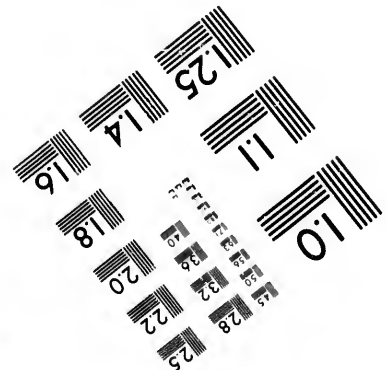
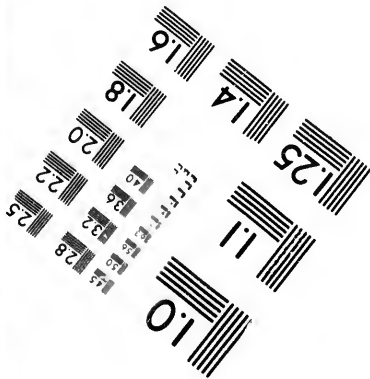
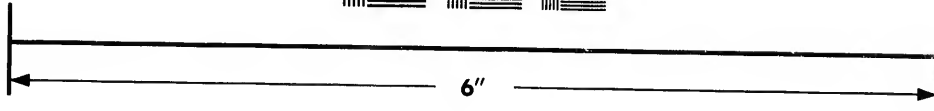
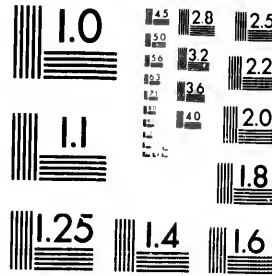


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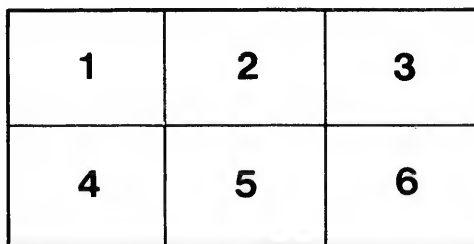
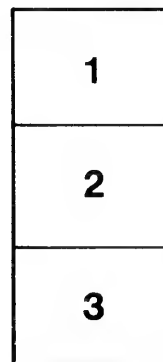
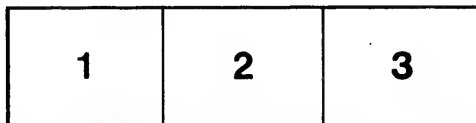
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THE
CONGRESS ON TUBERCULOSIS

HELD IN

BERLIN, GERMANY, ON MAY 24th, 25th AND 26th, 1899

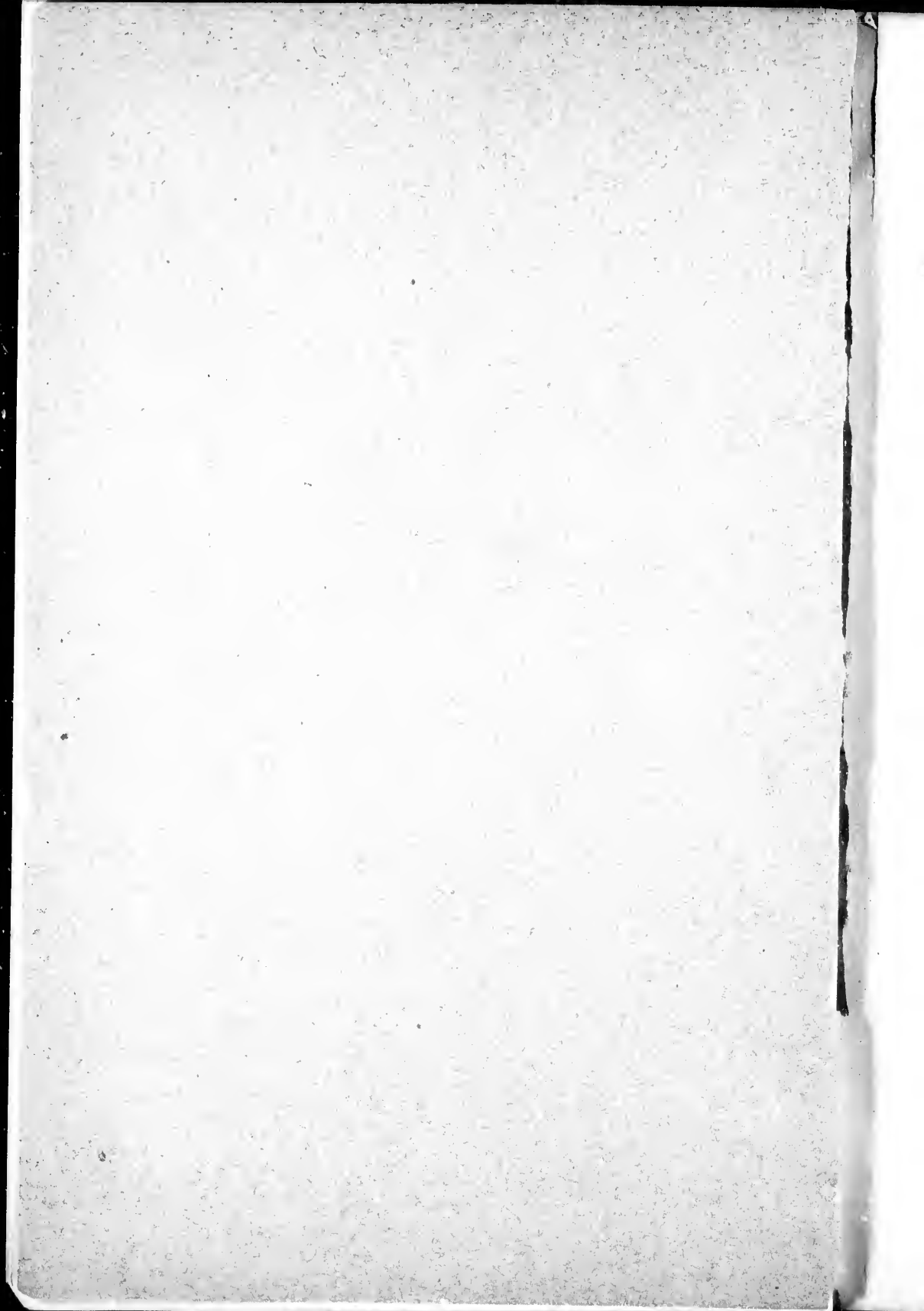
REPORT OF THE PROCEEDINGS

BY

EDWARD FARRELL, M.D., OF HALIFAX, N.S.

The Canadian Delegate to the Congress

OTTAWA
GOVERNMENT PRINTING BUREAU
1899



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REPORT OF THE PROCEEDINGS
OF THE
CONGRESS ON TUBERCULOSIS

Held in Berlin, Germany, on May 24th, 25th and 26th, 1899.

To the Hon. SYDNEY FISHER,
Minister of Agriculture.

SIR,—In accordance with your instructions, I proceeded to Berlin, and attended the Congress on Tuberculosis, held in that city, in May.

The congress was attended by delegates from most of the countries of Europe, Germany being most largely represented by many of her most distinguished authorities in medical science. The United States, Persia and Japan also sent delegates. From the British Empire came the Right Hon. Sir Herbert Maxwell and Dr. Pye Smith to represent the British Government. The National Society for the Prevention of Tuberculosis in Great Britain sent Prof. Sir Thomas Granger Stewart, of Edinburgh, Mr. Malcolm Morris and Dr. Hillier, of London. There were also delegations from Australia, New Zealand and Canada.

The gathering was considered one of national importance in Germany. The meetings were held in the Council Chamber of the Reichstag. Her Majesty the Empress graciously consented to open the first meeting. Among the many kind attentions to the delegates were brilliant social entertainments given by the Kaiser, the Chancellor of the Empire (Prince Hohenlohe), the Burgomaster of Berlin and others.

The whole subject was considered under four heads:

- 1st. Dissemination of tuberculosis.
- 2nd. Its causes.
- 3rd. Prevention.
- 4th. Treatment and sanatoria.

Dr. Kohleh, the Director of the Imperial Health Office in Berlin, introduced the first subject. He gave statistics of the prevalence of the disease and its mortality. His tables showed that England, Belgium, Sweden, Norway and Italy had the smallest mortality from consumption, and Russia and Austria the highest. Of the cities, London, Naples and Buenos Ayres gave the lowest mortality, and Vienna, Buda-Pesth, Moscow and St. Petersburg the highest. He also mentioned the greater prevalence of the disease in cities and large towns than in the country districts.

Dr. Krieger dealt with the subject of occupation as a cause of the spread of tuberculosis. He mentioned particularly those who have the care and nursing of consumptives; persons who lead sedentary lives, those whose occupation leads to the inhalation of irritating dust, creating points of local irritation and lessened resisting power in the bronchial tubes, as being particularly liable to take the disease.

Dr. Schjerning, Chief Medical Officer of the German War Office, presented statistics of tuberculosis in the German Army. His analysis showed that the disease rate from tuberculosis was higher among those soldiers recruited from the cities and large towns. In the garrisons also in large centres, especially among men employed indoors, the rate was higher.

Prof. Bollinger, of Munich, spoke of the relation between tuberculosis in domestic animals and in the human subject. The identity of the disease in cattle and hogs and human tuberculosis was shown. The tubercle bacillus was the cause in all instances. Animal tuberculosis was a great source of danger to man. The danger from meat was not great unless it was taken uncooked. Milk and its products from infected cattle were most to be dreaded. The frequency of tuberculosis in hogs, mostly due to feeding on infected milk, was cited as a proof of this danger. In children especially, infected milk was largely the cause of the so-called scrofulous affections.

In the discussion which followed the reading of these papers, Dr. Schmid, of Berne, Director of the Swiss Health Office, Dr. Brauer, of Heidelberg, Dr. Kuthy, Buda-Pesth, and Dr. George Meyer, Berlin, took part. The points to be particularly noted were the large mortality from tuberculosis among tobacco workers, due to crowded factories and dust-laden air, and the prevalence of the disease among the employees of the printing offices in Berlin.

SECTION II.—ETIOLOGY.

Under this head the papers were, to a great extent, scientific in character; and the names of Flügge, Fränkel, Pfeiffer, Loeffler, Lannelongue and Courmont were sufficient guarantee that the bacteriological elements of the subject were crystallized into an instructive form.

Professor Flügge, of Breslau, gave us a history of the study of the causes of tuberculosis, leading up to the now well known fact which will no longer admit of discussion, that *the tubercle bacillus is the direct cause of all varieties of consumption in the human subject and also of bovine tuberculosis*. Tubercle bacilli were parasites which flourished in living animal tissue, but quickly lost virulence outside the animal organism.

Professor Fränkel, of Halle, presented the same view as the previous speaker in regard to the tubercle bacillus being the only direct cause of the disease. From it came all the infection. In the pus of the tuberculous sore, in the sputum from the diseased lung; in meat and milk, if infected, it was the tubercle bacillus which conveyed the disease. Every human being infected with tuberculosis and every infected animal were centres from which the disease spread. In spite, however, of the number of sources of their origin and the immense production of tubercle bacilli, they are found principally in the surroundings of the consumptive patient, where the production is enormous; if the patient is removed, infection, to a great extent, ceases, for the bacilli have but little vitality outside the organism. Direct sunlight, putrefaction, and desiccation soon destroy them.

Professor Pfeiffer, of Berlin, gave an interesting account of the later stages of lung consumption, pointing out that the severe symptoms of the suppurative stage were due to pus-producing organisms, making a second infection in addition to the tuberculous sore. These cases of mixed infection were no longer cases of uncomplicated tuberculosis.

Professor Loeffler, of Greifswald, considered the question of heredity and immunity. We have yet no means of producing immunity. Hereditary tuberculosis is very rare; it may occur through infection from the genitals of the mother. A tuberculous father does not transmit the disease.

Dr. Max Wolff, of Berlin, described his experiments to determine the heredity of tuberculosis. The result of his experiments showed that but one out of sixty infected animals transmitted the disease to its offspring.

SECTION III.—THE PREVENTION OF TUBERCULOSIS.

Dr. Roth, of Potsdam, read a paper on the general means to be taken for the prevention of consumption. He claimed that as the disease is infectious, public health boards should deal with it as such, and provide the means of prevention. The expectorated matter was the great danger. The sputum of the tuberculous patient must be destroyed. The people should be instructed in regard to this danger. We must also learn to recognize consumption in its early stages. He strongly advised the use of spittoons made of paper, which could be burnt every day.

Professor Heubner, of Berlin, spoke on the important subject of the prevention of tuberculosis in children. The disease was acquired in the young by breathing the germ. Care should be taken to keep children apart from members of the family or others suffering from consumption, as the children of tuberculous parents are more easily infected than others. Such parents should be taught, not only the importance of avoiding infection in their children, but that they should be fed well, live an out-door life and have all means taken to strengthen their tissues and make them resistant of the disease.

Professor Kirchner referred to the marriage of tuberculous persons. Infection of husband or wife and children was the result of such marriages. When such marriages took place, persons should be instructed as to the danger which existed. If the public understood the danger, such marriages would be, to a great extent, avoided.

Professor Rubner discussed the subject of the prevention of tuberculosis in factories and dwellings for the crowded poor. He spoke of house inspection, the necessity which exists for better sanitary arrangements in factories, so that overcrowding, imperfect ventilation and a dust-laden atmosphere would be avoided. Notices should be posted in all public conveyances cautioning travellers not to spit on the floor. Sleepings cars should be well ventilated and cleaned every day when in use.

Professor von Leube, of Würzburg, dealt with the subject of prevention in hospitals. The most strict cleanliness was necessary. Tuberculous patients should have a special receptacle for the sputum, and during the act of coughing should hold a pad of absorbent cotton over the mouth, which should be immediately burnt. Veils should be worn by those making the beds or dusting. When proper attention was given to preventive measures, tuberculous patients need not be isolated, but, whenever possible, it is better and safer to separate tuberculous from other patients in general hospitals. The importance of specially constructed hospitals or wards for "open air treatment" was dwelt on.

Professor Virchow spoke of the prevention of tuberculosis from articles of food. Cattle, by their meat and milk, hogs and, to some extent, poultry spread the disease. The tuberculosis test should be employed to discover its existence. He impressed us with the danger of tuberculous milk. Milk as it comes from the gland of the cow may be infected, but it certainly is when tuberculous sores exist on the udder of the cow. Milk must be sterilized. Hogs were more subject to tuberculosis than was generally believed, usually in the form of tuberculous glands in the neck.

The disease in poultry was not identical with human tuberculosis, but yet he considered it a source of danger.

Dr. Von Maar read a paper on stable-hygiene in relation to tuberculosis in cattle. He pointed out that the disease in animals was perpetuated by housing them in dark, dirty and ill-ventilated barns, and he urged the necessity of instructing farmers and animal breeders on the importance of having buildings for their cattle light, airy, well-ventilated and scrupulously clean. Strict cleanliness in handling milch-cows is an absolute necessity. This instruction should be given by public lectures or by literature on the subject furnished by the agricultural authorities.

SECTION IV.—THE TREATMENT OF THE DISEASE.

In this section papers were read by Curschmann, of Leipzig, Kobert, of Rostock, Brieger, of Berlin, Sir Hermann Weber, of England and Dettweiler, of Falkenstein, one of the pioneers of the "open air" treatment. The reading of the papers in this section was followed by an interesting discussion. The principal facts brought out were the following:—Much better results of treatment are obtained now since disinfection and "open air" treatment are used. A cure is possible and a considerable prolongation of life likely to result if the modern system of treatment is properly carried out. Recovery can only be brought about *when the disease is attacked in its early stage*. In the later stages treatment with the hope of cure is useless. Climate is not considered so important as it formerly was in the treatment of tuberculosis. Change of air and scene and sea voyages are still considered effective in the early stages of the disease, if combined

with careful medical supervision, and good diet. The danger at the present time is in reliance on climate alone for the cure of consumption. Sir Hermann Weber, who is the great authority on the subject of climate in the treatment of tuberculosis, advised that those in whom the disease was extensive or progressive should not be sent far from home. In opening his paper he said:—"While he still held that climate is really important, it is insufficient unless there be careful medical supervision and hygienic and dietetic guidance." In summing up he spoke as follows:—

"In cases with limited disease at one or both apices of the lungs without, or with only a slight amount of fever, nearly all climates can be made use of, but especially high altitudes and sea voyages, if the constitution is a strong one.

"For the prevention of scrofula and tuberculosis all healthy climates can be used, as long as a good diet and plenty of time in the open air can be obtained; but high altitudes and marine climates have advantages—the former rather against pulmonary tuberculosis, the latter (including sea voyages) more against scrofula.

The cure of tuberculosis during the early stages is possible in all healthy climates; some climates, however, have advantages for various cases over the other climates; for instance, notably those of high altitude. But climate by itself without careful medical supervision is generally insufficient. The patient's blind reliance on the climate often leads to errors, to aggravation of the disease, and to death. For the majority of patients, therefore, treatment in sanatoria should be preferred, but for the treatment of the poor it is a necessity. The erection of numerous sanatoria for the people is therefore a national requirement for the cure, the prevention, and extermination of tuberculosis."

Professor Brieger, of Berlin, spoke favourably of Koch's tuberculin in both its first and latest form. It was, he said, a specific. If used in the early stage when the infection was purely tuberculous, he considered it of value as a means of treatment. On one point, however, there was no question, namely, the value of Koch's first tuberculin as a means of diagnosis in men and animals.

By other speakers the efficacy of open air, day and night, good food, (the diet should be full and suitable to the patient), disinfection, and the judicious use of alcohol, stimulating the skin by cold water affusion to the chest and body, with brisk rubbing, were recommended very strongly. The necessity of considering the body weight in estimating the results of treatment was also mentioned.

SECTION V.—SANATORIA.

Professor Von Leyden sketched the growth of the Sanatoria treatment of tuberculosis in Germany. In 1880 the subject was first considered and subsequently taken up by prominent medical authorities up to 1892, when the People's Sanatorium in Falkenstein was started. From this time the movement spread rapidly, the Imperial Insurance Company, the Berlin-Brandenburg Sanatoria Society, the Red Cross Societies, each established sanatoria; then more united action was brought about by the formation of the Central Committee for the establishment of sanatoria, with Prince Hohenlohe, the Imperial Chancellor, as president. There are now thirty-three sanatoria in Germany.

Landesrath Meyer discussed the question of the "ways and means" for the establishment of sanatoria for the people. He claimed that apart from the duties of governments and the efforts of charitable persons and societies, there was a special obligation upon those who were likely to be benefited by the creation of sanatoria for consumptives; for instance, it was in the interest of large employers of skilled labour that the health of their workmen should be preserved. Life insurance companies and workmen's clubs were directly interested in the lives and health of the insured. The large death-rate from tuberculosis was a great drain upon these institutions.

Papers were also read on the situation and plans of construction of sanatoria. A sheltered neighbourhood in the country or so far from any town that there is freedom from smoke and dust, exposure to the sunshine, with good water supply and perfect drainage were insisted on in the selection of a site. In the construction of the build-

ing, the application of all the modern improvements, now so well known, to procure perfect sanitation, and plentiful supply of pure air were required. Sanatoria for children should be at the sea-shore. Weakly children or those with a tendency to tuberculosis should have the benefit of sea air and salt bathing. These are the most valuable tonics for children.

The foregoing is but a brief synopsis of the work done at the congress. Many valuable papers presented were not read for want of time; but, as can be easily seen, the whole subject was thoroughly considered in all its sanitary and medical aspects.

Having dealt briefly with the transactions of the Berlin congress, I may perhaps be allowed to set forth for the information of the Government and through them of the people of Canada what I deem to be the lessons of the congress.

The object of the meeting was not to develop any new idea nor to state any new fact to medical men who have been following the progress of our knowledge on the subject of tuberculosis in recent years. The patient, quiet labour of the bacteriologist and pathologist in the laboratory, the daily study of the doctor in the hospital ward, and the work of the statistical bureau are commonly hid from the public eye. The results of their work are made known almost exclusively to the profession through the columns of medical journals. Such large public gatherings as these serve the purpose, then, of crystallizing into form our recent advances in medical science. They also attract public attention and become a source of enlightenment to the people on subjects intimately associated with public health.

The paramount importance of making known the recent acquisitions to our knowledge of the nature and causes of tuberculosis is now generally acknowledged; and it has become a necessity that the public should begin to grasp the main facts and to understand that thousands of valuable lives can be saved by basing our action upon the truths brought to light by recent discoveries.

That we may be impressed with the necessity of vigorous action, let me state that the disease is not limited, as people generally suppose, to cases of pulmonary consumption, common and fatal as these are, but embraces a large number of diseases, many fatal to life and others producing conditions of long-continued and almost hopeless invalidism or rendering the sufferer incapable of a useful life. The following list of diseases which have their origin from the tubercle germ will convey some idea of the wide-spread nature of tuberculosis:—

- (1.) Consumption of the lungs.
- (2.) Almost all cases of running sores from chronic joint and bone affections, such as hip-joint disease.
- (3.) Consumption of the bowels.
- (4.) The so-called scrofulous affections.
- (5.) Most of the cases of pleurisy.
- (6.) Meningitis or the brain-fever of the infant.
- (7.) Tuberculosis of the spine, producing curvature of the spine or "broken back."
- (8.) A large proportion of the cases of enlarged and diseased glands.
- (9.) Lupus and other tubercular diseases of the skin.
- (10.) Consumption of the bladder and other parts of the genito-urinary system.

It is only necessary to ponder upon the foregoing list and one is prepared for the statement that the death-rate from this disease must be large. The mortality is in fact enormous, being estimated by some authorities to be one-sixth of the deaths from all causes. In its ravages it is not limited to any one part of the world, but seems to follow population everywhere. It is destructive of life at all ages and in both sexes. Unfortunately, it occurs most commonly, and is most fatal in young adults, at a period when life is most precious to the individual, the family and the state, and even in cases where life is saved, the body is often so maimed and crippled, that a useful life, if not wholly lost, is greatly lessened. Bergy, in an article on bovine tuberculosis (*Medical News*, 23rd January, 1897), claims that "tuberculosis has produced more deaths than small-pox, diphtheria, scarlatina, typhus fever, typhoid fever, yellow fever, cerebro-spinal fever, Asiatic cholera, relapsing fever, leprosy, measles, and whooping cough, combined."

Dr. Kohleh made the statement at the congress, that in the four years 1894-1897, the yearly average number of deaths from pulmonary tuberculosis in Germany was

87,600; this represents 2.95 per 1,000 persons out of a total mortality of 9.1 per 1,000. Dr. Kuthy, of Buda Pesth, stated also during the discussion, that consumption caused 60,000 deaths a year in Hungary, while the number suffering from the disease was 400,000.

It is difficult to estimate with accuracy the death rate from this cause in Canada, as we have not a complete system of vital statistics, but it is probably nearly as large as it is shown to be in those countries where an account is taken.

The disease is produced by the tubercle germ or bacillus. There is no longer any room to doubt this fact. This germ is the direct cause; the seed from which consumption springs. Since the discovery of the germ, twenty years ago, by Koch, every step in the progress of our knowledge has made this point certain.

Tubercle germs are living organisms though microscopic in size, with enormous powers of reproduction in a favourable soil. It is said that an advanced case of pulmonary consumption throws off millions of bacilli in an hour. They live and grow only in the animal organism but they have feeble powers of life outside of living animal tissue. They are easily destroyed. "Direct sun-light soon kills them, putrefaction destroys them in six or seven weeks and desiccation in six to ten months, they are only found in the immediate vicinity of consumptive patients, and when their producer is removed they disappear." This view was presented by Prof. Frankell of Halle, in one of the most forcible and learned addresses heard at the congress. This is the most favourable statement yet made in regard to the low vitality of the organism outside of living animal tissue; many having held that tubercle bacilli were almost ubiquitous in their infective condition. Later investigation and experiment have settled the fact that the infection is practically limited to the surroundings of a patient suffering from the disease. It follows also that they hold their poisoning power longer in dark, damp, ill-ventilated and sunless rooms and houses.

The tubercle germ is derived solely from the excreta of tuberculous sores, and as lung consumption is the most common form of disease, the most prolific source of the poison is the expectoration from a diseased lung. It is this—the sputum of a consumptive patient, which spreads disease and death through a family and in its neighbourhood. How this occurs is easily understood. It arises most commonly from the careless and uncleanly habit, so common, of spitting upon the floor, upon carpets or mats, into dark corners and behind beds and other articles in a room, particles of the expectorated matter often adhering to the bed covering, the furniture or hangings of a room. It also occurs in the store, warehouse, factory or workshop, in railway carriages, street cars, public halls, places of amusement, &c., these are being constantly contaminated by the sputum of the consumptives. It dries in a few hours, and the ordinary dusting or sweeping of the place stirs up the dust loaded with virulent germs, the dust is breathed by the susceptible, and thus consumption is spread to the extent we find it in the world to-day.

It can be stated without fear of contradiction that if, as a result of education, persuasion or legal enactment, all expectorated matter from tuberculous patients was thrown into a vessel containing a small quantity of five per cent solution of carbolic acid or any other effective germicide, the number of cases of consumption existing in this country could be reduced over one-half within five years.

The disease is not truly hereditary, that is, the tubercle germ does not descend from parent to child. It is true that the children of consumptive parents are more liable to "catch" the disease as they are born with systems which are weak, with tissues of low vitality and with less power of resistance. They present a favourable soil for the growth of the germ; this question of a favourable soil will be considered more fully further on. There is another source of tubercular infection which has attracted much attention of late years: the meat and milk of tuberculous cattle. It is now well known that the disease is very prevalent among cattle and pigs and to a limited extent among poultry. Tuberculosis in animals is identical with human tuberculosis. Cow's milk is the greatest source of danger. From fully cooked food there is very little danger of infection, therefore the meat of tuberculous cattle is not likely to be harmful as the prolonged heat required in cooking destroys germ life. The milk of a tuberculous cow is what we most fear. In a paper read at the congress, Virchow, who is not only one

of the most distinguished scientists of Germany, but is also a prominent member of the Reichstag; he claimed that milk was one of the chief spreaders of this disease. It is yet perhaps unsettled whether the milk of tuberculous cows, as it comes from the milk gland is always infectious, but as tuberculous sores on the udder of the cow are a very common lesion of bovine tuberculosis, when a cow so affected is milked, the milk becomes infected by the sore on the cow's teat and can easily produce consumption. Though milk is a source of infection to which public attention should be given, still it is trifling as compared with the sputum of the consumptive patient.

It is now clear that we must deal with this disease as an infectious one, just as we now deal with smallpox or diphtheria. We may not need to isolate a case of consumption, in all its stages, as completely as we isolate these diseases, but now that we know the source of infection, since science has proved the sputum from the diseased lung to be almost exclusively the origin of the infective matter, stringent measures should be taken as soon as possible by governments, boards of health, and sanitary authorities to prevent the wholesale poisoning of the people which is constantly going on, more particularly in the vicinity of cases of tuberculosis.

To do this we must destroy the germ either by burning, boiling or by chemical disinfectants. All expectorated matter from a consumptive patient must be disinfected. This is now a simple and easy procedure, so easy that it will only be necessary to inaugurate a campaign of education, so that the families and friends of consumptives may see the great danger to which they are subject unless proper precautions are taken. To a large proportion of our intelligent population it will only be necessary to point out the fact that the source of tuberculous poisoning is the expectoration from the diseased lung and that this can be easily destroyed, in order to bring about such a change in our present habits of carelessness and uncleanness in dealing with it as will very materially lessen the disease rate from tuberculosis in Canada in a very short time.

As it is the excretion of the diseased lung which contains the poison, the question will naturally be asked: Is the breath of the patient infectious? In the early stages of a case and in mild slowly progressing cases *it is not*, but in the later stages when the lung is breaking down and millions of germs are thrown off every hour, *the breath in such a case is infectious* and can convey the disease. The frequency of disease and the number of infective germs which are, in consequence, floating in the air will also lead to the inquiry: Why are we not all of us infected if this germ-life is spread about so freely? The answer is simple. In all contagious disease due to germ life there is another factor required, that is the soil in which the germ will grow. The tissue of some persons presents a favourable soil, while in the tissue of others, the germ will not grow.

In the course of our study of disease-producing germs and their effects on the human system, the grand truth has been elucidated that our tissues in the process of vital action constantly going on in them have a strong resisting power against germ-life, that there is implanted in our nature not only the power of growth, development, and reproduction, but also a power of resistance against germs. This last named function is as natural to us as either of the others which are so well understood. Some persons and some systems have more power of resistance against this disease than others. All persons who inhale or ingest tubercle germs do not contract consumption as their tissues do not furnish a favourable soil. This resisting power against disease is increased or lessened by heredity, by our mode of life, our surroundings, habits as to eating and drinking, and by all the circumstances which tend to lower the vitality of our tissue on the one hand, or to improve it on the other. As a general rule it may be stated that the lower the vitality of tissue is, the greater is the liability to microbic disease. A person whose standard of health is low presents a favourable soil for the growth of disease-germs, while the tissue of a healthy well nourished individual is an unfavourable soil. This is especially true of the tubercle bacillus; if the body be well nourished and in vigorous health it finds no soil for its growth and is harmless when inhaled or ingested. It must be borne in mind, however, that a person in the best of health and whose tissues are best equipped to resist tuberculosis, if exposed continuously and for a length of time to large quantities of the poison such as may occur when a wife, sister or friend nurses a patient in the last stages of consumption, often sleeping in the same

room, under these circumstances the best resisting power may be overcome and the healthiest and strongest may contract the disease. This, however, only occurs under such exceptional circumstances.

Unfortunately we often find, especially in cities and crowded localities, the same circumstances which preserve the virulence of the germ produce among the dwellers therein the favourable soil. The tubercle germ retains its power of infection for the longest time in the vicinity of the tenement house, in the close unventilated room where the sun's rays rarely enter, in dark damp places with noisome and unwholesome surroundings, and as a rule the persons who live in these localities are subject to many circumstances which lower their resisting power and make them an easy prey to the contagion. But not alone in the homes of the poor, but very often in the comfortable household of the farmer and in the richly furnished homes of the wealthy classes we find many conditions favourable to the growth of tubercle germs. How often one finds the rooms in such a home overheated in the winter months by steam or hot water coils, without an open fire place, windows caulked or pasted up, so that there is but little chance for the entrance of fresh air or the discharge of foul air. In such a room the consumptive patient lives, the expectoration is often carelessly disposed of, even though there may not be absolute uncleanness; the room is darkened with shutters, blinds and curtains, through which hardly a ray of direct sunlight is allowed to penetrate. To this sick room the members of the family come and go freely, their tissues have probably a low resisting power on account of heredity and other causes. No precautions are taken to avoid infection; the weakly child is allowed to rest or play or may be to sleep there for many hours. Under such circumstances it can be easily seen how tuberculosis is spread even in the homes of the well-to-do classes.

In considering the means to be taken to stamp out tuberculosis let us start with this axiom: *No tubercle germ, no consumption. An unfavourable soil for the growth of the germ, no consumption.*

Next to the destruction of the bacillus the most necessary point to be learned by the public is the danger to which they are subject, if a good standard of health is not maintained.

It would be well for us to consider some of the causes which lead to the production of this lowered vitality of tissue and lessen its resisting power. Among these are, first, an inherited weak system: this is the cause of a very large death-rate from tuberculous disease in the first two years of life. Dyspepsia again always produces an ill-fed tissue and is at the present day one of the most common causes of a low resisting power against disease germs; the life of the debauchee, alcoholism, irregular living, business worry, residence in close, ill-ventilated and sunless rooms, lack of cleanliness, and a continuous in-door or sedentary life such as obtains in the business office and factory are among the principal causes. To prevent consumption, then, we must (1st) kill the germ, (2nd) have good health and nourish the body well with good food, sunlight and fresh air.

The point to be kept prominently before the public is that *tuberculosis is infectious. In most cases in which many members of a family are attacked and die of the disease, it is not on account of inheritance, it is due to an infected house and to contact.*

The congress dealt fully with the whole question of prevention and treatment. How shall we destroy the tubercle germ? To do this every means must be taken to prevent the sputum from consumptives from being spit about, where it will dry and float about as infective dust. Sanitary authorities must make such rules, which can only be carried out with the assistance of an enlightened public opinion, as will prevent spitting in public places, such as public buildings, halls or places of amusement, railway carriages, street cars, schools, factories or workshops. These should be provided with proper receptacles in sufficient number, and they should contain some cheap disinfecting fluid. Public notice should be given, cautioning families among whom consumption exists, or has existed, of the danger to which they are subject by the presence of the infective tubercle germ, and that this can be prevented by having their rooms disinfected as they would after a case of diphtheria or scarlet fever. The public should be instructed as to the value of sunlight and fresh air as natural disinfectants. Medical men should recommend, and boards of health should require, that

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sick-rooms of the consumptive should be frequently disinfected. Again, all their underclothing, handkerchiefs, bed linen and the like should be boiled for half an hour before being washed, and dry dusting and sweeping should be abolished as a means of cleanliness. This last precaution is one which is much needed, for I believe the broom and the dust-brush are responsible for many deaths from tuberculosis. We are all familiar with the method by which the careful housewife cleans her rooms—usually once a week. The mistress and the girls, or the servants, as the case may be, cover their heads with cloths to keep the dust out of their hair, but leave the mouth and nose uncovered, so that it may have free access to their lungs, and they proceed to apply the broom and dust-brush vigorously to the floor and halls. The air of the room is soon filled with dust, so that one can hardly see through it. There can be no more certain means of producing tuberculosis than this. It is only necessary to suppose, as is often the case, that the carpet or floor contains the virulent germ, that the poor sweeper is susceptible and the consequences are easily foretold.

There is one other source of tuberculosis, though it is probably more often a cause of other infections, which is not considered by the authorities but which I will venture to mention here. I refer to the common habit of taking food during meals or at other times without washing the hands. It may be said that among refined people this does not occur, but even among these only a few are careful, and outside of this limited number of people no attention is paid to the point. Numbers of working people neglect this precaution, and even among the better educated many are careless; the bank clerk or the broker takes his lunch while he is counting dirty bank notes, which, passing as they do from hand to hand, are often loaded with disease germs; the merchant and the storekeeper leave their counting room and shop to take a hurried lunch after handling all sorts of things which may be infected, so that the neglect of this simple act of cleanliness may be often the means of conveying disease.

While we loudly proclaim, then, that we can prevent consumption, let it be a source of comfort to the people that it is also curable. It is true that the proportion of cures yet obtained is not large, but the sanatoria established for the purpose are reporting better results each year since they were started. We have not yet obtained any specific remedy, but in the laboratories of science, faithful effort is being made to discover an antitoxin, which may be used without danger, to overcome the disease and destroy the poison, as it was hoped the tuberculin of Koch would do when it was first made known to the world.

A short discussion of the subject of cure will not be out of place now, although this part of the subject is of more interest to medical men. The destruction of the tubercle germ will be the most important factor in lessening the severity and fatality of cases in the next few years. In the home of a consumptive family it is almost impossible to work a cure on account of the immense quantity of the poison which is being constantly breathed or swallowed. The invading army of germs is so strong that ordinary remedies or treatment of any kind is valueless. Even with improved methods we cannot for some time look for a large proportion of cures in private practice, that is, outside of sanatoria, but when these millions of microbes which are floating about the homes of consumptives are to a great extent destroyed, then we may expect that with careful treatment we shall save the lives of fifty per cent more than we do to-day.

It is only in the early stages that treatment of any kind promises a good result; when the disease has fully established itself and the lung tissue is breaking down, the case is hopeless. It is easy to sum up the treatment under four heads:

- (1st.) Sunlight, open air, rest, dry soil for the home.
- (2nd.) A good digestion and contentment.
- (3rd.) An abundance of strong food, which should be taken to the limit of the digestive power.
- (4th.) Medication of a constructive character such as iron, cod liver oil and the like with a moderate quantity of wine, beer or other stimulants.

Of direct sunlight both for prevention and cure, too much cannot be said. It is doubly effective, acting both as a natural tonic to the system and a destroyer of the tubercle germ. The advantages of fresh air and an out-door life are too well known to need much consideration, but though most intelligent people are theoretically in

favour of fresh air, still in practice, especially during our winter months, the necessity is forgotten, and to many an in-door life and over heated rooms with lack of ventilation is the rule. We are all familiar with the fact that persons whose occupations are indoors, such as school teachers, typesetters, dressmakers, book-keepers, tailors and factory operatives, are very prone to tuberculosis.

The importance of a dry soil for the home must not be lost sight of. In houses which are damp and especially if built upon wet soil, consumption is most common.

At the present day there is probably no more common cause of low vitality and weakened tissue than dyspepsia. It may be called the fruitful mother of disease. Its baneful effects are numerous, but one of the most serious is that of lessening the resisting power against the tubercle bacillus. The copious draughts of iced water, bad teeth, fast eating, excessive use of alcohol, with the mental excitement and worry of modern business life are constantly undermining the organs which safeguard the body and furnish strength to the system. If we wish to avoid consumption we should keep the lung tissue strong and this we must fail to do if we destroy the food-factory—the stomach. The dietetic treatment stands side by side with sunlight and fresh air, and next to the destruction of the germ in the sputum, in our endeavour to prevent and cure tuberculosis. Dettweiler, who was one of the pioneers of the sanatorium treatment recommended “a proper system of feeding adapted to the needs of each patient and when it could be safely done, in over-feeding to a certain extent, with a moderate quantity of alcohol.” The body weight must show a gradual increase. This is the only safe test of the fighting power of the tissues. If the body weight will only show a slight gradual increase under treatment then the lung is becoming a more unfavourable soil for the growth of the germ.

While much was said at the congress about milk as a source of contagion, there did not seem to be sufficient attention given to the great value of milk as a food. Good pure milk properly taken and digested is one of the most valuable foods we have. It is one of the very few articles of diet which contains all the elements for the nutrition of tissue, and when pure and rich it is invaluable as a food both for the prevention and cure of consumption. A pint of good milk has more value as a nutrient and tissue builder than a bucket full of soup, beef-tea, bovril or meat extract of any kind. It is a food, *par excellence*, of the young. To have its full value it must be not only rich in cream but it must be pure. In case there is danger of infection in the milk, it should be pasteurized, that is, treated twice at least to a temperature of 160° F.

There are two ways in this country by which children are robbed of their milk supply. One is the habit of giving young children tea as a drink at their meals just as it is taken by the parents. The habit is injurious in two ways, the tea, as it is generally made, may be harmful and it prevents the child taking so much milk. Another habit among farmers, which may not be very common, but which occurs often enough to be noticeable, is to take the largest amount of cream possible from the milk to make butter for the market and to feed the children on skim-milk. By these means a great wrong is done to the child; its tissues are ill-nourished and it becomes an easy prey to the tubercle germ. Is it not possible that feeding skim-milk to calves has the same effect in the production of bovine tuberculosis?

The necessity for special sanatoria for treatment can no longer be looked upon as the view of a limited number of authorities; there is now a consensus of opinion among medical men that tuberculosis cannot be treated successfully in private houses. It is difficult to do so among those who are well housed and comfortably off, but it is almost impossible among the poorer classes, so that there are now being established, in all countries which have given attention to the subject, special sanatoria for this purpose.

The treatment demanded under our present plan: open air, sunlight, good food and proper feeding, sponge baths, with careful medication, and medical supervision, can only be carried out when a patient is surrounded by all requisite appliances.

It should now be made the rule that pulmonary tuberculosis can not be admitted to the wards of a general hospital. To do this is a double wrong, as it is an unfit place to carry out a plan of treatment which will give the consumptive even a fighting chance for his life (and at best this is all he has), and again it is unjust to the other

patients, as they are exposed to the contagion and are in danger of contracting a new and fatal disease, instead of being cured of that for which they entered the hospital.

When I was a house physician to the Charity Hospital, New York, some years ago, a circumstance occurred, the force of which can now be understood. It was deemed wise by the governing powers of the hospital to put all cases of consumption in one ward, and as no precautions were taken except ordinary cleanliness as to infection, this ward was soon reeking with tubercle bacilli, so that treatment was as futile as an endeavour to stem the rising tide. One day when I was on duty in the distribution office, where the patients were allotted to the various wards, a poor woman whom I had directed should be sent to the ward I mention, looked up at me with an appealing glance and said: "Oh, doctor, do not send me to that ward; I have heard that no one ever comes out of it alive." For the poor, then, especially, sanatoria must be provided either by governments or by private charity or both. How we are to get them must be left for further consideration.

During my stay in Berlin, I visited the sanatorium at Grabowsee, so that I might have a better idea of the practical management of such institutions, the requirements of which a description of this sanatorium will indicate. It is situated on a wooded hillside with a gentle incline, but only slightly above the level of the surrounding country. It has a southern aspect. The soil is dry and porous and the green sward is preserved as far as possible to avoid dust. It is also sheltered from severe winds. It is arranged on the pavilion plan, each pavilion containing eight beds. These are but sheds with large windows on each side. There were also open pavilions or covered verandahs for shelter in case of rain. An executive building contained offices, bath rooms, billiard room and weighing room. It was heated with hot water coils, and the patients' pavilions with an open fire. In two separate buildings were: in one the sterilizing room and laundry, and in the other the dining room and kitchen. The floors of the pavilions were covered with linoleum. Accommodation was provided for one hundred and sixty patients. As far as possible only those in the first stages of the disease were admitted. Every detail of treatment was carried out under medical supervision. The patients were obliged to live all the time in the open air, and about the lawns were scattered extension chairs in which the patients rested, being well wrapped up if the day was cold. A daily bath was given, in the beginning warm, but the temperature gradually lowered each day to a cold bath, as the patient improved. A very full diet was given with plenty of sterilized milk and a moderate quantity of wine or beer. There was more rest than exercise prescribed, but the amount of each was under the direction of the medical officer. *It was considered a serious offence to expectorate upon or about floor or grounds. A violation of the rule was severely punished.* Each patient was provided with a small wide-mouthed dark glass bottle with a tight screw cap which he carried in his pocket as a receptacle for the sputum; this was sterilized as often as necessary.

This report is already too long, but I found it difficult to deal with the subject in a shorter space. I will conclude with the hope that the Dominion Government, in concert with provincial and municipal authorities, will see the pressing need there is, both for humane and economic reasons, to begin such a campaign against tuberculosis as will stamp it out of Canada in a few years. In writing this report I have avoided using medical terms as far as possible so that the Government could, if it was thought well to do so, submit it to the sanitary authorities of districts in the country where public opinion has not been aroused on the subject.

I have to acknowledge much kindness at the hands of Lord Strathcona and Mount Royal, and also from Sir Francis Lascelles, the British Ambassador at Berlin.

All of which is respectfully submitted.

EDW. FARRELL, M.D.

