Art. XVII.—*The Fight against Tuberculosis in the Australian Colonies and New Zealand.*

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[*Read before the Hawke's Bay Philosophical Institute, 19th May, 1902.*]

Though I realise that possibly at first sight this question might be considered as one of interest rather to the medical profession than the public at large, yet, as I hope to be able to point out, the question at the present time is very greatly one for the public, and our strongest hope for effectually crushing this formidable foe lies in an intelligent understanding by the people of the nature and magnitude of the evil and its remedy.

Doubtless many of the things I shall bring under your notice are already known to you, owing to the active and increasing interest taken by the Press and public in questions of public health. Tuberculosis is a question receiving world-wide attention, not only of scientific men but of educated laymen. The scientist knows the cause of the evil and the means of combating it, but the public must be the conquering army laying that evil low.

This paper is intended to show not what is being done in the world generally to combat tuberculosis, but to point out what is being done nearer home—namely, in the Australian Colonies and here in New Zealand. Before doing so, however, it would be well first of all to state briefly a few facts concerning the causes of tuberculosis. These are so well known that my excuse for mentioning them here is solely that your memories may be refreshed on the subject.

In 1882 Koch demonstrated that tuberculosis in every form was due to a minute organism which he named "the tubercle bacillus." Bacilli, as you know, belong to the lowly form of vegetable life known as the fission fungi. Reproduction occurs with great simplicity and marvellous rapidity. A rod-shaped organism or bacillus splits into two halves, which rapidly grow to full size, when each splits again into two, and so on in a geometrical progression until in a very short space of time, under favourable circumstances as to food-supply, &c., a single bacillus will give rise to millions. The individual bacilli are microscopically minute, much smaller than the dust-specks seen floating in a sunbeam, so that if the bacilli are present in the air nothing is easier than to fill our lungs with such air containing large numbers of these organisms ready to attack us and establish the dread disease. Should the tubercle bacillus lodge in a part of the body—say, for

instance, the lungs—and find the locality favourable for its growth, it begins to multiply, damaging the tissues badly during the process, and the condition known as tuberculosis of the lungs becomes established. The point to be emphasized here is that every form of tuberculosis is caused by the tubercle bacillus, and by it only, and therefore the eradication of tuberculosis means the eradication of the tubercle bacillus.

Under ordinary circumstances tubercle bacilli are extremely tenacious of life, though with suitable means they may be easily killed. The sputum of consumptives teems with these organisms, and is the most prolific means of spreading infection. So that clearly this is a question requiring serious consideration.

We have all observed the absence of dust inside our homes as well as out-of-doors in damp weather, the reason being, of course, that the moisture in the atmosphere condenses on the particles of dust in a room, overweights them, and they sink down and settle on the floor or walls, the air so becoming clarified. I mention this every-day fact to make clearer a point I wish to bring out—namely, that it is not the sputum or spittle just when dejected from a patient in a moist condition and so containing the bacilli in certain confined limits that is the trouble, but the danger arises when the sputum dries up, becomes pulverised, and floats about in the atmosphere, to be breathed in by all and sundry.

We do not all get tuberculosis, though frequently exposed to risks, any more than we get many other diseases; that, however, is another question, introducing the subject of immunity, which it is not within the scope of this paper to discuss. Suffice it, then, to summarise thus:—

(*a.*) Tuberculosis in every form is due to the tubercle bacillus.

(*b.*) The most fertile, if not the only, source of human tuberculosis is the sputum of consumptives allowed to dry and get converted into dust, so contaminating the air.

(*c.*) Tuberculosis is infectious.

(*d.*) Tuberculosis is preventible.

Tuberculosis is, then, an infectious disease, and any person, place, or thing contaminated by the expectoration of consumptives is a focus of infection for human beings. Hence houses or rooms inhabited by consumptives are infectious, as has been sufficiently proved many times; also handkerchiefs, &c., used by such persons are obviously infectious, and the filthy habit of indiscriminate spitting is a prolific source of infection.

I think the above is sufficient explanation of the main factors in the spread of tuberculosis so far as is relevant to

this paper. Let us now consider what we in the colonies are doing in the matter of checking the evil, and so take up our subject proper. I will begin by first stating how things stand with us in New Zealand, and then compare the other colonies.

During the last two decennial periods there has been on the whole a steady decline in the death-rate from phthisis in New Zealand. In 1900 the figure for phthisis stood at 7·56 per 10,000 living, and for all forms of tuberculosis 9·85. The deaths from tuberculosis represented as a percentage of total deaths equalled 10·44 in 1900. Practically throughout the last decennial period phthisis heads the list of all causes of death. The New Zealand Year-book contains the following paragraph *re* phthisis: "In all the Australian Colonies the rate is materially increased by the deaths of persons who have come out either already suffering from phthisis or predisposed thereto. There is no reason for believing that this circumstance has more effect on the death-rate in Australia than in New Zealand; so that the lower rate referred to in previous issues of this work as obtaining in this colony may be taken as proof of its superior climate for withstanding consumptive tendencies."

The Health Department here has issued circulars and handbills, also large-type placards, on tuberculosis, which latter are posted up in public places, and the former widely distributed. The language used is plain and free from any technicality, and points out that tuberculosis is an infectious disease, exhorts people not to spit in public places, explains the necessity for disinfection of infected rooms, &c., and how consumptives should deal with their sputum in order to minimise the risks of infection of others.

Our Public Health Act of 1900 is a very up-to-date Act, and provides for the notification of infectious diseases (in which are included all forms of tuberculosis). The occupier of the house, as well as the medical attendant, has to notify every case of tuberculosis. When the disease has been notified the Act provides for disinfection of infected premises. A penalty is provided for selling infected things, or letting houses or rooms where an infected person is lodging. The Act also deals with the question of overcrowding. "The Factories Act, 1901," deals with the notification of persons suffering from tuberculosis if engaged in the handling, &c., of any article for human consumption. It deals also with persons working up goods or materials in infected dwelling-houses. Our local bodies have power to make by-laws against spitting in public places; Wellington and Christchurch have recently made such by-laws, Auckland and Wanganui are moving in the same direction, and doubtless many other places will follow a similar course. The railway authorities

have no by-laws or regulations dealing with this subject. The Veterinary Department is doing excellent work, aimed at the eradication of tuberculosis in cattle, and has very full powers; and "The Dairy Industry Act, 1898," deals satisfactorily with the subject of milk from diseased animals and insanitary milk-shops, &c. The last thing to be mentioned, though, as often, not the least important, is the question of sanatoria, and the Government has already made a move, and ere long we may hope for at least one sanatorium in each Island. Thus, as briefly as possible, I have outlined what we in New Zealand are doing in the fight against tuberculosis; and, as will be seen immediately, we are second to none of the other colonies, and in some things a good deal ahead of them.

Now to consider what the Australian Colonies are doing.

Notification.

In New South Wales and Queensland there is no notification of human tuberculosis, but houses are disinfected in which persons have died from phthisis.

Victoria has no compulsory notification, but the Board of Health invited information from ratepayers and District Registrars of cases of consumption and deaths from that disease, and undertook the disinfection of premises. Melbourne has volunteered to look after the matter, and local Registrars report all deaths from tuberculosis, and then the local authority carries out disinfection of premises. Outdoor hospital consumptives are notified, and then their homes are visited and instructions given.

South Australia, like ourselves, has compulsory notification on practically the same lines; its Act was passed in 1898, two years before ours.

Tasmania has no notification.

West Australia has notification of pulmonary tuberculosis.

From this it will be seen that South Australia and New Zealand are ahead of the other colonies as regards notification, meaning that, whereas the other colonies only disinfect premises after persons have died in them, the two colonies mentioned can disinfect every time a person changes his place of abode.

Meat and Milk.

Most of the colonies have legislation on the subject of meat and milk.

Queensland has been very behind-hand in the matter, but under the *régime* of the newly appointed Health Commissioner there is promise of more efficient control.

Again South Australia and New Zealand go hand-in-hand with municipal abattoirs, the only efficient method of dealing with diseased meat.

In many of the colonies dairy inspection is anything but satisfactory. To quote a Victorian writer on the subject, "Very few Councils have appointed veterinary inspectors, dairy inspection being often but one of the duties of an officer whose functions are as multifarious as those of 'Pooh Bah' of operatic fame."

Spitting.

New South Wales local bodies have power to deal with this nuisance, and Sydney has with great success enacted by-laws against street spitting, and so strictly carried them out that their success in purifying the condition of the pavements is astonishing. Efforts are being made to prevent spitting in tramways, trains, and public vehicles of all kinds.

Queensland has similar powers to New South Wales, and Brisbane has municipal by-laws against street spitting. The railway authorities have also passed by-laws against spitting, which, however, they have failed to carry out.

Victoria and South Australia have no legislation against spitting.

Tasmania has the pride of place in the colonies in this matter, as Hobart and Launceston, in 1896, first of all the colonies made by-laws against spitting in public places.

West Australian local bodies have powers, if willing, to make by-laws on the subject.

Sanatoria.

New South Wales has a hospital for consumptives near the Blue Mountains. It has forty beds, and is maintained entirely by public benevolence. Incurable cases are not treated there, many such cases being treated for a time in the general hospitals. Incurable pauper cases are treated in the Government asylums, and many sufferers from advanced phthisis are cared for in their last days at Saint Vincent de Paul's Hospice for the Dying in Sydney. The Government, however, has promised to take the matter up, and to erect immediately a temporary wooden sanatorium, pending the erection of a permanent structure.

Queensland has two sanatoria for consumptives, one in the Darling Downs, of fifty-five beds, and another larger one on the Diamantina.

South Australia has a sanatorium for fifty persons near Adelaide, and the Government intends shortly to provide accommodation for incurable cases.

Victoria has the Austin Hospital for incurables, which has a special wing set apart for advanced cases of phthisis, containing forty beds. There is also the Consumptive Sanatorium, established twelve years, a charity supported by public benevolence. This has two branches, one at Echuca, for forty patients, which establishment is not self-contained, being more of a convalescent home, the patients going out into the town and parks in the day-time. Patients go to Echuca in the winter, and to the sanatorium at Macedon, which is self-contained, for the summer.

West Australia and Tasmania have no sanatoria for consumptives.

From the facts mentioned in the above paper it will be readily seen that we have little or nothing to learn from our Australian cousins in the way of grappling with the tuberculosis curse, and we have ample powers in our Public Health Act for guarding the public health.

I think all will agree that this subject of tuberculosis is one deserving great attention, as the consumptive is often the family bread-winner. If he can be cured by any means let us cure him; the less the State does for him the more burden he becomes. His case is not like that of many deadly diseases of short duration, his illness often being protracted for years, during which time he becomes of less and less use to the State and a source of danger to others. So from purely economic if from no other motives let us do all in our power for him, while at the same time we wage a deadly war against the enemy which has crippled him and so many millions of the human race.

ART. XVIII.—*Malaria and Mosquitos.*

By ERNEST ROBERTON, M.D.

[*President's Inaugural Address to the Auckland Institute, 9th June, 1902.*]

IT has been the custom of our Institute since its foundation that the President should, at the inauguration of each series of winter lectures, deliver an address. In choosing my subject for to-night I have followed the precedent set by most of those who have previously occupied this chair in selecting a subject not directly connected with our Institute itself, but one which has general interest for all those who are concerned in watching the progress of science.

The latter end of the nineteenth century has been very fruitful of discovery in the realm of preventive medicine, and