(December 11th, 1916.)

Guarding a City's Health

By Dr. Chas. J. Hastings.*

AT a regular luncheon of the Club held on the 11th December Dr. Hastings said:

Mr. President and Gentlemen,—There has never been a time in the history of the British Empire in which human life and human efficiency have been held at as high a premium as at present, and consequently at no previous time has there been occasion for such efficient safeguarding of human life and human fitness. Almost as far back as history carries us, there is evidence of those in authority having had some conception of the necessity for sanitary regulations. We find this among the early Egyptians and, in fact, in all civilized nations. In that admirable code compiled by Hammurabi 2,200 years before Christ, which was unearthed in 1902 in the Acropolis Mound at Susa, one recognized that he had in mind the necessity for the adoption of sanitary measures in order to safeguard human life. However, it was given to Moses to codify these sanitary laws and regulations, which were subsequently enforced more or less efficiently until the early part of the present era. But unfortunately, in the early ages, a set back was given to public health administrators on account of superstition and the doctrinal delusions that disease and pestilence were visitations of divine wrath, in consequence of which the attention was diverted from preventation to cure, to the building of hospitals, alms-houses, and so forth. It was this, no doubt, that Ruskin had in mind when many years ago is referring to public health work he said, "Any reforms which tend to improve the health of the masses are looked upon by them as unwarranted interference with their vested rights in inevitable disease and death," so that it was not until 1847 that the first health officer was appointed in Great Britain, and even then little advance could be made until the establishing of the germ origin of disease, which placed preventive medicine or public health administration on a scientific basis. Previous to this, it was thought that the different communicable diseases were transmitted by means of sewer gas and decomposing house-

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hold wastes such as garbage, etc., and most of the time and money of departments of health were devoted to the abating of nuisances, plumbing inspection, garbage collection and disposal. It is now known that diseases are practically never contracted in this way. These duties constitute the æsthetic side of public health work, and can probably be better done by departments of health than by any other department of a city's administration, but should not be charged against the prevention of disease. Diseases are only contracted by coming in contact, directly or indirectly, with one suffering from the disease, or with a carrier. Disease germs do not generally live long outside of the human body.

Now, with a knowledge of our common enemies and their haunts and habits, and the ways and means by which they gain access to the body, and also with the knowledge of the resisting powers of the body, it became apparent that any well organized campaign against these diseases must be directed along two distinct lines—in the first place preventing these disease germs from gaining access to the body, and secondly, the building up and maintaining of the resisting powers of the body. To this end it is essential that we take into our confidence the citizens, tell them what we are doing and why we are doing it.

The two most outstanding sources of the transmission of disease in any community is their water supply and milk supply. This must be apparent from the fact of the innumerable possibilities of their contamination and also their universal use, so that the safeguarding of the city's water supply and milk supply must be first established. Toronto's water supply, while not at all times as palatable as we would like to have it, is at all times absolutely safe. But, inasmuch as only about one-third to one-half of Toronto's water supply is filtered, it has been imperative to chlorinate our water constantly in order to keep it safe.

When we began our campaign to improve our milk supply, we found that 40% of the milk sold in the city was being watered, and the average amount of water put in the milk was 20%. This meant that the citizens in 1911 had been paying $275,000 for water, thinking that it was milk. With the increased consumption of milk in 1915, Toronto would have been paying $322,000 for water, if the same conditions had existed, but in 1915 there was no milk permitted to be sold in Toronto that was watered. Hence the citizens in food value alone were saved $322,000. The entire expenditure of the Department for 1915 was $309,000, so that we had $13,000 to our credit on this item alone. Obviously, the same organiza-

tion that was necessary to bring about this improved condition, is necessary to maintain the condition. Eternal vigilance is the price we have to pay for our pure milk supply. To this we have to add what we have done to safeguard our citizens against milk-borne diseases, such as the various forms of infantile diarrhoea, typhoid, diphtheria, septic sore throat, and bovine tuberculosis, by the system of the veterinary inspection of the dairy farms and rigid supervision of the dairies in the city and the use of the sedimentation test by which we can determine whether or not milk is being produced under sanitary conditions. We thus succeeded in securing for Toronto a milk free from barnyard contamination, but this milk, though clean, was not bacteriologically clean and the only means by which this can be accomplished is by scientific pasteurization. This means a heating of the milk to 145 degrees and holding it at that for thirty minutes. This does not interfere in any way with the chemical composition, the nutritive value or the digestibility of the milk but it does destroy all disease-producing germs.

An effort has also been made to safeguard citizens against communicable diseases by a rigid supervision of all of our food supplies. For instance, our restaurants are all required to have in addition to the sink for washing all drinking and eating utensils, proper facilities for the sterilizing of all, and are not granted a license until they are equipped to carry out these requirements. In bringing about these reforms, we were submitted to all sorts of criticism and abuse, but criticism has about as much effect on me as water on a duck's back. When I went to the Department, I knew I had a duty to perform and I went determined to perform it though all hell should order me silent. We have endeavored to follow the precepts of Wellington, "Be sure you are right and then go ahead."

In order to accomplish these reforms, we have had to secure the co-operation of those with whom we have to deal. This means education. We are fortunately living in an age when people no longer want to be treated as machines. When they are told to do things, they want to know why. Therefore, the first duty of the Department of Public Health is to educate the public. We are consequently endeavoring to enlighten the public through the press, health bulletins, public addresses, leaflets, and in every other way that we can hope to reach them.

But, inasmuch as there are tens of thousands in every large city who cannot read, or for various reasons do not read, it became apparent that in order to reach those who are obviously the ones most requiring education, we would have to get

nearer to them; we would have to get into the homes and in that way democratise the knowledge that has for years been kept within the precincts of our universities and laboratories. This knowledge had to be translated into terms that could be understood by the man on the street and the house-wife in the humblest home.

This, it was apparent, could best be accomplished through the medium of our public health nurses. The duties of the public health nurse embrace tuberculosis, child welfare, prenatal child hygiene, and social service. They attend all the tuberculosis clinics, the well-baby clinics and the clinics in the various hospitals in the city. Tuberculosis cases attending the clinics are followed to the homes and instructions given there as regards the prevention of the spread of this disease. The people in the home are instructed as to the ways and means by which this disease is spread and all those in the homes, who have come in contact, are encouraged to go to the clinics and undergo an examination. The advanced cases are sent to the hospital for advanced cases. The early cases, if they cannot be properly cared for in the home, are sent to one of the sanitoria, and the smaller children who have not any clinical symptoms are sent to the preventorium. While in the home, the nurse ascertains what the revenue of the home is, and, if it is found insufficient to nourish the family properly, the cases are referred to the proper social agencies in order that this revenue may be reinforced. It is made clear to these people that the instructions given in regard to the prevention of the spread of tuberculosis in the home applies equally to any form of communicable disease that may invade that home.

But the problem of education is, for obvious reasons, a very difficult one. You will recall that Cobden, when endeavoring to repeal the corn laws, stated in the British House of Commons that he had come to the conclusion that in order to get anything through the heads of the British people, you require to repeat it over and over again in just a little different language, and, not long since, Sir Wm. Osler, when addressing a meeting of the New York Academy of Medicine on the subject of Education, stated that the essence of successful teaching consisted in "re-iteration, re-iteration, re-iteration," to which one of his colleagues added, "without irritation." We will all agree that the essence of our teaching is re-iteration without irritation, and there is no other medium through which this can be so well accomplished as that of our public health nurses, who are rendering a service in the home, and who have gained the confidence of the people in the home. No one wants sickness nor, much less, does he want death in his home.

Therefore, when these facts are made plain to them in heart-to-heart conversations with the nurses, they are likely to listen to them, appreciate them, and endeavor to profit by them.

Notwithstanding all efforts that we can put forth to save ourselves against the invasion of disease-producing germs, they will occasionally get by us, and to this end it is most essential that we build up and maintain the resisting powers of the body. Consequently, we find that behind all outbreaks of disease, and in fact with most sickness, there is a social problem that the revenue of the home has not been sufficient to secure for the inmates of that home sufficient nourishment or proper housing and clothing. Consequently, the vitality has been lowered and they have been rendered more susceptible to disease. Hence the necessity in any well organized department of public health for a division of social service. The chief of this division does the social diagnosis, which is sometimes even more important than the medical diagnosis. All complex social problems coming under the notice of the nurses are referred to him. In connection with this division, our nurses do the social service follow-up work of all but one hospital in the city, and in this way assure the anxious patient in the hospital that his home and children are being cared for. Public health administration means not only the saving of human life and the prevention of disease, but also all that goes to build up and maintain a fitter race. The control of communicable diseases is only a part of the duty and responsibility of departments of health.

We have also the industrial diseases, the wasting diseases of middle life and venereal diseases, all of which have been sadly neglected. Sir Thomas Oliver in a recent address pointed out that the aggregate cost of illness due to occupation alone in the United States amounted to $792,892,860 per annum, and this is for the most part preventable, but will not be prevented until our legislative bodies realize that the people and the physical fitness of the people represent the most valuable asset of the nation or the municipality.

Having recognized the dangers of industrial diseases, we organized in connection with the Department, two years ago, a Division of Industrial Hygiene. A careful survey was made of all the industries, and instructions were given as regards the necessary installation in order to control the trade fumes and dust, and secure proper and efficient ventilation. In this way we have met with most gratifying co-operation from the proprietors of practically all the industries in the city. Few employers of labor realize that they are ofttimes losing from 10% to 15% of the efficiency of their employees from improper heating and ventilation.

Another lamentably neglected field in preventive medicine is the control or an attempt to control the ravages of venereal diseases. These diseases constitute probably the most important factor in the degeneration and depopulation of the world. What these diseases represent in the lower working efficiency of our population, to say nothing of the increasing mortality, it would be difficult to estimate, and yet little has been done thus far to control them.

Then there are the degenerative diseases of middle life. It is difficult to understand the lamentable disregard that people have for their own bodies as regards degenerative changes which so frequently begin in early adult life. No man owning an engine, automobile, or a limousine that he has much regard for and in which he has a sum of money invested, will neglect having it carefully overhauled at frequent intervals. At the same time he fails to recognize the importance of having his family physician give him a careful examination once or twice a year in order that any degenerative change may be detected and got under control. The strenuous life, the mad rush for the almighty dollar, intemperance in eating, as well as in drinking, is largely responsible for these degenerative changes, and in this group of diseases alone lives could be lengthened from 10 to 15 years. One cannot but feel impressed when reading the Psalms, of which David is alleged to have written part, at least, that he had some conception of the possibilities of preventive medicine when with prophetic vision he wrote the following lines: "Thou shalt not be afraid for the terror by night, nor for the destruction that wasteth at noon day, nor for the pestilence that walketh in darkness." The Lord Bishop, Canon Plumtree, and other theologians present may not agree with my interpretation, but the "terror by night" points very markedly to malaria, which, previous to the plague, was one of the most destructive diseases in the East. It was thought to be due to the miasm in the air in low-lying swamp districts where there was stagnant water. This was always considered to be most dangerous at night—hence the fallacy in years gone by of the dangers of night air. As a matter of fact, night air is purer than day air, and in most cases, in large cities, more desirable inasmuch as it is much freer from dust, smoke and other contamination. However, in recent years it has been fully demonstrated that malaria is not conveyed in this way, but through the medium of a species of mosquito known as anopheles, and that this is the only means by which malaria is transmitted from one person to another. This is quite consistent with the observation always made that malaria existed only where there was stagnant water

—consequently where there was a breeding place for the mosquito. It is interesting to note in this connection that of over four hundred varieties of mosquitoes only one is responsible for the transmission of this disease, and one other species, the stagomya, is responsible for the transmission of yellow fever. General Gorgas and his staff of workers spent tens of thousands—yes, hundreds of thousands of dollars in endeavoring to get rid of malaria and yellow fever in Havana and Panama by a rigid carrying out of general sanitary principles, but this was a decided failure. However, it was just at that time that the fact was revealed, through Sir Patrick Manson and Sir Ronald Ross of the British Royal Commission that was appointed to investigate the transmission of tropical diseases, by Lavarand of France, and by Reed and his colleagues at Washington, that these two diseases, malaria and yellow fever, were only transmitted from one person to another through the medium of these two species of mosquitoes. Attention was immediately directed toward the control of the breeding places of these mosquitoes, and, in the meantime, to the protection of all citizens from being bitten by the mosquitoes, they being assured that they might better and safer be bitten by a mad dog. In brief, these two species of mosquitoes have practically been exterminated in Havana, Panama and the Panama Canal District, with the result that there has not been one case of yellow fever develop in any of these places for the past four years This is an outstanding demonstration of the possibilities of the control of these communicable diseases when we are sure of the means by which they are transmitted.

Then there is the Psalmist's observation in regard to the "destruction that wasteth by noon day,"—the wasting diseases of middle life, which are lamentably on the increase; and, thirdly, "for the pestilence that walketh in darkness,"—the venereal diseases, or let us call them "social diseases." These constitute but a few of the rocks and shoals upon which administrators of public health are required to place beacon lights to guard our people against untimely physical wrecks.

The question naturally arises, "Is the amount of money expended in Toronto on public health warranted?" We can only answer this by referring to the results that have been obtained. Those as are shown on the chart are as follows:

In 1910, the mortality from a group of the more acute diseases,—diphtheria, scarlet fever and typhoid fever, was 107 per 100,000.

In 1915, it was only 19 per 100,000.

For diphtheria alone, the mortality was 41.9 in 1910, and 10.3 in 1915.

In 1910, for scarlet fever, the mortality was 24.7. In 1915, 2.6 per 100,000.

In 1910, for typhoid fever, the mortality was 40.8 per 100,000.

In 1915, for typhoid fever, the mortality was 1.9 per 100,000.

Toronto was particularly fortunate in 1915. We can hardly hope to maintain as low a death rate as that from typhoid, as it is practically 4 per 100,000 lower than any other city of 300,000 or more on this continent. The mortality this year from typhoid will be somewhat higher, though no doubt as low as any other city on the continent, if not lower. Our infant mortality under one year of age in 1915 was 33% less than in 1910 and 37% less than the average in the fourteen years previous to that date. In other words, our infant mortality had decreased from 139 per 1,000 births in 1910 to 93 in 1915. This means that if the rate of infant mortality in 1910 had continued, there would have been 2,050 deaths of infants in 1915 instead of only 1,374, which represents the saving of 676 babies last year alone.

We hear the question asked from many sources, "How will the world be repopulated after the present war?" If we compare the mortality from all causes in the Canadian Expeditionary Forces since the outbreak of war, two and a quarter years, with the mortality from typhoid fever and tuberculosis alone in Canada, it will throw some light on a possible means by which the population can be restored. Deaths from typhoid fever and tuberculosis in Canada, since the outbreak of war two and a quarter years, are 17,350. Deaths from all causes in the Canadian Expeditionary Forces since the outbreak of war, two and a quarter years, are 15,766. Therefore, there were 1,584 more deaths from typhoid and tuberculosis in Canada than occurred among Canadian soldiers from all causes during the same period. Again, if we take the entire group of preventable diseases—typhoid fever, diphtheria, scarlet fever, whooping cough and tuberculosis, to say nothing of our preventable infant mortality and the mortality from preventable industrial diseases and degenerative diseases of middle life—the comparison is even more striking. The deaths from these preventable diseases in Canada since the outbreak of war have been 22,560. The fatal casualties in the Canadian Expeditionary Forces in the same period have been 15,766. The excess of deaths from preventable diseases over the fatal casualties amongst our soldiers in the two and a quarter years since the outbreak of war has been 6,794. It must be obvious then that if we put forth more strenuous efforts in the Dominion and

throughout the Empire to prevent the appalling sacrifice of human life from preventable diseases, the Empire will soon be repopulated.

Probably the principal reason why we have not been able to make more rapid advance in the science of preventive medicine is the inability of people to recognize a personal responsibility—to recognize the fact that no man liveth unto himself. This is very well illustrated by an incident that occurred in the State of Georgia where, in a small town, they had erected a building as a home for wayward boys. The Governor of the State, having heard of this, was sufficiently interested to consent to deliver the opening address. In doing so, he eulogized them, dwelt on the importance of the institution and what it would meant to the community, and in this connection said: "Ladies and gentlemen, if this institution is only a means of saving one boy, you will be amply repaid for all that you have expended in it." The convener of the committee, who had been responsible for the funds collected for this building, and, in addition to having contributed freely himself, had given a great deal of time, said to the Governor in coming out, "Governor, I enjoyed that address immensely and we are very grateful to you for it, but there is just one statement that I thought was a little far-fetched." "What was that?" said the Governor. "You said that if this building was only the means of saving one boy, we would be amply repaid for all we have expended on it. You know, Governor, this is a small place, and this building has cost us over $10,000, and don't you think that that was a little far-fetched?" "Not," said the Governor, "if that were my boy." It is only when we bring these matters home to ourselves that we can realize what the saving of one human life means; what the saving of one case of sickness in a home means, and we must not forget that the infant and the little boy and the little girl in the humblest home in Toronto is as precious to their parents as our infants and children are or ever have been to us.