EDUCATION OF THE PUBLIC.

A further measure, already recognised on all hands as effective, is the instructing of all classes of the people as to the infectiousness of tuberculosis, and as to the best way of protecting oneself. The fact that tuberculosis has considerably diminished in almost all civilised States of late is attributable solely to the circumstance that knowledge of the contagious character of tuberculosis has been more and more widely disseminated, and that caution in intercourse with consumptives has increased more and more in consequence. If better knowledge of the nature of tuberculosis has alone sufficed to prevent a large number of cases, this must serve us as a significant admonition to make the greatest possible use of this means, and to do more and more to bring it about that everybody may know the dangers that threaten him in intercourse with consumptives. It is only to be desired that the instructions may be made shorter and more precise than they generally are, and that special emphasis be laid on the avoidance of the worst danger of infection, which is the use of bedrooms and small ill-ventilated workrooms simultaneously with consumptives. Of course the instructions must include directions as to what consumptives have to do when they cough and how they are to treat their sputum.

SANATORIA.

Another measure which has come into the foreground of late, and which at this moment plays to a certain extent a paramount part in all efforts for the combating of tuberculosis, works in quite another direction. I mean the founding of sanatoria for consumptives.

That tuberculosis is curable in its early stages must be regarded as an undisputed fact. The idea of curing as many tuberculous patients as possible in order to reduce the number of those that reach the infectious stage of consumption, and thus to reduce the number of fresh cases, was therefore a very natural one. The only question is whether the number of persons cured in this way will be great enough to exercise an appreciable influence on the retrogression of tuberculosis. I will try to answer this question in the light of the figures at my disposal.

According to the business report of the German Central Committee for the Establishment of Sanatoria for the Cure of Consumptives, about 5,500 beds will be at the disposal of these institutions by the end of 1901, and then, if we assume that the average stay of each patient will be three months, it will be possible to treat at least 20,000 patients every year. From the reports hitherto issued as to the results that have been achieved in the establishments we learn further that about 20 per cent. of the patients that have tubercle bacilli in their sputum lose them by the treatment there. This is the only sure test of success, especially as regards prophylaxis. If we make this the basis of our estimates, we find that 4,000 consumptives will leave these establishments annually as cured. But, according to the statistics ascertained by the German Imperial Office of Health, there are 226,000 persons in Germany over 15 years of age who are so far gone in consumption that hospital treatment is necessary for them. Compared with this great number of consumptives, the success of the establishments in question seems so small that a material influence on the retrogression of tuberculosis in general is not yet to be expected of them. But pray do not imagine that I wish, by this calculation of mine, to oppose the movement for the establishment of such sanatoria in any way. I only wish to warn against the over-estimating of their importance which has recently been observable in various quarters, based apparently on the opinion that the war against tuberculosis can be waged by means of sanatoria alone, and that other measures are of subordinate value. In reality the contrary is the case. What is to be achieved by the general prophylaxis resulting from recognition of the danger of infection and the consequent greater caution in intercourse with consumptives is shown by a calculation of Cornet's regarding the decrease of mortality from tuberculosis in Prussia in the years 1889 to 1897. Before 1889 the average was 31.4 per 10,000, whereas in the period named it sank to 21.8, which means that, in that short space of time, the number of deaths from tuberculosis was 184,000 less than was to be expected from the average of the preceding years. In New York, under the influence of the general sanitary measures directed in a simply exemplary manner by Biggs,

the mortality from tuberculosis has diminished by more than 35 per cent. since 1886; and it must be remembered that both in Prussia and New York the progress indicated by these figures is due to the first beginnings of these measures. Considerably greater success is to be expected of their further development. Biggs hopes to have got so far in five years that in the city of New York alone the annual number of deaths from tuberculosis will be 3,000 less than formerly. I take this opportunity of most urgently recommending Dr. Biggs's organisation to the study and imitation of all municipal sanitary authorities.

Now, I do indeed believe that it will be possible to render the sanatoria considerably more efficient. If strict care be taken that only patients be admitted for whom the treatment of those establishments is well adapted, and if the duration of the treatment be prolonged, it will certainly be possible to cure 50 per cent., and perhaps still more. But even then, and even if the number of the sanatoria be greatly increased, the total effect will always remain but moderate. The sanatoria will never render the other measures I have mentioned superfluous. If their number become great however, and if they perform their functions properly, they may materially aid the strictly sanitary measures in the conflict with tuberculosis.

CONCLUSION.

If now, in conclusion, we glance back once more to what has been done hitherto for the combating of tuberculosis, and forward to what has still to be done, we are at liberty to declare with a certain satisfaction that very promising beginnings have already been made. Among these I reckon the consumption hospitals of England, the legal regulations regarding notification in Norway and Saxony, the organisation created by Biggs in New York, the sanatoria, and the instruction of the people. All that is necessary is to go on developing these beginnings, to test, and if possible to increase, their influence on the diminution of tuberculosis, and, wherever nothing has yet been done, to do likewise.

If we are continually guided in this enterprise by the spirit of genuine preventive medical science, if we utilise the experience gained in conflict with other pestilences, and aim, with clear recognition of the purpose and resolute avoidance of wrong roads, at striking the evil at its root, then the battle against tuberculosis, which has been so energetically begun, cannot fail to have a victorious issue.

AN ADDRESS

ON

THE MEASURES ADOPTED BY DIFFERENT
NATIONS FOR THE PREVENTION OF
CONSUMPTION.

By PROFESSOR P. BROUARDEL,

Dean of the Faculty of Medicine of Paris; Member of the Institute.

MORTALITY from tuberculosis varies according to the country. In some cases it is accountable for a sixth, a fifth, and sometimes a fourth of the total mortality. Havoc such as this makes it compulsory that all nations and governments should strictly inquire into and adopt measures to arrest the propagation of a disease which in these days is the greatest enemy of the human race. The wonder is that the voice of alarm has been so long in making itself heard, and that for centuries our ancestors have looked impassively on the disasters going on around them. There were several reasons for this apparent indifference. The struggle was considered useless, the disease incurable; it was not known how it spread. Exaggerating the import of some observations, it was agreed that phthisis was hereditary. They were lulled to sleep by this formula, which served as a pillow for idleness, and exempted them from investigating the origin of the mischief. Popular observations were looked on as old wives' tales—for example, Morgagni's, who, in the seventeenth century, stated that in Italy it was customary to burn the bedding of persons who had died from phthisis, and who declared that he feared to make a *post-mortem* examination of cases of phthisis. But when, on December 15th, 1865,

Villemin showed experiments at the Academy of Medicine which proved the real presence of the contagion, when our illustrious colleague, Professor Robert Koch, had discovered and demonstrated to the medical world the agent of this contagion, everyone felt that a new way was opened to humanity, and every nation wished to profit by the recent scientific discoveries for the public good.

Before the scientists I have just mentioned had actually made known their discoveries, you English people had already begun the struggle. Convinced by observation that tuberculosis thrived in dark and damp dwellings, in 1836—nearly 70 years ago—you passed a law providing for the construction of healthy houses. And since that date your zeal has not abated. You have, with admirable perseverance, passed more than ten Acts of Parliament, you have rendered salubrious the dwellings of the poor, the workshop, the town, and the whole kingdom. This effort has been described by the name of the Queen who presided over its direction—the Victorian Era. No greater homage could be paid to Her Gracious Majesty, and in the name of all my countrymen I unite with my English colleagues in adopting this characteristic name for the crusade that was undertaken and for the success obtained. You have diminished mortality in England from tuberculosis by 40 per cent. Yours is the honour. It will be ours to follow in your steps.

I was asked by the Committee to make the subject of my address the measures adopted by different nations for the prevention of consumption. This I agreed to do, but I must at the same time make a confession. I depended too much on my wish to please my excellent colleagues, whose request seemed so feasible: but, unfortunately, precise information is difficult to collect, and the time at my disposal for its verification was very short, so that there will, I fear, be lacunæ, probably even errors. I shall be pleased in either case to have my attention drawn to them, and I entreat my colleagues to do so; if they comply, thanks to them and to you, the wish expressed by the Committee will be carried out, and every nation may, by hearing what its neighbours have done, gain instruction and be inspired by motives of emulation beneficial to all.

The grounds for the prevention of tuberculosis are identical in every country. On this question the entire medical profession of the world is united. Tuberculosis is avoidable and curable. The methods used to bring this about are the same in all countries, but according to the impetus given to the movement by the scientists in the different nations, and according to the customs and laws in force, some nations have taken the first rank.

THE EDUCATION OF PUBLIC OPINION.

Allow me to dwell a moment on legislation. It is only possible to bring a law into force that interferes with our daily life, that disturbs inveterate habits, and that has to be carried out in the bosom of the domestic hearth, when it is called for by public opinion; when all are convinced of its benefits, and everyone recognises the danger of his vicious habits, and is ready personally to reform them and to require his neighbour to do the same. This is the state of things in England. M. d'Estournelles de Constant, Chargé d'Affaires for France in London, wrote in 1892 as follows:

English people leave no stone unturned to render not only their houses healthy, but their streets, districts, town, and whole country. Owners of property unite in preventing negligence detrimental to the community, which would in the first place expose its author and his neighbours to risk of illness and then to other material risks; for the rents are in direct proportion to the good reputation of the locality. Is the sanitation of such a town, neighbourhood, or house good? is the first question asked by an intending purchaser, householder, or lodger. Private individuals therefore are the promoters of sanitary measures which they consider appropriate: they decide on their adoption, and see that they are carried out. The State never interferes except in case of absolute necessity.

This system seems to me the only efficacious one, and the first thing which is indispensable is to educate public opinion. How is this antituberculous education of public opinion to be carried out? You founded in England, in 1899, under the presidency of His Royal Highness the Prince of Wales, a National Association for the Prevention of Consumption and other Forms of Tuberculosis. Its object is to carry out prevention by educating the masses. You drew up short, practical pamphlets. As a model, I may quote *The Crusade against Consumption* (48 pages, price 6d.), *Milk and Tuber-*

culosis, Fresh Air and Ventilation, How to Prevent Consumption, etc., and distributed them freely. At the head of this Association I find names that I recognise with respect; those of the gentlemen who inaugurated this Congress.

Germany founded societies for the construction of sanatoria, and then societies for the propagation of the idea, to popularise sanitary ideas. These societies are small and scattered in different localities, forming provincial groups. They, too, publish popular pamphlets. In Belgium there is a National League against tuberculosis, with its seat in Brussels. Each province has an independent branch. In Norway the Storting voted 40,000 crowns for the purpose of printing and distributing a popular work on tuberculosis, by Dr. Klaus Haussen, and 2,000 crowns to form a travelling fund for doctors wishing to gain information about the management of sanatoria. In France the Society for the Prevention of Tuberculosis by Popular Education, under the direction of Dr. Peyrot, has collected together those who can teach with authority. I refer to such men as Lavissee, Matignon, Victorien Sardou, Landouzy, etc.

Many of us have addressed meetings explaining rules of prophylaxis in the provinces, where, on every hand, antituberculous movements are springing up. I made use of my position as President of the Polytechnic Association to institute popular education in Paris. This year eighty-eight lectures on tuberculosis have been given to 12,000 pupils of this Association. Thus gradually in all countries the public are beginning to realise that personal care and cleanliness are necessary to obviate contagion, and are also realising that other idea, to my mind equally important, that a consumptive patient is only dangerous if the necessary precautions are not taken around him, and if he himself does not take them to protect his relatives, friends, and fellow-workmen from contagion.

THE DANGER OF SPITTING.

Tuberculophobia must not be produced, the patient must not be made a pariah. Long before our time a consumptive person has lived for many months without contaminating wife and children. The danger is in the sputum, which contains thousands of contagious germs. To expectorate on the ground is a disgusting and dangerous habit. Once this habit has quite disappeared tuberculosis will decrease rapidly. In America this habit is against the law, and there has been a press campaign against it. The American is a great newspaper reader, and he quickly realised the consequences of this deplorable habit. As an example may be quoted the case of a millionaire—Mr. Bradbury—who, punished for the first offence by a fine, on repeating it was sentenced to twenty-four hours' imprisonment. At Sydney a fine of £1 is imposed on persons for spitting in the streets. In Europe, though we are not so strict, we are none the less convinced of this danger. What part, as a matter of fact, does this sputum play in the subsequent propagation of the disease? It varies in different cases. Collected and shut up in a private or common but antiseptic spittoon, destroyed by incineration or some other measure, it is dangerous to no one. Thrown into dry and well-lighted surroundings, exposed to the rays of the sun, it will soon lose its dangerous properties; but if it remains in damp and dark surroundings it will maintain its activity for a long time. Thus it is that tuberculosis claims more victims from gloomy ill-ventilated dark dwellings.

THE IMPROVEMENT OF WORKMEN'S HOUSES.

All nations have recognised this, but England has the double merit of recognising the primary importance of this problem, and of having solved it successfully in a manner peculiarly her own. Recognising that insalubrious dwellings are one of the most potent agents in the propagation of tuberculosis, the Legislatures of the different countries have kept this cause of insalubrity well in view, and have made laws ordering the destruction of unhealthy dwellings. You, since 1836, have directed your legislation towards the construction of healthy abodes. In England, in 1836, legislation intervened in favour of associations for building workmen's dwellings. Building societies are savings banks to procure houses for their members, and have actually more than a million members belonging to them in the United Kingdom. The Labouring Classes' Lodging Houses Acts (1851, 1866, 1867) are a collection of laws urging parishes and corporations of more than 10,000

inhabitants to construct sanitary houses. The Acts for the Removal of Nuisances (1852, 1866, 1874) gave the local authorities the right to inspect working houses, and fix fines for contravention of laws and regulations. The Artisans Dwellings Acts (1868 to 1882), also called Torrens's Acts, have as their primary object the reparation and demolition of insalubrious houses; they also suppress obstructive buildings, such as take away light and air from other houses and prevent ventilation. The Artisans' and Labourers' Dwellings Improvement Acts (1875 to 1882) oblige municipalities to pull down unhealthy dwellings and to find a lodging for those persons who, in consequence of this, are rendered homeless. This action on the part of the Government has led to the intervention of benefactors whose memory should be kept green in the minds of those interested in public health. First, I will mention Peabody. From 1862 to his death in 1869, this generous man gave £500,000 for building houses to be let to poor workmen at a very low rate, but enough was to be charged to make the man feel independent of charity. As a result, 18,000 workmen are housed in these dwellings. Judging by the advance made to date, it may be prophesied that fifty years after their foundation 120,000 workmen will be benefited by these dwellings. I must also mention Miss Octavia Hill's work and the Artisans', Labourers', and General Dwellings Company, founded by workmen in 1867, and who now have more than 6,000 houses, etc. In Germany private initiative has not been so successful. Professor Brantano, of Strassburg, and M. Miquel, Minister of Finance for Prussia, think that State and parochial intervention is required to ameliorate the condition of workmen's dwellings, because they are powerful enough of themselves. Nevertheless, some building societies have been founded, notably the "Berliner Bangesossenschaft." Belgium has been one of the most enthusiastic nations in taking up the movement in favour of healthy dwellings. The law, passed in 1889, formed committees in each administrative district to build and let healthy houses to workmen. In Denmark building societies have flourished best of all. In 1600 Christian IV set the example by erecting houses with gardens for the employees of his house. Dr. Ulrich founded an Association which has as many as 20,000 members, and 900 real estates worth ten million francs. These houses compose the healthiest part of Copenhagen. It is not my business now to speak of what has been done in France—the law of 1850, dealing with unhealthy dwellings; Du Mesnil's work on lodging the poor in Paris; the law passed November 30th, 1894, which defines the powers of the State and of private initiative in the construction of working dwellings. One of the French delegates, the Prince d'Arenberg, will give precise information about this much more ably than I can.

All authors agree that mortality is lower in these healthy houses than in the town in which they are built. The healthy house therefore is antituberculous. But if tuberculous germs fall in an ill-lighted, damp house, they maintain their activity for a long time, whether the house is in town or country. In these surroundings population is often very dense. It is no uncommon thing to see one room in Paris occupied by five, six, eight, and sometimes twelve persons. They are continually coming in contact with one another, chances of contagion are increased by this fact alone, and in addition to the limited space the dirtiness of the occupants, or, as I should say, the impossibility of keeping them sufficiently clean has to be remembered. Thus small tuberculous foci are created which invade the whole house; the workmen and employees carry the germs of disease into their workshops and offices, and soon make a large tuberculous focus of the town. But I do not wish to mislead. A town is not *in toto* unhealthy, and does not form an irreducible block. I have shown elsewhere that, in the same town, quarters adjoining one another have a mortality from tuberculosis which varies to the extent of as much again, and that mortality from tuberculosis in districts in Paris varies from 10 to 100 per 10,000 inhabitants. However, in every quarter there are hotbeds of tuberculosis. These are what we have to find and demolish. Above all else, new ones equally unhealthy must not be formed, for they are a danger to a city and country. In most of the towns in all countries building plans of new houses have to be submitted for approval to the local sanitary authorities. It is a necessary precaution which cannot be too strictly enforced.

The evils of an unhealthy dwelling are not confined to the risk of contagion just referred to. The want of air and light acts on the nutrition of the inmates, children pine away, the strongest men cannot withstand it, every human being living in these places is the destined prey of infectious diseases; and, if we consider phthisis only, they become predisposing causes of consumption, transforming the strongest man, and putting him on a par with the condition of those born of tuberculous parents. In the latter heredity is not direct; one is not born tuberculous but predisposed to tuberculosis. The English, German, Italian, French, and other laws that I referred to a moment ago are therefore just, and should be enacted perseveringly, especially at a moment when there is a tendency in all countries to concentrate in the towns the greater part of our populations. By looking after the salubrity of the towns the health of the whole land is protected.

ALCOHOLISM AND TUBERCULOSIS.

Unhealthy dwellings cause other disasters. Dark and crowded as they are, cleanliness is difficult, if not impossible, to preserve; they are not pleasant to pass the time in, and the workman stays in his home as little as possible; he eats there and sleeps there, but the rest of his time is spent in the public-house. Sir John Simon was right in saying: "The wretched lodging is the purveyor of the public-house," and we can add to it that the public-house is the purveyor of tuberculosis. In fact, alcoholism is the most potent factor in propagating tuberculosis. The strongest man, who has once taken to drink, is powerless against it. Time is too short for me now to draw comparisons between the laws in force in different countries, those which are proposed, private efforts, associated efforts, and temperance societies. But I can say that a universal cry of despair rises from the whole universe at the sight of the disasters caused by alcoholism. I will quote but two sets of statistics but they speak for themselves. Tatham's show that the mean mortality being represented by 100, that caused by tuberculosis is in

Barmen	...	...	...	257	Sweeps	...	...	...	141
Pedlars	...	...	...	239	Publicans	...	...	...	140
Dock labourers	...	...	...	176	Coachmen	...	...	...	124
Strolling musicians	...	...	...	174	Coalmen	...	...	...	116
Hair dressers	...	...	...	149	Butchers	...	...	...	105
Brewers	...	...	...	146					

Baudran of Beauvais has shown that mortality from tuberculosis and from alcoholism are nearly identical. In this connection he obtained the following results:

Deaths from Tuberculosis in 10,000 Inhabitants.	Annual Consumption of Litres of Alcohol per Head.
30 to 40	12.47
40 to 50	15.21
50 to 60	14.72
70 to 80	16.36
80 to 90	17.16
More than 90	50.70

Any measures, State or individual, tending to limit the ravages of alcoholism will be our most precious auxiliaries in the crusade against tuberculosis, but the question is too large a one to deal with here. Still I should like to draw attention to a mistake made too easily in the different countries by Ministers who have the charge of the financial department of the State. They like to calculate the sum the State gets from the duty on alcohol, but they should deduct from it the cost to the community of the family of the ruined drunkard, his degenerate, infirm, scrofulous, and epileptic children, who must have shelter. This invasion of alcoholism ought to be regarded by everyone as a public danger, and this principle, the truth of which is incontestable, should be inculcated into the masses that the future of the world will be in the hands of the temperate.

TUBERCULOSIS IN WORKSHOPS AND PLACES OF PUBLIC ASSEMBLY.

The dangers surrounding a man in an unhealthy home are the same when for his work, his duties, his pleasure, through illness, or under constraint, a man lives all or part of the day in a centre where other people are assembled, where unhealthy conditions and overcrowding exist. If he is well his companions are dangerous to him, if he is ill he is dangerous to them. Now the conditions of modern life compel a man to live in such centres. As a child, there is the school; as an adult, the barracks; a workman, the workshop; a student, the lecture hall, the libraries, laboratories; the employee or

official, the bureau and the offices. If he moves about he uses vehicles, railway carriages, too often contaminated. At the hotel where he stops he has frequently been preceded by a sick person, and no precautions have been taken to protect the new arrival from possible contagion. If he is poor and ill he goes into a hospital, where he is surrounded by contamination on every hand. This peril from common life, inseparable from advance in civilisation, is continually growing; it is the ransom, and accounts for the threatening increase in tuberculosis.

PREVENTION OF TUBERCULOSIS IN CHILDHOOD.

Brought face to face with those predisposed by their family history, by the unhealthiness of their dwellings, it has been recognised as a duty in some countries to make an attempt to restore these tottering frames, and to render them capable of battling with the dangers that threaten them. It was adjudged with reason that childhood and youth would be the easiest period of life to influence. Thanks to the help of some towns, and of private initiative in Italy and France and in other countries, sanatoria by the seaside have been established for weakly and scrofulous children. There are 14 in France, which accommodate more than 2,000 children a year, and with excellent results. May I be allowed to recall the fact that we owe this success chiefly to the unfailing activity and to the propaganda undertaken by our revered master, Dr. Bergeron? Inspired by the same idea some countries have started holiday colonies, and temporary visits to places by the sea or in the mountains. Everything done in this direction will help to rescue from contagion those who, thanks to the generosity of private individuals, can profit by these health-restoring visits. In 1893, with the same object in view, Mme. Hervieu started at Sedan working gardens for children, young people, and their parents. These gardens occupy more than 2,000 square metres around the town, and accommodate 321 families, composed of 1,251 persons. The Society supplies tools, seeds, and manure to each family. In 1894 the Jesuit Father Volpette started the working gardens at St. Etienne. They cover about 42 acres, and accommodate 410 families, composed of 2,460 persons. On the ground let working houses are built. About ten have already been built by the lodgers. There are working gardens at Bercy, and some are now being made at Fontainebleau and at Villeurbanne, near Lyons.

TUBERCULOSIS AND MEAT.

Before touching on the question of the cure of tuberculosis I should like to say a few words about measures adopted to prevent tuberculous contagion by food. Since Chauveau showed that it was possible for tuberculous germs in food to produce tubercles in the intestinal tract, attention has been turned to precautions for preventing the consumption of meats and milk from tuberculous animals. As far as meat is concerned, surveillance of the slaughterhouses in large towns achieves this. In Belgium this measure is also made to apply to the country; but I do not know of any other kingdom where private slaughterhouses are inspected, and in them it is that phthical cows, measly pigs, and diseased animals of any kind are slaughtered, and are able to escape inspection. This injurious food is consumed either as fresh meat, or in the form of *pâtés* or sausages, from which the tuberculous viscera have not been removed. Another danger is the hawking of meat in pieces. It is rife especially in the large towns. Butchers receive daily quarters of meat despatched by provincial butchers. This meat escapes inspection. With no wish to exaggerate the danger of the propagation of tuberculosis by meat, it cannot be overlooked. It is easy, by means of legislation, to protect the population from this method of contamination. Belgium has set us the example.

TUBERCULOSIS AND MILK.

That the milk of cows with tuberculous inflammation of the udder is used is very clear. Your great hygienist, Sir R. Thorne-Thorne, while pointing out that in England mortality in general of adults from phthisis has diminished since 1850 from 45 per cent., regrets to see that from the same date infantile mortality from tuberculosis increased by 27 per cent. According to him, this increase is entirely due to tuberculosis in the abdomen, caused by ingestion of contaminated milk in infants under a year old; for in England cowhouses

are not inspected. In France, to all appearance, the law allows this surveillance. It is entrusted to mayors, but to put the law into execution the mayors must know the cows suffering from tuberculous mammitis, and they can only know this if the owner reports it. Now the dairies only report their cows when their milk is dry, when, in fact, they are no longer dangerous to the consumers. It is well to add that in large concerns the milk from different sources is mixed, and one cow only need be the victim of tuberculous mammitis in order to contaminate all the milk with which its milk is mixed. To prevent this method of propagation, strict inspection measures should be adopted, such as have been in use for several years in Denmark, Sweden, and Norway, to the great advantage of public health. Until such necessary measures are actually adopted, there only remains the simple mode of avoiding risk from milk by boiling it, and this should be widely made known, in spite of a too widespread prejudice, which wrongly holds that boiled milk is less nutritious and indigestible.

THE CURABILITY OF TUBERCULOSIS.

If a man is the victim of tuberculosis everything possible should be done to cure him, for he can be cured. There is no doubt of this. The idea that tuberculosis can be cured dates back to Hippocrates: "Phthisis, if treated early enough, gets well," said the Father of Medicine.

After 25 centuries we are supporting the same theory, which to some may appear paradoxical. Still, all anatomopathologists have confirmed its truth. In 1838 Carswell, one of your distinguished physicians, wrote: "Pathological anatomy has never, perhaps, given a more decided proof of the cure of a disease than it gives in cases of pulmonary phthisis." Laennec, Nat. Guillot, Letulle proved that in more than half the necropsies made old healed tuberculous lesions were to be found. As Dr. Ribard has said:

These figures from the very similarity of their results are striking. They show very clearly that half the men said to be well and non-tuberculous, dying of old age, or fortuitous cause, have at a certain time in their life been attacked by tuberculosis, but have recovered. Many are therefore affected, and many recover. Half the human race has tubercles and goes on living without discovering them. This fact established by necropsies is really very comforting.

As for my personal experience at the Morgue in Paris, where I frequently make necropsies on accidental deaths, I can state that in half the cases if the person on whom the necropsy is made has lived in Paris for about ten years, I find healed tuberculous lesions, either in the form of cretaceous transformation or fibrous cicatrization. I may add that it is quite certain that such cases of old people, and those on whom necropsies are held in almshouses, hospitals, and the Morgue, have certainly taken none of the precautions we consider necessary. In spite of often deplorably dirty habits the system has been strong enough to resist the ravages of the disease.

These anatomical results have also another meaning. These lesions, in the majority of cases, are not phthisis in an early stage manifested by small disseminated foci; they are cicatrices of large foci, sometimes of wide cavities completely cicatrised. Phthisis, therefore, is curable, even in its most advanced stages. This is not only maintained by anatomo-pathologists but by all medical men who have made a special study of the disease. Grancher sums the matter up thus: "Tuberculosis is the most easily cured of chronic diseases." As a tuberculous patient can be cured, everything possible must be done to bring this about by careful organisation. The doctor, being himself firmly convinced that his patient can be cured, will make the necessary modifications in his way of looking at the disease. Formerly, when a doctor thought that he could do nothing for a patient suffering from tuberculosis, he had not the courage to tell the patient or his friends the nature of the disease. He considered it his duty to keep up appearances until the time came when the case was hopeless.

Now, we require a doctor who is convinced, we trust, that tuberculosis can be cured, to behave in just the opposite way. If it is true that in every stage tuberculosis can be cured, it is certain to be true if the patient has been caused to take the necessary precautions in the pre-tuberculous stage, when lesions are very small, and when there is sufficient power of resistance in the patient's system. The doctor should tell the patient and his family that he has a serious disease, but

that it is curable. If he does not tell him at once, he renders himself liable to be reproached by the patient or his friend for having deceived them. This change of demeanour in the medical man will only be possible when a society is formed—which I hope will not be long—enabling the doctor, at the same time that he tells him the nature of his complaint, to tell his patient the best scientific methods of treatment for him to use.

METHODS OF TREATMENT.

What are the best methods? How are they carried out in the different countries? In this address I am only dealing with the disease as it affects working men and employees. I am leaving out of the question well-to-do patients, though these may gain some idea from it of the rules to be observed. The remedies to be recommended vary according to the stage to which the disease has got, and also according as to whether the patient is single, married, or father of a family.

IN THE EARLIEST STAGE.

Three distinct periods may be defined. In the earliest the patient coughs and has a cold. What does he generally do? Either he takes no notice of it or asks the chemist for a mixture for his cough. Days, weeks, and months go by, and if the weather is inclement he gets worse; if it is mild, he has periods of being better, followed by more serious attacks. Then fever and wasting set in, and he has to give up his work. He thinks illness has just begun. We know that he is entering the second stage, when even skilled treatment is probably useless.

The first stage of the disease, therefore, interests us most, when intervention is of use. In what way can we be of use to a patient in the first stage?

DISPENSARIES.

In Germany there are polyclinics for tuberculosis in the large towns, where a doctor, provided with the things necessary, attends to the patients who come to consult him, either throughout their illness or till the patient can be admitted into a sanatorium. A Committee, composed of large numbers of benevolent men and women looks after the patient at home, tells his wife what to do, sees that his home is kept clean, and looks after necessary prophylactic measures. As far as possible the poverty due to the breadwinner being out of work is relieved from a bank, kept up like the sanatoria banks, to assist such cases.

M. Calmette conceived the same idea, but he went farther, and advised that instead of waiting for the workman to come for advice, we should go and meet him by inviting him to come to a dispensary, run on the same lines as the German polyclinics. This is his own description of his project given in 1899:

Instead of waiting till the patient with tuberculosis comes to consult a doctor, and is driven to give up his work, I think that it would be better to establish the principle of going to him and offering him help before he finds out even that he is dangerously ill. I should like to be able to hunt out tuberculosis as soon as ever it has begun, and to be able then and there to give the sufferer advice and the care necessary, while generally keeping him in his own family circle.

Mr. Calmette has carried out his proposal: he opened an anti-tuberculous dispensary at Lille, called Emile Roux, and it has been eminently successful. Dr. Bonnet has founded a similar institution in Paris, in the Montmartre quarter; and others are about to be established, one at Vaugirard, with municipal aid. Experience shows that workmen do not shun these dispensaries; some come because they have a cough, others because they know themselves attacked. As far as I can see, the best way to ferret out disease would be to have one or more agent-workmen, foremen, if it were possible. They are the ones to notice when their comrades cough; they could advise them to go to the dispensary. Alive to the dangers of a badly-kept workshop or yard, they will superintend its being kept clean and in order; they will actually carry out antituberculous education. Those who visit the dispensary receive the necessary attention from the doctors, and are told the danger of dissemination by sputum, alcoholism, etc. They are looked after, they get meat soup—one or two meals, as far as funds will allow. Their families are helped and an eye is kept on their home from the hygienic point of view; as far as possible the poverty by which the poor man is threatened is kept away from him.

SANATORIA.

Among these patients some are found who must be sent to sanatorium. If the patient is an unmarried man, and if he can be sent to a sanatorium, his chances of recovery are very great; but for a married man to go means that his wife and family must be provided for during his absence, and his mind relieved of all anxiety on their account. Relief banks for assisting the families of the inmates are most necessary to sanatoria. And in many cases sanatoria are essential to complete the work begun at the dispensary. It is not my business to deal with the question of building and management of a sanatorium. We need only remember that they should be closed, aseptic, disciplined, and worked on Dettweiler's principle; physical and moral rest, stuffing, and open-air treatment. In Germany this system has been carried out most enthusiastically through the assistance of private benevolence, municipal, industrial, and parochial aid; the State has generously supported the effort, recognising its value. In Germany there are 83 public sanatoria open or ready to open. They accommodate 12,000 patients a year. They have been built by local insurance, by sickness banks, by the manufacturers, who have combined to found sanatoria for their workpeople, by parishes which have united for the purpose. There are most of the latter. In some parts, a tax of from a penny a head has been exacted. The State has founded several sanatoria for its servants: the Forests Department, Railway Department, and the State of Hamburg. The Commission of the Budget of the Reichstag decided to build State sanatoria under the control of the Ministry of the Interior. The treatment lasts at least ninety days, and experience has shown that it was good for the patients to spend another month, in the year following recovery, at the sanatorium.

Under these circumstances, how long do the patients keep better? Of those who leave the sanatorium in what is considered a satisfactory condition, it has been shown that 46 per cent. in 1896, 47 per cent. in 1897, 53 per cent. in 1898, 60 per cent. in 1899 were able to work. The cost per head per patient for the three months' stay amounts to eight francs per diem, including the cost of assistance given to the patient's family, which is a third of the amount. In a very interesting report, Dr. Pannwitz points out *desiderata* thought out by various medical men. Regret is expressed that nothing has been done for women and the middle class. Drs. Schroeder and Naumann Reiners justly point out that in patients of the middle class initial symptoms are more readily recognised, that they are more provident, and not so inclined to get overworked when they leave the sanatorium as the working class do, and thereby compromise their recovery. Experience has shown, as Persson says, the doctor is worth so much, the sanatorium is worth so much; and to provide doctors for sanatoria, a special course of instruction will be established. Dr. Pannwitz is very emphatic that if a sanatorium is to be well and economically managed it should be neither far from a town nor placed on a height; he expresses the wish that their erection were less costly, for it amounts to 10,000 marks per bed, and he thinks it should not exceed 4,000 marks.

Experience has, however, shown that a sanatorium is not a source of danger to a neighbourhood. What is dangerous is phthisis at large, which disseminates sputum everywhere in the house where patients are received without being controlled. Surveillance is quite indispensable. Dr. Pannwitz mentions two villages in the Hartz mountains which were decimated by these dangerous places. Lopo de Carvalho says the same about Guarda, in Portugal. For the safety of all concerned, every house where tuberculous patients are taken ought to be open to State inspection. Germany's example has been followed. England, Scotland, Australia, Canada have erected some few sanatoria. In Austria, Schröter had the Sanatorium d'Alland built, with 300 beds. Chevalier Don Kersy turned into small sanatoria some huts of the Duke type. In the United States they set apart portions of hospitals to make consumptive wards of them. They made about thirty such small sanatoria. The Association of Alabama built one for prisoners, the Naval Department one for sailors. New York has at present six sanatoria.

By the munificence of the Czar, the Etablissement Halila, in Russia, was built in 1897; and, since 1898, that of Tactzi, with two pavilions accommodating 20 beds for men and 20

beds for women. At Salta Princess Barjatinska has founded an establishment for schoolboys. The King of Sweden gave the sum collected at his jubilee (2,300,000 crowns) to build three sanatoria; Parliament voted 800,000 crowns for the same object; and the State gave the ground required for these three sanatoria. Denmark has already two sanatoria, and there is a scheme before Parliament for the erection of public sanatoria. Italy and the Netherlands and Norway have followed suit. In France several sanatoria have been opened: Hauteville, near Lyons; Agincourt, for Paris. Since 1876 we built the Home of Villefuite, and then that of Ormesson, for young tuberculous patients; and we may mention, in addition, the agricultural colonies of Caunet, the Jean Dollfus Home at Cannes, the Sanatorium of Gironde, that of Cimiez, near Nice, Argeley, and finally those which have recently been opened or will be: Lille, Nancy, Orléans, Versailles, Amiens, Havre, Marseilles, and in Paris, the Bligny and Rouen sanatoria, etc.

All nations have obeyed the same generous impulse, and the time will come when, instead of the poor tuberculous patient being given up to his sad lot, he will find that he is only in the first stages of the disease, that by means of dispensaries and sanatoria there is always hope and often realisation of his recovery. If the patient is beyond the first two stages when he asks for admission to the hospital, it must not be overlooked that he may still be cured, provided he can be made to see things as they are. He must be isolated, in order that he may not be discouraged by the spectacle of his comrades' sufferings. Rules of isolation have been drawn up by Grancher and Thoinot for the patient, for his nurses; you have them in use in your own consumption hospitals. At Brompton, in twenty years, 15,000 consumptives have been cared for. No doctor or officer or nurse has been infected. This statement is supported by Dr. Williams, physician of the hospital, by Moeller, and by Masbrenier.

CONCLUSION.

When I was asked by the Committee to tell you in my address (which I am sorry I could not make shorter) what steps had been taken by the different nations to carry out the crusade against consumption, I was also asked to consider the question from the international point of view. I do not think that it is possible to deal with consumption in this respect as plague, cholera, and yellow fever have been dealt with in order to prevent their being brought into a country. I do not know how any doctor can state positively that a traveller at the frontier or the port is not consumptive. But it would be possible to take international steps in another way. Railway carriages might be disinfected, as well as steamboats and hotels, and the traveller no longer exposed to germs of contagion. That would be of truly international import. The Minister of Public Works in France has recently sent a circular to railway companies calling their attention to the precautions necessary to obviate or diminish risk from tuberculous contagion.

In several countries, particularly in the United States, hotel keepers who receive a consumptive client have to notify it to the municipal authorities, and compulsory disinfection of the room has to be gone through. The Minister of the Interior in Germany has brought in even more stringent measures. Every doctor who attends a case of pulmonary or laryngeal tuberculosis is bound to report it in writing to the police as soon as he has made his diagnosis. After death from tuberculosis the room in which the patient has died has to be disinfected and also his belongings. Hotel proprietors, "furnished house" keepers, asylums and other public institutions are compelled to notify at once every case of tuberculous disease which arises in their establishments. Notification, disinfection, salubrity of hotels, carriages and steamboats are questions of an international character which might be advantageously dealt with by representatives of the different nations.

The lesson to be drawn from the efforts that have been made by all nations to carry out a crusade against tuberculosis is that in conversation, in the public prints, and in specially-prepared pamphlets, we should make it universally known that tuberculous contamination can be avoided, and that, in addition, the disease can be cured. Once convince our fellow citizens on these two points

and private initiative will be left behind; antituberculous efforts, numerous now, will multiply and co-ordinate; parishes, provinces, and the State will not be able to stand aloof from a common effort, and we may reasonably prophesy that, united in one brave attempt, the whole civilised world will succeed in exterminating the cruellest scourge that has ever fallen on us, our children, and our friends, and which threatens the future of our countries.

Ten years ago, at the Congress of Hygiene in London, I spoke as follows:

When, at the beginning of a century, one can inscribe the name of Jenner, and at its end that of Pasteur, the human race may rejoice; more has been done for it against misery, disease, and death than in any one of the centuries which have preceded it.

All honour to the nineteenth century, but the century just begun, in its first year, sees the greatest effort that has ever been made in favour of public medicine; may no obstacle stand in our way, and may those who succeed us at the end of the twentieth century be able to bear witness that our conviction has not been fruitless, and that the results have answered the expectations of the nations that you, gentlemen of the Organising Committee, have brought together with the highest and noblest motive that has ever animated the human race.

A DISCUSSION

ON THE

TREATMENT OF CONSUMPTION BY CLIMATE.

I.—INTRODUCTORY ADDRESS

ON THE CLASSIFICATION OF CLIMATES AND COMPARISON OF RESULTS.

By C. THEODORE WILLIAMS, M.A., M.D., F.R.C.P.,
Consulting Physician to the Hospital for Consumption and Diseases of the Chest, Brompton.

GENTLEMEN,—The questions we are invited to discuss to-day are:

1. What influence has climate on the treatment of consumption?
2. How far can cases be grouped for treatment in certain climates?

Both these questions have been the objects of my study for the last thirty-five years, and I will place before the Section some of the conclusions which a large experience has enabled me to formulate, omitting, except where it is absolutely necessary, the facts and figures on which they are based.

In all ages has existed a belief that consumption could be successfully treated by change of air—either from town to country, or from inland to seashore, or from valley and plain to mountain—and such belief has been the result of favourable experience of these changes.

In some lands, like Peru, the natives can point to instances of arrest of consumption from a transference of tuberculous folk from the sea-level to the mountains, and as no special attention has in these cases been paid to dietary, habits, nursing, or sanitation, the arrest of the disease must be attributed to change of climate, and to change of climate alone.

Sea voyages have possessed a great reputation for the treatment of phthisis, and especially in this country, and it must be admitted that they offer a most effective way of applying the open-air system; for what patient undergoing sanatorium treatment can obtain the amount of fresh air which comes into contact with the body and lungs of an invalid seated on the deck of an Australian bound clipper or steamer as she speeds through the waters? Doubtless this is the cause of the improved powers of digestion and assimilation which are so marked a feature in sea voyages, and of the large gain of weight which follows even where the larders are indifferently stocked. A few years ago sea voyages were the commonest recommendation for consumptives, and we all probably can remember cases of striking advantage derived from them, but at present, though the vessels are better equipped, the food