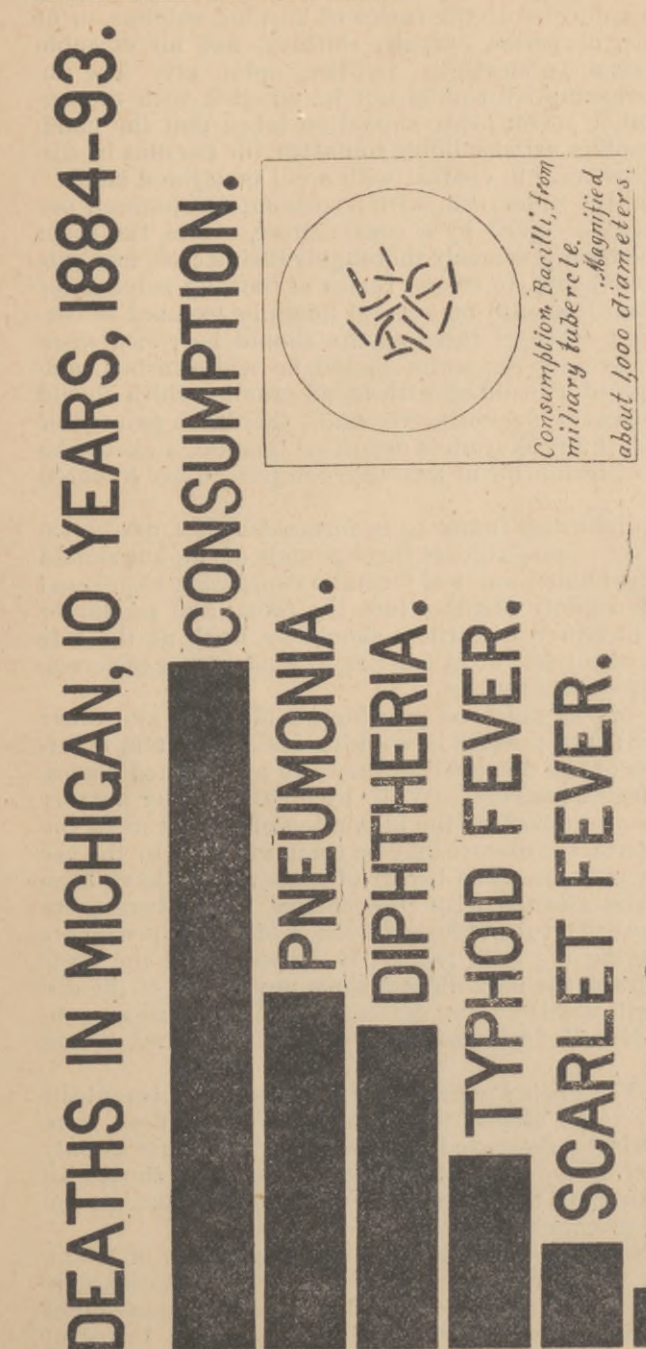
Hang up and spread out as much as possible all blankets and other articles to be disinfected; turn pockets in clothing inside out, and otherwise facilitate the access of the disinfecting fumes to all infected places.

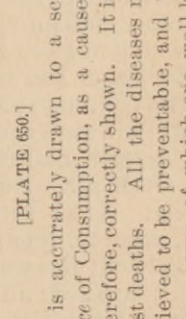
Boil milk from suspected sources.—While by far the greater number of cases of consumption are caused by the inhalation of the germs of the disease from the dried sputa, the disease may be communicated by the use of milk from tubercular animals. The bacilli of consumption have been found in the milk of cows affected with tuberculosis, even where there was no evidence of localized tuberculosis of the udder. Experiments indicate that, while heating the milk to 167° F. so weakened the virus that six rabbits which drank the milk did not show any traces of the disease, boiling the milk will destroy these germs. These experiments render it important that all milk from suspected sources be boiled before being used.

Tuberculous meat.—The Paris Congress, for the study of tuberculosis in man and in animals, voted almost unanimously that the flesh from tubercular animals should be destroyed, even where the disease is only localized, if a large part of the organ is affected. Not only should all meat from tubercular animals be destroyed, but all meat from an unknown source should be thoroughly cooked.

Collection of information.—Householders and physicians in Michigan are required by law to report every case of well-developed consumption of the lungs to the local health officer. Health officers and physicians are requested to continue to send to the office of the State Board of Health, at Lansing, information concerning cases under their observation where consumption appears to have been communicated, directly or indi-

rectly, from one person to another, the relation between the individuals, the presence of family predisposition, if any, and other interesting facts in connection with such cases.





Consumption Bacilli, from miliary tubercle. Magnified about 1,000 diameters.

[PLATE 650.]

This diagram is accurately drawn to a scale, and the *relative importance* of Consumption, as a cause of deaths in Michigan, is, therefore, correctly shown. It is the disease which causes most deaths. All the diseases mentioned on this page are believed to be preventable, and to be caused by micro-organisms, some of which are well known; those which cause consumption are represented in the circular space above.

CONSUMPTION IS A DISEASE DANGEROUS TO THE PUBLIC HEALTH.

IT SHOULD BE REPORTED TO THE HEALTH AUTHORITIES.

SUBSTANCE OF RESOLUTION ADOPTED BY THE MICHIGAN STATE BOARD OF HEALTH.

[224—9th Ed.]

Hereafter, consumption shall be included in the official list of "Diseases dangerous to the public health," referred to in sections 1675 and 1676 Howell's statutes, requiring notice by householders and physicians to the local health officer, as soon as such disease is recognized.

[In this resolution the question of isolation of the patient is not mentioned. Its purpose is to secure to the local health authorities and to the State Board of Health, information of the location of each case of this most dangerous disease,—commonly known as "Consumption of the lungs," with the view of placing in the hands of the patient, reliable information how to avoid reinfecting himself or herself, or giving the disease to others, and in the hands of those most endangered, information how to avoid contracting this disease.

HENRY B. BAKER, Secretary.]

THE PREVENTION OF CONSUMPTION.

Instructions to Consumptives and their Friends.

Consumption is the most destructive disease, the number of persons dying annually from this cause in Michigan amounting to about three thousand.

Consumption is a dangerous communicable disease, the most dangerous one in Michigan. One consumptive may spread the disease to very many healthy persons. The chief danger exists in the expectoration of the consumptive person, and if this expectoration is carefully destroyed before it is dried, little danger need be feared.

Consumptives should be instructed not to spit upon sidewalks, the floors of rooms, public halls, street and railway cars, and other vehicles, nor where fowls or dairy cows may take in the sputum, or the dust of it with their food. They should spit into pieces of cloth, or receptacles made for the purpose, containing a saturated solution of carbolic acid (one part of carbolic acid crystals to about fifteen parts of water). Such pieces of cloth should be destroyed by fire, before the sputa become dry, and other receptacles should be cleansed with scalding water, their contents having been destroyed or otherwise carefully disposed of. Handkerchiefs which may have been used from necessity should be boiled half an hour before washing.

It is best that all persons who have a cough should carry small pieces of cloth (each just large enough to properly receive one sputum) and paraffined paper envelopes or wrappers in which the cloth, as soon as once used, may be put and securely enclosed, and, with its envelope, burned on the first opportunity.

Remember that sputa must never be allowed to become dry.

OFFICE OF THE SECRETARY OF THE STATE BOARD OF HEALTH,
Lansing, Michigan, August, 1889.