Restriction of Tuberculosis.

Read in the Section on State Medicine, at the Forty-fifth Annual Meeting of the American Medical Association held at San Francisco, June 5–8, 1894.

BY J. H. DAVISSON, M.D.

MEMBER OF CALIFORNIA STATE BOARD OF HEALTH; MEMBER AMERICAN PUBLIC HEALTH ASSOCIATION, ETC.

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RESTRICTION OF TUBERCULOSIS.

Tuberculosis is the great enemy of the human race, —one-seventh of the entire human family die of tuberculosis.—(Koch). But little progress had been made in prophylaxis or treatment until the discovery by Koch of the pathogenic germ, the bacillus tuberculosis, which he announced to the world in 1882.

The bacillus tuberculosis is "parasitic, aerobic, non-motile, and only grows at 37 degrees C."—(Sternberg); though certain bacteriologists of the French school say it thrives even better at 39 degrees C. The thermal death point of the bacillus tuberculosis is about 70 degrees C.—moist heat—but it was formerly believed to be much higher, even 100 degrees C. The unstained spaces in the preparations of the bacilli under the microscope are generally believed to be spores, but the question of sporulation remains unsettled as the non-resistance of the bacillus to chemical agents, and having such a low thermal death point, would not indicate the existence of spores.

The bacillus being strictly a parasite does not grow or propagate outside of animal bodies, though certain animals, indeed a large number of the mammalia are immune. The human species, bovines and monkeys are more susceptible to the action of the bacillus tuberculosis than other animals. The period of viability or potential period of the bacillus tuberculosis, as it is found in dried sputum in residences, public buildings, and thoroughfares, where hidden from the sunlight, is about three months. De Toma and others have found it potential after nine or ten months.

It is needless to say that it is now definitely settled

that every case of tuberculosis in man or other animal, like every case of typhoid fever or Asiatic cholera, is due solely to its own pathogenic germ, and derived from a previous case. No one now believes in heterogenesis, as every circumstance connected with origin, development and progress of tuberculosis goes to prove the correctness of pathogenesis, as in typhoid fever, Asiatic cholera, and other infectious and contagious diseases. Dr. Flick's analysis of the mortality of the Fifth Ward in Philadelphia constitutes a most striking example of the infectiousness of tuberculosis.

Tuberculosis has always been regarded an hereditary disease, but since the discovery of the specific bacillus we have learned that tuberculosis is not inherited but is due to infection. That peculiar condition of the organism which lacks immunity to tuberculosis and renders one susceptible is inherited. While the greater number of individuals are born immune, many conditions of ill health and traumatism lower vitality, and render many others susceptible to tubercular infection by destroying native or innate immunity.

Human tuberculosis of every form then is directly due to inhalation, ingestion or inoculation of bacilli derived from mammals, either taken in with the air we breathe, or with food or drink, or by kissing, or by handling infected articles, as money, toilet articles, furniture, etc., or being otherwise inoculated wiih tubercular bacilli. Probably the larger proportion of cases of tuberculosis originate from the inhalation of the bacilli in desiccated and pulverized sputum which floats in the air as impalpable dust, in apartments and in the open air, producing pulmonary phthisis generally.

Next in order of frequency comes the immense number of cases of the numerous forms of tuberculosis from ingestion of infected food and drink—especially milk. Among this class are to be found most of the tubercular infants and children with

tubercular meningitis, tuberculosis of glands, joints, bones, etc., the direct result of infected milk.

The third class, and probably the smallest number, in the light of existing knowledge on the subject, includes all cases otherwise infected or inoculated.

Many people look upon the restriction of tuberculosis by legal methods as tyranny and not consonant with our highest civilization; but this first thought or impression is soon dispelled by an understanding of the *rationâle* of infection and correct methods of sanitation and its results. The restriction of tuberculosis by offensive legislative enactments being placed upon the subjects of this chronic, infectious, and eventually fatal malady is erroneous. Certain reasonable legal restrictions should be placed upon tubercular patients, but principally upon others with whom they have to do. A strict quarantine should not be placed upon intelligent, rational and cleanly patients who willingly conform to the demands of sanitation which offers the surest means of preventing auto-infection, and security to the family and the country at large. It is a mistake to think that society is not ready for restriction. Society has long since been educated up to the point of absolute quarantine against all other infectious diseases, as smallpox, cholera, yellow fever, etc., diseases comparatively less fatal and by far less frequent—indeed society clamors for restriction of all such preventable diseases; but the legal restriction of a disease as surely preventable, so universal and so fatal, confronts the sanitarian with many difficulties, chiefly imaginary, that thorough education of the masses by official bulletins and other literature, by boards of health, can remove in a little time. Legal restrictions should be placed upon hotels, lodging houses, dwellings, public buildings and public thoroughfares, as railway coaches, sleepers, steamships, sailing vessels, omnibuses and other public conveyances. All such apartments and common carriers should be so furnished that under rigid sanitary rules they

should be thoroughly disinfected immediately after occupancy by tubercular patients. Tuberculosis is not infectious until it is apparent—as during the third stage of pulmonary tuberculosis, or when breaking down and ulcerating and discharging, in affections of the glands or bones—and is not communicated by the breath of patients. Notification, registration and disinfection after death, removal, or recovery, should not be deemed hardships in the face of so much danger, even to members of the household.

If patients in the third stage of pulmonary tuberculosis will persist in traveling, it should be unlawful to infect highways,public buildings and thoroughfares, etc., by spitting broadcast, as is usually done, but such patients should be provided with suitable sanitary cuspidors, or they should be supplied with handkerchiefs of cheap and suitable material, to be used but once and then rolled up and burned at the first opportunity. The roving of such patients in the vain hope of regaining their health—often by the advice of a physician, but generally at the suggestion of some would-be friend who knows absolutely nothing of the case and generally less of the country or climate to which he presumes to direct the sufferer, is to be condemned as dangerous to public health, and bad treatment for the patient. Many of these unfortunates, in the third stage of consumption, and beyond all hope of recovery, roam the country over, planting germs of disease and death in their tracks, and subjecting themselves to all manner of hardships and unscientific treatment at the hands of unscrupulous advertising charlatans, to die away from home and among strangers. Keep such patients at home for their own sakes and keep them at home for the sake of others.

The segregation of tubercular patients in hospitals, both private and public, is to be encouraged. While it is true that with perfect sanitation tubercular patients do not spread infection, even though they are

intimately associated with others, yet segregation in hospitals, hotels, restaurants, lodging houses, asylums, prisons, dwellings, and in common carriers, is necessary until the masses are thoroughly schooled in the technique of sanitation.

"A person suffering from tuberculosis can be made entirely harmless to those about him by thorough sterilization of all broken down tissue immediately upon its being given off. With proper precautions it is therefore possible to live in the closest relation and upon the most intimate terms with consumptives without contracting the disease."—(Report of Committee American Public Health Association, 1893.)

I am in full accord with Dr. Baker, the efficient Secretary of the Michigan State Board of Health, in the idea that no State charity can accomplish more good results to mankind than a State hospital for the care, treatment and prevention of tuberculosis. By it the indigent consumptive can be infinitely better cared for and at less expense than now done, and all classes of society protected from this prolific source of infection. Private hospitals for the care and treatment of cases among the well-to-do, rather than sending them to the numerous health and pleasure resorts, would give much better results, as far as the patient is concerned, and restriction would be accomplished without objectionable features. Such institutions would have every facility for treatment and the perfect sanitation of such places would lessen auto-infection, so common among tubercular patients. These sanitaria should be located in climates and localities adapted to the purpose, and in the country in mountainous regions and at altitudes of about 2,000 feet, since the best results have been attained in climatic treatment by Loomis, America's greatest climatologist, at 1,800 to 2,000 feet in this country.

The question of altitude, in the treatment of tubercular consumption is in great part determined by locality or country and peculiarities of topography,

meteorological conditions and climate. Tranquillity of the nervous centers, with consequent refreshing sleep, together with absence of cardiac disturbances and lessened tendency to hemorrhages, commend the relatively lower altitudes in California and many other climates in this country. Barring the disturbances of the nervous and circulatory systems, the higher altitudes of the Rocky Mountains, so ably set forth by Dr. Denison, of Denver, in many articles and reports, form notable exceptions to this rule While in Europe many of the best climatologists regard altitudes below 4,000 feet as only preparatory to higher altitudes—as does Dr. Denison—and secure the best results at from 4,000 to 6,000 feet, or more.

In corroboration allow me to quote from Dr. S. Jaccoud's original article in the *Medical Week*, March 9, 1894, as follows: "Undoubtedly by reason of its location both toward the north and east, the climatic conditions of Görbersdorf, Brehmer's admirable creation in Silesia, in spite of its low elevation (1,827 feet), are closely analogous to the conditions prevailing in Switzerland at a height of 4,200 to 4,600 feet, and the tonic action is in every respect similar."

The dairy is now known to be one of the prolific sources of tubercular infection and Dr. Salmon, Chief of the Bureau of Animal Industry, states that about 3 per cent. of dairy cows near our large cities are tubercular. In a report to the Provincial Board of Health, Toronto, Dr. Brice, the Secretary, says that 4.5 per cent. of cattle slaughtered in Berlin were tubercular; 9.5 per cent. of those in Upper Silesia; and 12.22 per cent. of 12,000 cattle killed in England under the Pleuro-Pneumonia Act of October, 1890, as determined post-mortem.—(JOURNAL AMERICAN MEDICAL ASSOCIATION, May 12, 1894.)

That milk is often filled with tubercular bacilli, with no apparent disease of the udder, is the dictum of many authorities, hence we should have thorough inspection of cattle and dairy cows by competent veterinarians, and in addition to the usual methods

of investigation the use of tuberculin as a diagnostic agent is now indispensable.

Dr. Legay stated to the Congress de la Tuberculose that he had added desiccated and powdered tubercular sputum to milk which he then boiled and then injected into rabbits and produced tuberculosis.—(*National Popular Review*). This teaches another lesson in the important process of sterilization of this most important food product.

The Committee on Restriction and Prevention of Tuberculosis, of the American Public Health Association at Chicago, in October, recommended the following resolutions relating to restriction, which were adopted, viz:

"1. The notification and registration by health authorities of all cases of tuberculosis which have arrived at the infectious stage.

"2. The thorough disinfection of all houses in which tuberculosis has occurred, and the recording of such action in an open record.

"3. The establishment of special hospitals for the prevention of tuberculosis.

"4. The organization of societies for the prevention of tuberculosis.

"5. Government inspection of dairies and slaughter houses, and the extermination of tuberculosis among dairy cattle.

"6. Appropriate legislation against spitting into places where the sputum is liable to infect others, and against the sale or donation of objects which have been in use by consumptives, unless they have been thoroughly disinfected.

"7. Compulsory disinfection of hotel rooms, sleeping-car berths and steamer cabins which have been occupied by consumptives, before other persons are allowed to occupy them."

A practical means of limitation of tuberculosis or prophylaxis is thorough drill of the patient, friends and attendants by the physician in charge, and ample rules of technique and literature relating to the disease should be furnished gratis to physicians and nurses by boards of health. The plan of the New York Board of Health, of making bacteriologic examinations gratis for medical attendants, in suspected

cases, should not only be generally adopted, but should include other infectious diseases as well.

When we contemplate an annual death rate of 163,500 in the United States from the various forms of tuberculosis, without efficient restrictive measures, we should take courage at reading the following extract from an editorial in our official JOURNAL: "The indisputable fact that its death rate (meaning tuberculosis) has been reduced to one-fifth of its former proportions by rigid enforcement of simple and practicable measures of disinfection, of excretions and discharges of every tubercular patient, and of every material thing liable to be contaminated by such excretions and discharges, is a rift in the cloud through which may be discerned the time when tuberculosis like leprosy and the black death, shall, be of interest merely to the historian of human progress," —(Rohé).

In a recent presidential address before the Medical and Chirurgical Faculty of Maryland, Dr. Rohé says: "The isolation of patients is unnecessary; when the material containing the tubercle bacilli—in these cases the sputa—is destroyed, the consumptive is no longer dangerous to his most intimate associates." Such positive statements by these and many other most competent sanitarians should inspire the consumptive and his friends to the strictest sanitation as a means of self-defense.

Restriction of tuberculosis is not only justified from the standpoint of sociology but it is also justified from a business standpoint. When tuberculosis is viewed in the light of financial losses to the country and the nation, the logic of results of restriction demonstrates the correctness of restriction as a business proposition. It is rather difficult to understand why no material advancement in prophylaxis has been made, as the contagiousness of tuberculosis has had its believers for centuries. It is also a matter of wonder that after the thorough restrictive decrees of the King of Naples more than a cen-

tury ago, which seemed to be based upon correct views of infection, and so effectual—though in some respects overdone—that the medical world did not take up the cue and that the dictum of the Neapolitan Kingdom did not mark an important era in the prevention of tuberculosis; to be rapidly followed with more general restriction.

As announced in a circular letter in November, Dr. J. R. Laine, Secretary of the California State Board of Health, at the second annual State Sanitary Convention, held at San Jose, April 16, 1894, (under the auspices of the State Board), offered the following resolution, which was adopted:

"*Resolved*, That hereafter consumption (and other diseases due to the bacillus tuberculosis) should be included in the list of diseases dangerous to public health, requiring notice by householders and physicians to the local health officer as soon as such disease is recognized."

Advanced grounds are now being taken in the prevention of tuberculosis in many countries in Europe, and in our own country by various State Boards of Health, and by many cities and towns.

In conclusion, permit me to say that the difficulties of restriction of tuberculosis are in fact chiefly imaginary and pessimistic and will soon give place to reason and thorough sanitation.