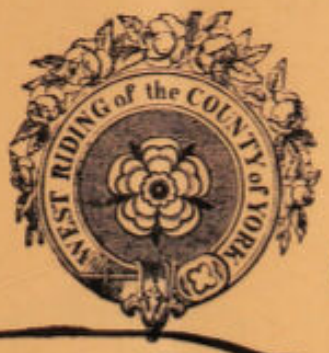
WEST RIDING  COUNTY COUNCIL.

REPORT

ON

THE BRITISH CONGRESS ON TUBERCULOSIS,

JULY, 1901.

Minute No. 1260 of the West Riding Sanitary Committee:—"That the Chairman and Vice-Chairman of the County Council, and the Chairman and Vice-Chairman of the Committee, and the County Medical Officer and Clerk, be authorised to attend the Congress as the delegates of the County Council."

Wakefield:
W. H. MILNES, PRINTER AND PUBLISHER.

With the Compliments

of the

County Medical Officer of Health.

County Hall,
Wakefield,

West Riding of Yorkshire County Council.

REPORT

ON THE

BRITISH CONGRESS ON TUBERCULOSIS,

July, 1901.

The first British Congress on Tuberculosis was held in London, from July 22nd to 26th, 1901. The initiative in promoting such a Congress was taken by the National Association for the Prevention of Consumption, who secured the patronage of His Majesty the King, and invited the co-operation of Sanitary Authorities and others interested throughout the kingdom. The West Riding County Council contributed to the expenses of the project, and sent representatives to take part, both in the preliminary meetings and in the Congress. Subsequently, the West Riding Sanitary Committee felt so strongly the great importance of the matters dealt with that they directed this report thereon to be drawn up and circulated.

The real work of the Congress commenced on Monday, July 22nd, when the General Meeting was opened in St. James' Hall, by F.M. H.R.H. the Duke of Cambridge, K.G., on behalf of the King. On the following four days, Sectional Meetings were held in the forenoons, and General Meetings in the afternoons.

In order to get through the vast amount of important work, the Congress was divided into four sections, meeting simultaneously at different halls, and the work of the chief section was again cut up in several divisions, as follows :—

Section I. State and Municipal. President, The Right Hon. Sir H. Maxwell, Bart., F.R.S.

Division I. Statistical.

„ II. The Notification of Tuberculosis, and the Prevention of the disease during childhood.

„ III. The Influence of Housing and Aggregation, and the Control of Meat Supplies.

„ IV. The International Aspects of Tuberculosis, and the Control of Milk Supplies.

Division V. The Provision of Sanatoria, and the Rôle of Hospitals and Dispensaries for Consumption in the Prevention of Phthisis.

Section II. Medical, including Climatology and Sanatoria. President, Sir Richard Douglas Powell, Bart., K.C.V.O., M.D.

Section III. Pathology and Bacteriology. President, Professor G. Sims Woodhead, M.D., F.R.S.E.

Section IV. Veterinary (Tuberculosis in Animals). President, Sir George Brown, C.B.

In addition, there was established a museum, wherein were exhibited specimens relating to every branch of the subject. In the statistical section of this museum a series of six charts was shown on behalf of the West Riding Sanitary Committee, to illustrate the incidence of Tuberculosis in the West Riding during the last half-century. The extent and completeness of the museum may be judged from the fact that the catalogue comprised nearly 200 pages of an octavo volume.

A very large number of original papers were communicated to the various sections, and the valuable discussions which followed called forth the opinions of the most eminent workers in every phase of the great crusade against tuberculosis. From the enthusiasm and interest exhibited among the numerous delegates who attended the Congress, one can only prophesy the best results.

Having regard to the reasonable length of this report it is impossible to refer to the various papers in any detail, or even to mention many of them individually. All that can be done is to present collectively some of the facts which were brought out, and make special reference only to a few of the papers having the greatest general interest and appearing most likely to advance public opinion.

In this report it is proposed to deal with the subject as far as possible under two headings (1) General, (2) Remedial.

PART I.—GENERAL.

The mortality from consumption varies according to the country and nationality. In England and Wales the *deaths* alone are upwards of 40,000 annually, while ten times that number may be assumed to be *sufferers* from what has been aptly termed "the white man's plague," *i.e.*, pulmonary consumption. Looking to the boundless misery caused by the disease, it is almost a matter of surprise that the first British Congress on tuberculosis should have been delayed until now. But the general apathy of the past can be accounted for in various ways. (1) The disease has been considered incurable, and there are still those who doubt the possibility of successfully combating it. (2) It has been generally agreed that consumption was hereditary and its method of dissemination was not understood. (3) By many it was thought to be unavoidable under certain circumstances.

In 1882, Professor Robert Koch upset all those ideas by demonstrating the agent of infection, thereby opening up a new hope to humanity and imposing a well defined duty upon all Sanitary Authorities. Prior to that England had turned her attention to the dwellings of the labouring classes and the poor. Some success followed this and other social steps, so that to-day we can rejoice that, during the Victorian Era, the mortality from consumption has been reduced by fully 40 per cent. Encouraged by that fact, and in the light of recent experience, increased efforts are being made towards the entire subjugation of this fell disease; and to that end the present Congress cannot fail to have contributed.

Dr. Koch's Paper.

The place of chief importance among the papers read at the Congress must naturally be given to the contribution by Professor Dr. Robert Koch, the eminent discoverer of the bacillus of tuberculosis. He dwelt briefly upon the magnitude of the suffering and misery traceable to tuberculosis and pointed to the change of opinion in recent years, for whereas formerly we did nothing but rely on the probable improvement of social conditions, now we know that the real cause of the disease is a parasite which can be pursued and annihilated.

Professor Koch drew attention to the success which has already been achieved in restricting several other parasitic diseases and he emphasised the lesson that each pestilence has to be treated according to its own special individuality; the means to be taken against a given disease must be accurately adapted to its special nature or causation. He illustrated this lesson by the following points:—(1) *Plague* has been considered as being spread by the victims and their belongings; but in regard to bubonic plague the real transmitter of disease is now found to be the rat of ocean traffic. (2) *Cholera* may be transmitted directly from human beings to their fellows, but its main and most dangerous propagator is water and therefore that is now the first thing to be considered. *Hydrophobia* and *Leprosy* were also separately referred to as further examples of diseases each requiring for its suppression a particular line of action.

The question raised by Dr. Koch on these examples was "whether "what has hitherto been done, and what is about to be done against "tuberculosis, really strikes at the root of tuberculosis so that it must "sooner or later die."

The dissemination of lung consumption, it must be admitted, results chiefly from inhalation of the germ which has been ejected from the lungs of a diseased patient. The sputum of patients advanced in consumption often contains incredible numbers of bacilli. These are flung into the air by coughing, and even speaking, and may at once infect bystanders; or the infected sputum may be deposited on to floors, walls, soil, linen, etc., and, becoming dry, the bacilli get into the air along with the dust. *The sputum of consumptive people, therefore, is the main source of infection in Tuberculosis.*

Koch then proceeded to enquire whether the other sources of infection are copious enough to demand consideration in the fight against the disease. He promptly disposed of hereditary transmission, as being so extremely rare that it may be left out of account. He next

discussed the transmission of the disease from tubercular animals to human beings. He admitted that this is generally regarded as proved, but he had formed an opinion deviating from that generally accepted and he proceeded to give his reasons.

Tuberculosis has been observed in all domestic animals, but the only serious channel through which animal-tuberculosis might be conveyed to man (if transmissible) would be by cattle, whose milk and flesh we consume. Professor Koch explained that when first he discovered the tubercle-bacillus he had not the full means of sharply distinguishing between bovine and human tuberculosis, and his subsequent experiments upon small animals were not sufficient to afford a satisfactory conclusion; but so soon as he was able to carry out experiments on cattle he obtained the following important results.

Young healthy cattle ascertained to be quite free from tuberculosis were fed upon, or inoculated with, or caused to inhale great quantities of bacilli from human sources. Some of the animals were fed upon tubercular sputum almost daily for some months. Yet none of the cattle under any conditions showed symptoms of the disease, and when subsequently slaughtered their internal organs were free from any trace of tuberculosis.

Experimenting similarly with bovine tubercle-bacilli the results were the reverse, the cattle proving as susceptible to infection by the bacillus of bovine tuberculosis as they had proved insusceptible to the human bacillus. This distinction was further corroborated by feeding swine with infected material: infected human sputum produced no bad effect, but the swine which had eaten bovine bacilli soon became diseased. Koch pointed to experiments made by other observers in former times, and also recently in America, which led to somewhat similar results, and he therefore maintains that human tuberculosis differs from bovine, and cannot be transmitted to cattle.

He then proceeded to deal with the far more important question 'Is man susceptible to bovine tuberculosis'? Direct reply is impossible, but he endeavoured to approach it indirectly. The milk and butter supplies of this country often contain large quantities of the living bacilli of bovine tuberculosis. That has been repeatedly proved by inoculating small animals with such dairy products. Therefore the inhabitants who regularly consume such food actually carry out unintentionally an experiment which we are not directly permitted to make; and if infection is possible, then numerous cases could not but occur, especially in children. But, as a matter of fact, says Koch, that is not so. Such cases would be those in which the intestine suffers first, and these, he asserts, are extremely rare. Dr. Koch himself has only seen two cases of primary infection of the intestines, out of many cases of tuberculosis examined after death, and he gave figures from Continental Institutions pointing to the same rarity of this form of infection. Moreover, with regard to these few cases, it is not by any means certain that the infection did proceed from bovine sources, for the human bacilli might have found its way into the food and been the cause of the mischief. As to this Dr. Koch outlined a method of investigation which may in the future afford a

means of diagnosis. He added, "Though the important question whether "man is susceptible to bovine tuberculosis at all is not yet absolutely "decided and will not admit of absolute decision to-day or to-morrow, one "is nevertheless already at liberty to say that, if such a susceptibility really "exists, the infection of human beings is but a very rare occurrence. I "should estimate the extent of infection by the milk and flesh of tubercular "cattle, and the butter made of their milk, as hardly greater than that "of hereditary transmission, and I therefore do not deem it advisable to "take any measures against it."

So that, according to this eminent authority, the only main source of infection lies in the sputum of infectious persons, and therefore the measures for the suppression of tuberculosis must be concentrated on that danger entirely. Professor Koch went on to deal with the ways and means of doing this, but we may leave that for the present to glance at the opinions of other eminent speakers who differed from Koch in the foregoing conclusions.

Replies to Dr. Koch.

Lord Lister who was in the Chair, at once challenged the deductions of Professor Koch, and particularly the opinion that bovine tuberculosis was not transmissible to man. Reference was made to the extreme difficulty of inoculating the calf with human small pox, in consequence of which small pox and cow pox had been regarded by some as distinct diseases. Recent experiments had shown, however, that this operation could be quite successfully performed if the virus had first passed through the monkey, so that the cycle "man, monkey, calf and child" has been established. Lord Lister stated that Koch's alleged rarity of intestinal lesions did not hold good in this country, and moreover the assumption that such a lesion is always a necessary accompaniment of infection through the bowels is not in accordance with one's experience of enteric fever, the germ of which occasionally passes through the intestine and infects the host without producing any characteristic lesion of the bowels.

Professor Nocard agreed with Lord Lister and considered that the reduction in the mortality from Phthisis in England justified the restrictive measures regarding the food supply.

Professor Bang admitted that the danger of infection from tubercular animals might be small, yet it had not been found that infection could not occur.

Professor Sims Woodhead also held the view that bovine tuberculosis played some part in the genesis of the disease in man.

It will be convenient here to discuss the paper given by Professor McFadyean which constituted the chief reply to the foregoing arguments of Koch.

Professor McFadyean stated that the identity of human and bovine tuberculosis is generally supposed to have been finally determined by Koch himself. He at one time held that the bacilli in human and bovine lesions partook of similar characters, and that artificial cultures from both sources produced indistinguishable results when they were employed to infect a

variety of animals. For eighteen years no adverse evidence has been put forth by any of the numerous investigators; in fact, additional testimony was produced in the discovery that tuberculin gave a specific reaction in tubercular cattle whether human or bovine bacilli had been employed in the preparation of such tuberculin. Opinions have varied as to the frequency of human infection by tubercular milk, but not as to the possibility of reciprocal infection.

Dr. Koch's line of reasoning was reduced by Professor McFadyean to three broad arguments which he proceeded to state and criticise somewhat as follows:—

(1) *The greater virulency of bovine bacilli for cattle and other quadrupeds compared with the human bacilli.*

This is not denied, but, said McFadyean, it in no way proves that bovine bacilli have only a feeble disease-producing power in man. It is well known that other disease-exciting bacteria which are common to all domesticated animals are also pathogenic to man. If therefore bovine tubercle bacilli are harmful to such a variety of quadrupeds it is highly probable they are dangerous to man.

(2) *The difference of virulence is so marked and so constant that it may be taken as a means of distinguishing the two forms.*

Professor McFadyean regarded this as far from proved. There are very great differences in the virulence of bacilli found in animals, and it appears quite possible that bovine bacilli may be weakened or altered by passage through man.

(3) *Tubercular meat and milk can only infect mankind through the intestines; and, having regard to the abundant opportunities for infection in this way, primary intestinal tuberculosis ought to be of common occurrence, which is not the case. Therefore, says Koch, the human subject must be practically immune against bovine bacilli.*

McFadyean pointed out that Koch's German statistics are not in accord with those of this country. Instead of consumption of the bowels being a rarity, the records of the Hospital for Sick Children (Great Ormond Street, London) show that 29·1 per cent. of the cases of tuberculosis were primarily intestinal; while a very similar result (28·1 per cent.) has been experienced at the Edinburgh Royal Hospital for sick children.

Reference was also made to the increasing proportion of infantile deaths from consumption of the bowels, and to the arguments which led the late Sir R. Thorne Thorne to lay the blame upon tuberculous milk. It has to be admitted, however, that no statistics are available to indicate the extent to which human beings are affected by milk. But it cannot be denied that a large number of milch cows (not less than two per cent.) have tuberculous udders, and are actually supplying milk containing bacilli, while 30 per cent. of the animals are affected with tuberculosis in other parts. Moreover, much of the milk now on sale contains a considerable quantity of dust and dirt, most of which comes from the dirty udder, the hands of the milker, and the dust from the air of the

cowshed. Having regard to the great prevalence of tuberculosis amongst cattle, the dirt and the atmosphere of the byres must contain tubercle bacilli and some of these cannot fail to find their way into the milk.

After dealing with the means of prevention (see later), Professor McFadyean concluded by urging that "we ought not to concede to the "milkman the right to sell us tubercle bacilli, even if we were assured "that, like Dr. Koch's experimental pigs, we had nothing to fear beyond "the development of 'little nodules here and there in the lymphatic "glands' and 'a few grey tubercles' in the lungs."

Another able paper, contributed from Pennsylvania, agreed with Koch on the differences of bovine and human tubercle bacilli in some features, but drew attention to the similar effect of tuberculous material, whether from cattle or man, when inoculated in certain animals. The paper ended with an assumption from the evidence at hand that the bovine tubercle bacilli has a high degree of disease producing power for mankind, which is especially manifest in the early years of life. If it is ever possible to inoculate the human subject with tuberculosis from a bovine source (as was admitted by Koch), then why should not the transmission frequently take place under some favorable circumstances?

On the whole, there seemed to be a very general feeling amongst those present that further proof of a decisive kind must be forthcoming before Dr. Koch's conclusions on this head are allowed to seriously modify our action against the spread of tuberculosis.

It is worthy of note here that, since the pronouncement by Koch, Professor Delépine has been experimenting with the sole object of determining whether cattle might contract active tuberculosis after being injected with tuberculous products of human origin. He used four calves. "Of these two contracted tuberculosis from human tuberculous sputa." This result supports the experiments of Villemin in 1865, Chaveau in 1868, Martin, Woodhead, and others, in recent years.

Infection in the Home.

Apart from the foregoing discussion on the infective nature of tuberculous milk and meat, the important subject of the influence of housing and aggregation was considered. The papers uniformly accentuated the vast importance of this subject, for it is not poverty *per se* that favours tuberculosis, but the bad domestic conditions under which the poor have to live.

A highly interesting paper was contributed from Manchester as to the presence of infective material in dwellings occupied by consumptive persons. The investigations had consisted of bacteriological examinations of dust collected in houses of three types:—

(1) Dirty houses in which a consumptive patient is living who takes no precautions to dispose of his expectoration, but spits freely upon the floor and into his pocket handkerchief. In 66·6 per cent. of these houses

virulent tubercle bacilli were found showing the large amount of dangerous infective material present in an infected house.

(2) Clean houses in which a patient is living who is not sufficiently careful as to the disposal of his sputa. In 50 per cent. of these instances the bacillus was found. It is evident that ordinary household cleanliness alone is insufficent to prevent the accumulation of infective material in rooms occupied by a consumptive.

(3) Very dirty houses in which there had been no case of consumption for some years. In this class of house no tubercle bacilli were present, showing that virulent dust found in Class 1 and 2 must have been due to the presence of the consumptive patient.

It was ascertained that the dust nearer the floor than the ceiling possessed the greatest virulency. It was also shown that the infective dust was most virulent in cases where the access of sunlight and free circulation of air was prevented, while, conversely, the beneficial effect of light and air was demonstrated even in the dirtiest houses. Instances were given of the dangers attaching to infected rooms and the risk to healthy occupants and their successors. Koch asserted that "it is the overcrowded dwellings of "the poor that we have to regard as the real breeding places of tuberculosis." Gratifying accounts were given of the increasing attention which is being generally directed to the bettering of these conditions.

Professor P. Brouardel claimed that intemperance was one of the most important factors in propagating tuberculosis, and that any measures for limiting the ravages of alcoholism would be most valuable auxiliaries in the combating of tuberculosis.

PART II.—REMEDIAL MEASURES.

In the preceding portion of this report, reference has only been made to the discussion as to the prevalence of tuberculosis and the channels by which its spread is assisted, *e.g.*, by improper disposal of infected sputum, by meat and milk, by home and workshop conditions, by direct infection, by intemperance, etc.

A most valuable part of the work of the Congress, however, was directed to the discussion of the various remedial measures which are available. They may be divided into two classes, as follows:—(*a*) Preventive or prophylactic, (*b*) Restrictive or curative. The former division would include (1) the education of the public as to the real nature of tuberculosis and the personal measures of protection which lie in the power of the individual; (2) Abolition of the domestic conditions of overcrowding, etc., and improvement of the houses of the working classes; (3) Prevention of the sale of tuberculous meat and milk. The reasonableness of such preventive measures being adopted appears so obvious that they may be passed over for the present to admit of immediate discussion of the restrictive measures which are necessary. One word in passing may, however, be said as to the value of respiratory exercises for the development of the lungs. This important feature was advocated in several

papers. Under the head of restrictive measures would come (1) Notification of human tuberculosis; (2) Proper collection and destruction of infected sputum; (3) Disinfection of premises and clothing; (4) Dispensaries and Sanatoria for the proper treatment of early cases and homes for the isolation of advanced cases.

We have seen that without the bacillus there is no disease. It constitutes the whole danger and is found chiefly in the sputum of those already suffering. Expectoration therefore is not only dangerous but it is a disgusting habit "responsible for the untold misery of countless millions." In America and Australia spitting on the streets is punishable by a fine, and even arrest of the offender. In France and in this country placards are occasionally posted asking for the co-operation of the public in minimising this source of infection. Were protection from this danger secured it is reasonable to anticipate that tuberculosis would become as rare as leprosy, and more completely under control than small pox. When so much importance is ascribed to the sputum as a disseminator of the disease it is surely time the legislature took vigorous measures for its harmless disposal. If collected in a spittoon and destroyed, then there is no danger. If emitted on the ground, it dries, and is carried to its victims by the winds. If it remains in damp, ill-lighted, badly ventilated dwellings in town or country it retains its activity for harm for a long period. Even the indiscriminate distribution of any sputum should no longer be tolerated. What a democracy in the New World may do, when backed by public opinion, in the matter of interference with the liberty of the subject, without danger to the Government, surely the older states of Europe, aided by emperors, kings, and hereditary legislators, ought to be able to accomplish.

Notification of Tuberculosis in the human subject, both voluntary and compulsory, was freely discussed. Papers were read showing the valuable results which have been arrived at by systems of voluntary notification which have been established in several towns in this country, while reference was made to foreign States where notification is compulsory by law. In Norway, such a law recently came into operation compelling notification to the local medical officer of (*a*) new cases of phthisis coming under medical treatment; (*b*) Deaths from phthisis; (*c*) Changes of residence of persons suffering (if so required by the local authority). Such notification gives a medical officer of health many opportunities for good work, *e.g.*, (1) To see that there is cleanliness in the house, and proper treatment of the secretions; (2) To advise precautionary measures to be taken by those not infected; (3) To provide for the disinfection of rooms and clothing; (4) To investigate the source of infection and attack it there; (5) To secure the remedying of sanitary defects and improper conditions of housing; (6) To maintain a supervision over centres of infection; (7) To make enquiries and collect information for administrative purposes.

The value of notification and of the action taken upon it will be at once recognised, when it is remembered that a dwelling once contaminated by the disease may, if not disinfected or cleansed, give consumption to family after family inhabiting it.

It is worthy of record here that during the Congress there was no opposition to the desirability of the principle of notification. In fact, a unanimous resolution was passed in favour of notification, though the method of its application might have caused controversy.

Disinfection of houses should, as far as possible, be supervised by the Sanitary Staff. In Manchester, the methods of disinfection employed have been to disinfect articles of clothing by steam, while rooms have been disinfected by washing the floors, woodwork, etc., with soft soap and water, cleansing the walls down with dough (Esmarch's method) and limewashing the ceiling.

If, however, the house is dirty, or the patient has not carried out careful personal precautions, or marks of sputum are visible on the floor or walls, the surfaces of the room are washed with a solution of chlorinated lime, 1½ oz. to the gallon. It should be explained that milk of lime is used on the walls instead of the solution of chlorinated lime when rooms occupied by consumptives are disinfected.

Some sceptical minds may be inclined to criticise many of the opinions and measures recommended as the outcome of fads. Read what was done in Naples over one hundred years ago. The Neapolitan decree of 1782 contained seven propositions, in substance as follows :—

1. When the physician had established that there was ulceration of the lung, he was to report the patient, under penalty of 300 ducats for the first offence, and banishment for ten years for the second offence.

2. The authorities were to make an inventory of the clothing found in the patient's room, which was to be identified after death. Any opposition meant three years in the galleys or prison, if the offender was poor; three years in the castle and 300 ducats if he belonged to the nobility.

3. Household goods not susceptible to contagion were to be immediately cleansed; those susceptible were to be at once burned and destroyed.

4. The authorities themselves were to tear out and re-plaster the house, alter it from cellar to garret, carry away and burn the doors and wooden windows and put in new ones.

5. The sick poor were to be at once removed to the hospital.

6. Newly built houses could not be inhabited for one year from their completion, and six months after plastering had been finished.

7. Superintendents of hospitals were required to keep in separate places clothing and bedding for the use of consumptives.

Other severe penalties were threatened to those who bought or sold objects which had been used by consumptives.

Treatment of those suffering.

In considering the provisions to be made for the treatment of consumptives, the Congress was immediately faced with some difficulties, but not of a serious character. The disease is long and tedious, so that it is necessary to deal with three classes of patients.

(1) Those who with medical assistance can continue to work.

(2) Those unable to work, and still curable.

(3) Those past work, and past cure.

For the first class it was suggested at the Congress that in every manufacturing town there should be established anti-tubercular dispensaries for the home assistance of indigent workers suffering from incipient tuberculosis. Having regard to the large number of tuberculous patients it will probably never be possible to guarantee to each of them a sojourn of three of four months in a sanatorium. These dispensaries might form a special department of existing hospitals. The patients would be specially instructed to take all precautionary measures in the schools, the workshops, and in their homes. They would also act as valuable adjuncts to work in sanatoria. From them cases might be selected most suited to profit by the open air treatment. Again, after the departure of the patient, ameliorated or cured, from the Sanatorium, it would be necessary to supervise him and to continue his education in healthy habits. Not only would dispensaries precede and complete sanatoria work in affording free consultations and advice, but in distributing free among the sufferers spittoons and antiseptics, and where private or public benevolence provided, gifts of food, meat and milk. Therefore from a preventative point of view they might be found more efficacious even than Sanitoria.

The relative value of dispensaries and sanatoria was discussed. It was held that sanatoria are exceedingly costly, and they can only deal with an insignificant portion of the population. At the anti-tubercular dispensary in the Rue St. Lazare, the yearly average of examinations, consultations, and special instructions reaches 4,500 and in addition 450 courses of three months dispensary treatment are undertaken. The expenditure of the dispensary amounts to £1,250 a year, equal to a cost of 1s. 9d. per day per patient. The expense of starting the dispensary amounted to about £200. On the other hand the sanatorium containing 100 beds, and treating 400 patients, in periods of three months, cost £12,500 to build, and nearly the same amount yearly to keep up, that is about 6s. 8d. per day per bed. This comparison does not imply that sanatoria should in consequence be abandoned, but that they should supplement the dispensaries by recovering patients chosen from those applying at the dispensary.

There is no special value in the sanatorium which is unobtainable elsewhere, provided that the same authority and similar conditions can be exacted as in such an Institution. The house must be in a dry and healthy position, free from carpets, curtains, and dust. The cooking and dieting must be supervised, and the suggestions of kind friends unheeded. Even when all these things are attended to, the patient will miss the

hopefulness which comes from association with companions who are daily improving and full of confidence. "Hope," said Voltaire, "is half the recovery." In the sanatorium the patient can, if desirable, enter into the social life of the establishment, which should be less monotonous and wearisome than in a smaller house.

For the efficient treatment of the majority of the cases however it is not sufficient to use any ordinary house, but we require abundance of light and air. This is secured in a sanatorium by having windows from the ceiling to the ground, through which the patients' beds can be moved on the adjacent balconies or terraces; the patients who cannot walk must lie there from morning to night, and even during the night in fairly good weather and with proper shelter. The rooms for meals and games must be airy.

The establishment of sanatoria was treated in several ways, and the Congress was unanimous on the advantages of such institutions, although Dr. Koch deemed it necessary to sound a warning against over-estimating their importance, and asserted that even if the number of sanatoria be greatly increased their total effect will always remain but moderate. In looking up the history of the open air treatment it is gratifying to find that the first step was taken by an Englishman, Dr. Bodington, of Sutton Coldfield, in 1840. But the honour of systematising the so called open-air treatment must be given to the Sanatorium in Goobersdorf, which was opened in 1859. Then followed the Falkenstein Sanatorium in 1874, and Nordrach in 1888. These well known institutions have established a high reputation. Then legislation followed; the Act for the insurance of sick and invalided workmen of 1899, compels every workman and every workwoman from the age of sixteen who earns not more than £100 in the year to insure with the State. Something like fifteen millions of the fifty-three million inhabitants of the German Empire are at present insured against sickness and old age, against incapacity to earn a living, and if we add to them another twenty millions of relatives dependent on them, we find that in round figures about thirty-five millions derive support from the benefit of this law. The law further empowers the authorities to institute the treatment in case the *capacity* of an ensured to earn his living should be threatened by disease which might be cured. This led to the action of the State Insurance Institute in erecting sanatoria for the treatment of the insured.

In consequence of this movement, which has resulted in the erection of some forty-five sanatoria, it will soon be possible to treat yearly 20,000 patients in Germany, each for about three months. The greater part of the patients go home cured, or much improved, after having gone through a simple course of hygiene, and it may be safely assumed that the man or woman so cured will spread the knowledge acquired, enjoin its benefits at home, and in turn will become a means of instructing others who are so unfortunate as to acquire the disease; and even when the disease still lingers, they cease to be disseminators of tubercle bacilli, because they have been taught to render their sputum harmless.

Open-air treatment is beyond the experimental stage, but until we have succeeded in rendering the towns healthy, in overcoming intemperance, in educating public opinion, and in a good deal more besides, there will always remain poor tuberculous patients who should be isolated and cared for, to prevent them from becoming a source of danger. Information was given relating to 716 patients treated in various sanatoria in England. Of these 92 per cent. of all the patients so far responded to treatment as to gain weight. The average gain of weight was 14½ lbs. It was also stated that the amount of weight gained clearly does not depend on the mere quantity of food ingested. Quiescence of the disease or relative recovery was obtained in 37·4 per cent. of the patients. Amelioration occurred in 40·2 per cent. There was no amelioration in the remaining 22·3 per cent. The opinion has been expressed that women benefit less from sanatorium treatment than men, but this is not borne out by recent figures. Of 112 patients treated in the Pasteur Hospital, Havre, 18 per cent. were much improved, 35 improved, 23 stationary, 10 became worse, and 14 died. In the Hansesludle in Germany, 60 per cent. recovered, 15 were unable to return to work, and 25 per cent. died. In the Manchester hospital for consumption during the three years 1898-1900, there were 74 per cent. improved, 16·5 remained stationary, and 12·8 per cent. became worse. The figures are interesting and serve to caution us against entertaining exaggerated ideas. Though the most hopeful results have been recorded, still the treatment in sanatoria is not a panacea.

Now there are sanatoria in nearly every part of Germany, due largely to the action of insurance companies under Government control who find it economical to erect these institutions for the treatment of their consumptive clients. In England, many sanatoria have recently been built for paying patients, but as regards the poorer classes we are certainly behind the Germans and Americans. It has been computed that at present only one bed has been provided for every 200 consumptive patients who might be expected to ask for and require hospital relief. In Germany an attempt has been made to help those sufferers who cannot be admitted in sanatoria by providing "Erholungsstatte" in the neighbourhood of large cities, *e.g.*, Berlin. The patients travel there in the morning and return to their own homes at night. Several large manufacturers are doing likewise for their own workmen.

The interest of Friendly Societies and Trade Unions in England was considered, and an attempt was made by figures to show that the liability of the members to phthisis is not so great as that of the general population. The conclusion arrived at in the paper was that the financial interest of these Societies is too small to allow of its being reduced into practice to any material extent. The Prudential Insurance Company of America have carefully considered the question with this result: "that it would be both "financially impossible as it would be otherwise inexpedient on the part of "Industrial Companies to contribute to the erection and maintenance of "sanatoria."

Sanatorial treatment to be of the highest value should be begun early. Many cases do not come to the sanatoria until the disease is well advanced, and the reasons for this have been classified as follows :—

(*A*) *Patients themselves chiefly responsible.* (1) Long delay in taking medical advice, in the hope of throwing off the cold, etc. (2) Refusal to follow good advice, though quite able to do so, till frightened by onset of serious symptoms. (3) Delay in following good advice, on the grounds of expense ; the sacrifice eventually being made when the chances of cure are considerably poorer.

(*B*) *Medical Men chiefly responsible.* (1) True nature of disease not being diagnosed till it is far advanced. Such cases have usually been treated—often for a considerable time—for Muscular Rheumatism, Anæmia, Debility, Chills or Influenza, etc. (2) Disease being diagnosed, but its nature concealed from the patient, who is informed that he has not got consumption, but a little Catarrh of the Lung, Weak Lung, Tendency to Consumption, a Lung touched, or some such indefinite condition. (3) Disease being diagnosed, but apparently on the assumption that it is inevitably fatal, nothing but merely symptomatic treatment being adopted, until on the suggestion of friends or relatives the Sanatorium treatment has been decided on as a last hope. (4) Disease being diagnosed, and, in many cases, at the request of patients or their families, Sanatorium treatment at home having been tried without success.

Once upon a time it was held "that outside of climate treatment there was little hope for the consumptives." Fortunately this doctrine, so inhibitive of progress, is gradually giving way to a more encouraging one, which proclaims the curability of tuberculosis in any climate. Most excellent results have been recorded at Rossclare, in County Fermanagh, Ireland, and this during a cold, wet summer, and an abnormally wet and stormy winter.

Open air treatment in sanatoria simply re-equips the "vis medicatrix Naturæ," and places it on demonstrable fact. Unjustifiable objections are sometimes raised, *e.g.*,

(1) That sanatoria treatment is a new fad.

(2) Not on the lines of humanity.

(3) Tuberculosis cannot be placed in the same category as the acute infectious diseases.

(4) Unwillingness of patients to undergo treatment.

(5) Curative results are limited, and costly.

(6) Sterilizing the sputum renders patient perfectly harmless.

(7) Money would be better spent by improving sanitary conditions.

(8) Better to fortify the weak by improving their health in convalescent homes.

(9) Concentration of infection is dangerous.

(10) Sanatoria should only be erected in favoured climes and altitudes.

In addition to Dispensaries and Sanatoria, the provision of homes for advanced consumptives, who, from poverty, would be a danger to the community, was also advocated. This, of course, is of importance from the point of view of prophylaxis. There is no reason why these three departments should not work in mutual association, if not under one management.

Other Measures.

The wisdom of palliative measures as compared with the eradication of tubercle in the cow proved the subject of an interesting paper. It was pointed out that the terms "Sterilisation" and "Pasteurisation" have practically the same significance, viz., raising the temperature of the milk to a degree which is capable of destroying the tubercle bacillus; exposure to a temperature of 170° to 180° Fahr. for about twenty minutes to half an hour is sufficient to destroy most pathogenic organisms. However, sterilisation and pasteurisation of milk possess one conspicuous advantage, viz., that the application of the safeguard is within the reach of every reasonably prudent and careful household, consequently for ease of application it is beyond any comparison with the other preventive measures to be considered.

There is no clinical evidence whatever to show that sterilized or even boiled milk is less nutritious and valuable than raw milk. On the other hand, cows' milk raw, in addition to the risk of tuberculosis, brings many others. The process of milking may involve dirt from a dirty milker, from dirty udders into a dirty milk pail. From this it may be passed through a dirty strainer into a dirty railway-can. It is discharged from the railway-can into smaller vessels in which it is hawked about the dusty streets, passing through some half dozen other pots and pans before it reaches the nursery or the table of the consumer, involving a host of possible sources of contamination, not excepting the contamination of tubercle bacillus; in fact, it may be safely said there is no article of food in common use so constantly exposed to contamination or so susceptible of contamination as raw milk. The milk, on the other hand, as Nature intended it to be given, is never once exposed to the air, passing directly and at the time of its manufacture in the gland to the stomach of the young animal, and, apart from the possibility of disease in the gland, is bacteriologically clean and pure.

Sterilisation is after all only an expedient, and must not be put into so much prominence that the importance of the other safeguard is lost sight of. Beyond any question the ultimate advantage lies in obtaining the milk from herds free from tuberculosis. It is in fact comparable with the advantage of obtaining drinking water from a pure source instead of taking it from a contaminated one and relying upon purification afterwards.

Legislation.

Several papers were read on the so-called "Model Milk Clauses" and as was anticipated, difficulties in their administration were described. One paper writes to the effect "if it is difficult to deal with and supervise the supply within our own city it is evidently both costly and difficult to maintain a staff to inspect the cowsheds in the country outside the city." What is there to prevent a dairyman from sending his milk for sale and consumption to a district where no Act of Parliament exists to enable the community to protect itself, or from selling his diseased cows to a dairyman in another locality. "This is not the way to secure a supply of milk from herds free from tuberculosis" says the writer. If the milk clauses had recognised and invited the co-operation of the Sanitary Authority in which the offending dairy was situate some of the difficulties would have been minimised if not entirely overcome.

With regard to legislation it was considered necessary:—(1) To endow sanitary authorities and county councils with full rights of inspection of all sources of their milk supplies. (2) To amend the Dairies, Cowsheds, and Milkshops Orders as above indicated. (3) To provide for gratuitous testing of herds with tuberculin. (4) To apply to country generally the Tuberculosis Clauses of 1899 *plus* powers to apply the tuberculin test and to prohibit removal of suspected animals. (5) For compulsory slaughter of all reacting milch cows, with partial compensation unless the disease be generalised. (6) For penalising the fraudulent fortifying of animals against the reaction of the test. (7) For protection of veterinary and health officers from personal liability. (8) Some satisfactory cubic space requirements for country cowsheds. (9) Periodic veterinary inspection of milch cows.

To minimize the sale of diseased meat, it was proposed that as far as possible all animals should be slaughtered in public slaughter houses. In Belgium, Southern and Central Germany, in Brunswick and Saxony, meat inspection before sale is compulsory. In Sweden and Norway communal slaughter houses are required, and meat inspection in towns. In New Zealand every town of more than 2,000 inhabitants is now compelled to erect its own public abattoir and to appoint a meat inspector.

Tuberculin.

Several papers were read on the diagnostic value of tuberculin in human tuberculosis. Whatever helps to bring the patients as early as possible under proper treatment must be valuable. This is the case of tuberculin. In suitable cases its use is perfectly safe as a diagnostic. As a therapeutic agent experience amongst observers varies.

Its use was advocated in controlling milk supplies, as it produces unfailingly in tuberculous animals a febrile reaction of a distinct type, and without any danger. One speaker emphasized the fact that a willing faith, an intelligent belief in the reliability of the test, and in the contagious nature of the disease on the part of the owner are very important factors in its application, and in the ridding of a herd of this terrible scourge. Of course occasional doubtful reactions will occur, but on retesting a month later most of these will give some distinct indication.

When every precaution is taken and the test carefully applied, at least 98 per cent. of the results will be correct and definite. It is almost as was stated in the summing up of a report by the Veterinary Inspector to the Board of Public Health of Victoria two years ago. After testing 297 dairy cows he said: "When tuberculin indicated that tuberculosis was present, tuberculosis was found; and when tuberculin indicated that tuberculosis was not present, tuberculosis was not found." None of our methods are so perfect but that they are capable of improvement.

Resolutions Adopted.

The concluding general meeting of the Congress was held on July 27th, presided over by Earl Derby, and attended by an enthusiastic throng of distinguished scientists and public workers from all parts. The following resolutions were unanimously carried:—

1. That tuberculous sputum is the main agent for the conveyance of the virus of tuberculosis from man to man, and that indiscriminate spitting should therefore be suppressed.

2. That it is the opinion of this Congress that all public hospitals and dispensaries should present every patient suffering from phthisis with a leaflet containing instructions with regard to the prevention of consumption, and should supply and insist on the proper use of a pocket spittoon.

3. That the voluntary notification of cases of phthisis attended with tuberculous expectoration, and the increased preventive action which it has rendered practicable, has been attended by a promising measure of success, and that the extension of notification should be encouraged in all districts in which efficient sanitary administration renders it possible to adopt the consequential measures.

4. That the provision of sanatoria is an indispensable part of the measures necessary for the diminution of tuberculosis.

5. That in the opinion of this Congress and in the light of the work that has been presented at its sittings, medical officers of health should continue to use all the powers at their disposal, and relax no effort to prevent the spread of tuberculosis by milk and meat.

6. That, in view of the doubts thrown on the identity of human and bovine tuberculosis, it is expedient that the Government be approached and requested to institute an immediate inquiry into this question, which is of vital importance to the public health and of great consequence to the agricultural industry.*

7. That the educational work of the great national societies for the prevention of tuberculosis is deserving of every encouragement and support. It is through their agency that a rational public opinion may be

* A Royal Commission has since been appointed by His Majesty to undertake this Inquiry.

formed, the duties of public health officers made easier of performance, and such local and State legislation as may be requisite called into existence.

8. That this Congress is of opinion that a permanent international committee should be appointed—(*a*) to collect evidence and report on the measures that have been adopted for the prevention of tuberculosis in different countries; (*b*) to publish a popular statement of these measures; (*c*) to keep and publish periodically a record of scientific research in relation to tuberculosis; (*d*) to consider and recommend measures of prevention. This Congress is further of opinion that all international and great national societies whose object is the prevention of tuberculosis should be invited to co-operate.

9. That in the opinion of this Congress, overcrowding, defective ventilation, damp and general insanitary conditions in the houses of the working classes diminish the chance of curing consumption and aid in predisposing to and spreading the disease.

10. That the following question be submitted for the consideration of the next congress on tuberculosis:—The constitutional conditions of the individual which predispose to tuberculosis, and the means by which they may be modified.

11. That, while recognising the great importance of sanatoria in combating tuberculosis in all countries, the attention of Government should be directed to informing charitable and philanthropic individuals and societies of the necessity for anti-tubercular dispensaries as the best means of checking tubercular disease among the industrial and indigent classes.

Conclusion.

Public opinion, it has been said, sets the pace of progress. Such a doctrine is eminently applicable to this important subject. Ignorance of the laity and scepticism amongst cattle owners and breeders as to the spread of contagion form great obstacles in the restriction and prevention of this fell disease in its various forms. Public recognition of its dangers, and public conviction of the benefits of prevention will render easier the enforcement of any measures which interfere with daily life and disturb old habits. Education, therefore, is indispensable not only for the advancement of popular knowledge, but for the pushing forward of legislation, and the fulfilment of legal obligations when necessary. One of the grand factors in assisting these objects is by means of congresses, associations, societies, and by providing, in a crusade like this, educational institutions like sanatoria and dispensaries. The great significance of this Tuberculosis Congress does not rest alone in the fact that carefully prepared and able papers have been read, that instructive debates followed, or that conclusions and resolutions arrived at have had all the authority which such an assemby can give to them. It consists rather, as experience has taught us, that a popular interest, intelligent and

active, can be created. Further, the workers and those present form that valuable acquaintance with their fellows which must lead to mutual confidence, so efficacious in the successful working of the various public and private sanitary organizations throughout the country. Such work betokens a most healthy condition of activity in directions where benefit to the community is almost certain to be found.

In conclusion, the educational work of Congresses and societies for the prevention of tuberculosis, is deserving of every encouragement and support. It is through their agency that a rational public opinion may be formed, the duties of public health officers made easier of performance, and such local and state legislation as may be requisite called into existence. As has been well said, public opinion is the breeze which fills the sails of the ship of Government. It is the duty of all to fan that breeze.

JAMES ROBT. KAYE.

County Hall,
Wakefield,
October, 1901