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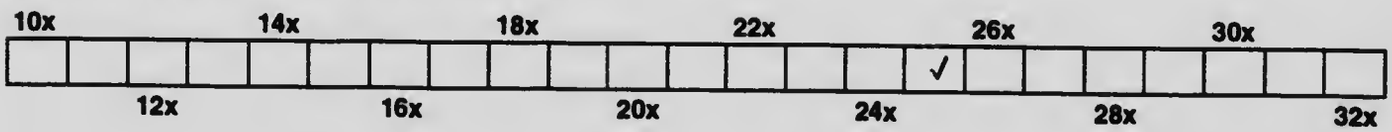

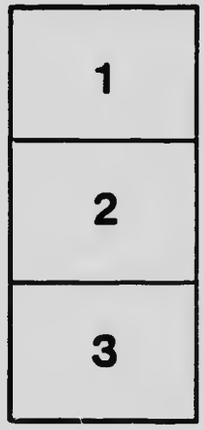

The Modern Conception of Public Health Administration and Its National Importance

BY CHARLES J. HASTINGS, M.D., L.R.C.P.I.
Medical Officer of Health
TORONTO

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THE MODERN CONCEPTION OF PUBLIC HEALTH ADMINISTRATION AND ITS NATIONAL IMPORTANCE

BY CHARLES J. HASTINGS, L.R.C.P.I., M.D.

Medical Officer of Health, Toronto

THE most appalling feature of the present international struggle for the principles of civilization is the great sacrifice of human life—the sacrifice of the best of the man-power of all nations. Here I might ask and do ask—in what respect does this differ from the sacrifice of human life and human efficiency through preventable diseases? The Kaiser and Junkerdom have made God the author of this international struggle and have chosen Him as their junior partner. On the other hand, superstition, doctrinal delusion, and incredulity have for centuries been making God the author of disease, and have blamed Him for all the disastrous results of its ravages. However, the principles of the democracy for which we are fighting, which in this connexion means the general diffusion of knowledge, bringing it within the reach of the people, places the blame where it belongs. The democratizing of the knowledge we possess as regards the cause of disease and the ways and means by which it is transmitted, is sweeping aside these superstitions and doctrinal delusions, and is transferring the blame from Providence to our failure efficiently to apply the knowledge we now possess. Incidentally we are giving man a truer conception of God.

In the various nations engaged in this war, in times of peace, over 6,500,000 die annually from preventable diseases. There have been fewer than 7,000,000 killed in action on all sides since the outbreak of war. Obviously then, all the battles in the interest of humanity and the interests of nations are not fought on the firing line. The perennial warfare waged against the invisible foe is as important—if not more so—than that now waged against those who are threatening the destruction of the very principles of civilization.

Public Address in State Medicine, delivered at the forty-eighth annual meeting of the Canadian Medical Association, held in Montreal, June 13th, 14th and 15th, 1917.

Early History of Public Health Administration

In order properly to appreciate the advances in public hea .h administration during the past decade, one requires to review briefly the history of preventive medicine. As far back as history carries us, and in fact, in prehistoric times, we find evidence of those in authority among the Egyptians, Greeks, and Romans having had some conception of the necessity for sanitary laws. One cannot run over the wonderful code of Hammurabi, king of Babylon, compiled 2,200 years before Christ, and which was unearthed in the Acropolis Mound at Susa in 1902, without feeling that he, too, had a full appreciation of the importance of hygiene. However, we have no record of these conceptions of the necessity for sanitation having been codified until Moses handed out his sanitary regulations about the beginning of the sixteenth century B.C. The three (3) cardinal principles of this sanitary code were—personal cleanliness, isolation of the sick, and the efficient safeguarding of the food supply. These sanitary laws were excellent and were, for the most part, well administered, especially as regards personal cleanliness and the care of the food. It is mor than probable that the comparative immunity of the Hebrews from epidemic diseases and plagues, as compared with the early Christians, Greeks, and Romans, was, in a large measure, due to personal cleanliness. This was particularly true of the Pharisees, who, as a religious rite, carefully washed their hands before partaking of food, believing as they did, that the eating of food with unclean hands defiled a man. They also emphasized the importance of washing all cups, pots, and brazen vessels, tables, etc. These hygienic principles were religiously carried out. Medical health officers were appointed in Rome in 495 B.C. They were placed in charge of districts and the sanitary measures carried out under their supervision were, in many respects, commendable. Tradition tells us that the Cloaca Maxima was constructed under the direction of King Tarquinius Priscus, 616 to 578 B.C., and is still used in the drainage of Rome and receives many branches between the Capitoline, Palatine, and other Hills. It is formed of three consecutive layers of enormous stone, one above the other, in concentric rows. The inside measurement is, approximately, 13 feet square. These, with the aqueducts, three of which are still in use, are marvels of engineering skill. However, the superstition and doctrinal delusions of the early ages, that disease and pestilence were a direct visitation of Divine wrath, caused them to turn their attention from prevention and preventive measures to

the building of hospitals, alms-houses, etc. It was this, no doubt, that Ruskin had in mind when he said that "any regulation which tends to improve the health of the masses is viewed by them as an unwarranted interference with their vested rights in inevitable disease and death." For these delusions they have surely paid the penalty in the early and middle ages, and even down to quite recent years, blaming Providence for diseases for which they, themselves, through ignorance, superstition, and incredulity, were responsible. It would be difficult to conceive of any greater reflection on our intelligence than retaining in our burial service, "The Lord giveth and the Lord taketh away." Is this not libelous on the Almighty? We are responsible in failing in our duty properly to apply the knowledge we possess of the cause of disease and how it is transmitted. For instance, Toronto's death rate from typhoid fever in 1910 was 40·8 per 100,000, and in 1915 it was reduced to 1·9. This was brought about for the most part by safeguarding our water and milk supply. Furthermore, since the organization of our division of infant and child hygiene, in 1914, our infant mortality has been reduced one third, that is, we had 676 fewer babies die than would have died, if the death rate previous to 1914 had continued. Toronto's general death rate in 1910, was 14 per 1,000—in 1915 it was 11 per 1,000, which meant a saving to the city of 1,102 lives. So that the Lord would have been blamed for these 1,102 that would have died, if Toronto had not adopted the necessary preventive measures. Let us place the blame where it belongs and remove many of the obstacles to efficient health administration.

It would seem as if David, king of Isreal, foresaw great possibilities in the sanitary laws of Moses. In the Psalms, of which he is credited with having written part, at least, he, with prophetic vision must have been peering into the future of preventive medicine when he said: "Thou shalt not be afraid for the terror by night, nor for the destruction that wasteth at noonday, nor for the pestilence that walketh in darkness." One cannot but be impressed with the apparent conception that the writer must have had of the control of malaria and yellow fever, "the terror by night" (through the anopheles, and the stegomyia mosquito); the control of venereal diseases, "the pestilence that walketh in darkness;" and the control of the wasting diseases of middle life in "the destruction that wasteth at noonday". Malaria was comparatively common in Italy as early as the Second and Third Centuries and was probably brought over by the soldiers or the Carthagenian mercenaries during the Second and Third Punic Wars. At that time the Roman Em-

pire aspired to extend to the most remote parts of the earth but disease and pestilence or plague reduced the population by one quarter to one half. The same was true of Greece, Athens, and other cities of Europe and Asia. It was, obviously, not the Gauls or Vandals that conquered Rome but the plague and malaria.

Rome had not realized that public health was a national problem and was the foundation on which rested the strength of the nation. It is interesting to note that, after the outbreak of the plague in different countries, in pratically every instance certain conditions were found to be present, such as an inferior quality and an insufficient quantity of food, filthy environments and decomposing animal and vegetable matter about the homes; in brief, there were associated with poverty and all that attends it, environments most favourable for rodents, vermin and insects.

Modern Conception of how Diseases are Transmitted

From the first outbreak of the plague down through the middle ages, and, in fact, until recent date, people were as unsuspicious of rats, ground squirrels, fleas, flies, or other animals or insects playing any rôle in the transmission of plague as they were of the anopheles mosquito playing any rôle in the transmission of malaria or the stegomyia mosquito in the transmission of yellow fever; or the body louse of typhus fever. In fact, it is only within recent years that we can boast of this knowledge. Without any knowledge whatever of bacteriology, administrators of public health were floundering without rudder or compass. The abating of nuisances, the disposal of sewage, the draining of the homes and the more or less effective quarantine of communicable diseases constituted the activities of public health administration.

The Germ Theory and Germ Origin of Disease

The germ theory of disease dates back at least to the Second Century, though it is only a few decades since this theory became a fact. There is every reason to believe that Aristotle was convinced that there were microörganisms that were responsible for disease. However, many years have passed, during which we have no record of any valuable research work having been done or any important observations made in regard to the germ origin of disease, until 1843, when the late Dr. Oliver Wendell Holmes, whose memory we are all delighted to honour, having convinced himself of the transmissibility of the so-called puerperal fever, wrote and published a mono-

graph on this subject, which, in itself, was sufficient to have immortalized his name. Three years after this, in 1846, Semmelwisse a young Hungarian from Budapest, being in charge of the Lying-In Hospital at Vienna, as a consequence of keen observation, was convinced that the so-called puerperal or childbed fever was transmitted to the patients in the lying-in wards of the hospital by the doctors who were engaged in pathological work in the dissecting room. This was probably the first evidence we had of this being a wound infection. In 1849, in a small town on the Rhine, a physician, named Pollenger, became interested in examining the blood of human beings and animals, both in health and disease. In examining the blood of cows suffering from anthrax, he discovered small, rod like bodies, which did not appear in the blood of healthy animals. This so interested him that he made a large number of examinations and repeatedly found these rod like bodies present in the blood of the animals suffering from this disease, therefore became convinced that there was some connexion between the two. He presented his findings, in the form of a paper or an address, to the medical societies, setting forth in detail the work that he had done, the observations made and the conclusions arrived at. This was subsequently published in the *Medical Journal* but there is no evidence of it having given any special concern to his colleagues. Later on, this work was taken up by Devaine, who went a little further than his predecessor and inoculated animals with the blood taken from those suffering from anthrax, with the result that they practically all contracted the disease. This research was subsequently pursued by Koch, Pasteur and others.

The Immortal Pasteur

To Pasteur, more than any other, are administrators of public health indebted for having so efficiently blazed the trail for scientific public health administration. As Elliott of Harvard expressed it, referring to the extension of Pasteur's work into biology: "The career of Pasteur illustrates admirably the passing of the scene of beneficient scientific research from chemistry and physics to biology."

Pasteur was not long pursuing the study of biology before he was convinced of its wonderful possibilities, as is well expressed in the following extract from his own pen: "What would be most desirable would be to push these studies far enough to prepare the road for serious research in the origin of the various diseases." It is, therefore, quite apparent that Pasteur had quickly grasped the

importance of this science which has been demonstrated to be the most serviceable of all the sciences to mankind. One can have some conception of the keen sense of responsibility of this man from the following extract from a letter written by him to his father over half a century ago: "God grant that by my persevering labours I may bring a little stone to the frail and ill assured edifice of our knowledge of these deep mysteries of life and death, where all our intellects have so lamentably failed."

What Biology has done for Preventive Medicine

It was not until 1866 that this knowledge of the germ origin of wound infection was turned to practical account by Lord Lister in his principles of antiseptic surgery, and it was not until ten years after this again that these principles were fully accepted, the religious carrying out of which is alleged to have saved more lives than were sacrificed in all the wars of the Nineteenth Century. Following this, discoveries have been made from year to year and the individual organisms responsible for different diseases have been isolated; thus, preventive medicine has been placed on a definite scientific basis. Having been placed in possession of this knowledge, it was then given to us to determine the various ways and means by which these organisms were transmitted from one to another and to decide on the best means of control. Through the science of biology we have acquired an accurate knowledge, not only of the germs responsible for many of the diseases, but also of their haunts and habits. Through this science of biology in its broader sense, we know that the so-called criminal—whether a burglar, a murderer, a forger, or a prostitute—is, for the most part, suffering from a mind diseased, and therefore should be cared for in hospitals rather than in courts and prisons. This is true of probably two-thirds of the prostitutes in all large cities, who are in a degree mentally defective girls and who have, to a large extent, been "more sinned against than sinning". This is preventable by segregation or sterilization. While mental defectives cannot be cured, yet their reproduction can be prevented.

It is interesting to note in this connexion that one, who was neither a physician nor a biologist, but a statesman with vision, talking over the heads of his colleagues in the British House of Commons nearly three quarters of a century ago, said: "Public health is the foundation upon which rests the happiness of the people and the strength of the nation. Take the most beautiful kingdom, give it intelligent and industrious citizens, progressive

manufacturies, productive agriculture, let Arts flourish, let architects cover the land with palaces and mansions and, to preserve all these, maintain an indomitable army and navy, but, if the population of that country remains stationary, if it decreases physically and mentally, that nation must fall. This is why I say that the first duty of a statesman is the care of the public health." (Benjamin D'Israeli.)

Education the Most Potent Factor

In the first place we must sweep aside the fallacies of the, past. We must unteach much that has been taught; for instance, the abating of nuisances and the general cleaning up of a city, plumbing inspection, the collection and disposal of garbage, etc., are no longer recognized by modern departments of health as activities essential to their departments. That all this should be done in every self-respecting community, no one will question, but what we do question is whether or not they play any direct rôle in the safeguarding of human life. They constitute, rather, the ascetic side of public health work and are rarely, if ever, responsible for the transmission of disease. Offensive odours do not produce disease, but decomposing animal and vegetable matter, through affording a breeding place for flies, may constitute a condition prejudicial to public health and should, therefore, not be tolerated in any municipality.

We must concentrate on the real, preventive medicine problems. We must so enlighten the public as to the control of these diseases that they will demand that, if they are preventable, they be prevented. This done, our problem for securing the necessary sinews of war is practically solved. Obviously, then, education is a pre-requisite to efficient public health administration. We have known for the past twenty-five years or more that certain diseases are due to specific germs and that all diseases are due to some infective agency. However, it is only within the past ten or fifteen years that we have had a proper conception of the haunts and habits of these various disease-producing germs and the ways and means by which they are transmitted from one person to another. We know that these diseases are transmitted, for the most part, by personal contact and indirectly through food and drink and eating and drinking utensils which have been contaminated by contact with infected people. Here we must ever keep in mind the mild cases, the unrecognized and unreported cases and the carriers. The two most common channels by which this transmission takes

place are our water supply and our milk supply. The water supply of any municipality can be made safe by filtration and chlorination, and the milk supply of any municipality can be secured clean by means of a well organized system of dairy farm and dairy inspection, with proper regulations, rigidly enforced, but clean milk does not by any means mean safe milk. The only way by which clean milk can be made safe is by scientific pasteurization. By scientific pasteurization we mean the raising of the milk to a temperature of 145° and maintaining it at that for twenty-five to thirty minutes, then immediately cooling and keeping it at a temperature of not more than 40° until it reaches the consumer. This will destroy all disease producing germs and will not in any way affect the nutritive value, chemical composition or digestibility of the milk. Inasmuch as it is possible for any municipality to carry out this system of safeguarding their water supply and their milk supply, I unhesitatingly say that any community failing to do this is guilty of criminal negligence. Death from typhoid fever or tuberculosis is practically murder or suicide.

Next in importance is the efficient supervision and control of our restaurants, dining-halls and all places where food is handled and served for human consumption. All employees should be required to supply a certificate of health every six months, stating that they are free from any communicable disease and have not been associated with it for the previous two months. All eating and drinking utensils should be efficiently sterilized. The windows and doors of all restaurants and dining-halls should be screened so as to exclude flies. However, we cannot hope for full coöperation from the public until they are told why.

The Public must be Educated

We are, fortunately, living in an age when people no longer wish to be treated as machines. It is obviously imperative, then, that the knowledge of the ways and means by which disease germs gain access to our bodies—which has, for the most part, been kept within the precincts of our universities and laboratories—be democratized, that it be translated into language which can be understood by the man on the street and the woman in the humblest home in our city. They must be taught that the principles of antisepsis, which have done so much to control the transmission of septic infection in surgery, are the most efficient means by which we can control the spread of communicable disease. The question arises, then, how can this education be best accomplished? How

can we get this information across to the people? Many opinions have been expressed and excellent plans for educational campaigns have been suggested but we have to bear in mind that every one has to be educated, that we must reach every man, woman, and child in the nation and that we have to deal with all degrees of intellect, from the president or chancellors of our universities to emigrants who cannot read. Obviously, then, there is use for our public health bulletins, for our press notices, for our leaflets, and for our different addresses, but the thousands who cannot read and the still greater number who do not read or do not think when they do read, and consequently require this education most, can only be efficiently educated by personal contact through heart-to-heart talks in the home, which can best be accomplished by the public health nurses who are visiting the homes. The personal touch and the personal services rendered by these nurses have given them a opportunity to establish confidence in the homes, which is a prerequisite to all instructions. However, this education should begin in the schools. It should constitute a part of the curriculum of every public and parochial school. There should be health catechisms for the kindergarten and there should be proper textbooks for the higher classes. These should be reinforced by a series of talks on the various phases of public health administration by the representatives of the department of public health, and the present course of hygiene which constitutes part of the curriculum in medicine, should be extended to Theology, Law, Arts, and the Sciences, but, while this is being done in the schools and universities, we must educate the present generation in the homes. The most outstanding example we have of the possibility of efficient education in this way is that in connexion with the control of tuberculosis. The nurses attend the tuberculosis clinics and follow the patients to the home, instruct the people in the home as to the danger of contracting this disease, the danger of the spreading of it, how this danger can be eliminated and how the one afflicted can be given the best chances for recovery and, incidentally, while visiting the home they ascertain the social conditions, as to whether or not the revenue of the home is sufficient to supply proper and sufficient food, not only for the patients but for the other members of the family, in order that their resisting powers be properly maintained. The nurse sees to it that the contact cases in that home are taken to the clinic for examination, in order that they may have detected the earliest possible invasion of the disease and thereby receive treatment at a stage when treatment is likely to be followed by

success. The instructions given by the nurse in the home in regard to tuberculosis are more or less applicable to all other communicable diseases.

Additional Public Health Activities

However, when we have controlled communicable diseases, we have only accomplished a fraction of our work, inasmuch as there are many diseases that are not communicable, that are preventable or are postponable. For instance, the non-communicable diseases of infancy and childhood which are responsible in a large measure for our still unduly large infant mortality. There has probably been no other problem engaging the attention of progressive departments of health for the past five years at least, to a greater degree than that of our ever increasing infant mortality during the hot summer months. This has been the topic of earnest discussions in pediatric societies, congresses on child hygiene, and departments of public health, and yet the problem is not efficiently solved. There are, however, outstanding features upon which there is a concensus of opinion. These are—poverty. ignorance, and breast feeding—poverty with all its accessories coupled with an absolute lack of knowledge as regards the best means of safeguarding and developing the offspring properly, unitedly deal out their dreadful influence before and after birth. These observations have not been limited to recent years as evidenced from the following quotation from Shakespeare:

> "Famine is in thy cheek,
> Need and Oppression stareth in thine eyes,
> Contempt and Beggary hang upon thy back.
> The World is not thy friend, nor the World's law."

What a demonstration of man's inhumanity to man and this has been continued and handed down through the generations. However, the departments of public health, through their divisions of infant and child hygiene are bending their efforts against these foes, by educating the mothers and endeavouring to improve social conditions. If the expectant mother suffers from want, the developing offspring, wholly dependant upon the mother, is likely to be handicapped as a consequence when ushered into the world. Hence, logically, the care of the infant begins during the pregnancy of the mother, or the pre-natal period. Therefore, the general instructions of the expectant mother, both social and hygienic, to protect her against want and to improve her surrroundings, is the first

requisite. This is apparent when we realize that more than one third of the infants that die in the first year, die during the first month, and from 60 per cent. to 70 per cent. of these die within the first week, when death is therefore due to pre-natal causes. Consequently, if these lives are to be saved, it must be by more efficient pre-natal care. If we would save the baby, we must save and protect the baby's best friend—the mother. There is no other resource that the infant has, or can appeal to, comparable to the maternal instinct. With no language but the cry, the infant when in distress promptly appeals in this way, which appeal none but the mother can properly interpret. It is a well recognized fact that the infant nursed at its mother's breast has ten chances for life and efficient development to one that the artificially fed child has. Consequently, our pre-natal care must embrace not only efficient piloting of the mother through her pregnancy and confinement, but we must also see that as far as lies in our power, we make it possible for her to nurse her baby. An absolutely safe milk supply for the entire municipality is the prerequisite in an organization of infant and child welfare. This secured, the organization of well baby clinics and milk depots come next in order. The babies are examined at regular intervals by competent pediatricians as regards their weight and general physical development, and instructions given in regard to feeding, clothing, etc., by both physicians and nurses, public health nurses following the cases, when necessary, to the homes in order to see that the doctor's instructions are carried out. Our physicians and nurses are endeavouring to make it possible for mothers to nurse their babies by instruction, reinforcing the revenue of the home and proper and sufficient nourishment. The entrance of women into industrial pursuits has at times made this more difficult. However, nations are beginning to recognize their obligations and some are leading the way. For instance, New Zealand, which has probably the smallest infant mortality of any country in the world—has accomplished this by nursing premiums. The mothers are allowed $50.00 by the government for nursing their babies. It has well been said by early writers, that for the infant, "All blessings flow from the maternal fount provided by Nature," and inseparably linked up with the care of the infant is the care of the child in the pre-school age. This is the period in which, unfortunately, the children in most municipalities have been sadly neglected until they enter school, when through a properly organized system of health supervision in the schools, they are cared for. It has been repeatedly observed that a large

number of children, even though healthy in all respects at birth, become within the first five or six years, physically defective, with the consequence that municipalities through their boards of education and departments of health, are required, at no small cost, to restore these children, as far as possible, to their original state of health, to say nothing of the injustice to the child. This is not good government. The care of the child in the pre-school age should constitute a part and parcel of the duties of the organization of infant and child welfare, in all departments of health. This, when linked up with the medical supervision in the school, secures for the child the development of the best, physical as well as mental, of which it is capable, and to which every child is justly entitled.

The Influence of Industrial Diseases

Another lamentably neglected branch of preventive medicine is that of industrial diseases and industrial hygiene. Inasmuch as industrial diseases are, for the most part, preventable and industrial hygiene is essentially a part of a community hygiene, it must, obviously, come under the regime of the department of public health and the local board of health of every municipality. The term, "industrial diseases," embraces, first, the results of general insanitary conditions in factories, workshops, workhouses, and warerooms, badly lighted, overheated, improperly ventilated, ofttimes containing a dust laden atmosphere and improperly controlled heat and humidity, all of which, with the influence of fatigue, etc., tend to lower the vitality and, therefore, also the resisting powers of the body. The individual is thereby rendered an easy prey to infection which he may be daily exposed to in consequence of close contact with possibly a tubercular person or one convalescing from some communicable disease, or a chronic carrier. On the other hand, such environments only hasten on the fatal issues of these unfortunates, who are already the victims of some of the aforesaid diseases, who, through ignorance of their conditions or the dangers of their environments or through dint of circumstances, are compelled to face the inevitable.

Then we have the morbid state, consequent upon the occupation of trade, giving rise to specific disease, such as lead poisoning, arsenic poisoning, phosphorous poisoning, mercury poisoning, poisoning by fumes of mineral and other acids, wood alcohol, etc. It matters not whether a man dies from smallpox, typhoid fever, tuberculosis, lead poisoning, mercurial poisoning, or cancer, or from one of the degenerative diseases of middle life, it means a

human life lost that might have been saved, The loss to the community, to the home, and to the nation is just the same; consequently, the control or postponement of these is essentially a part of the duties of departments of public health.

Degenerative Diseases of Middle Life

Then we have the degenerative diseases of middle life, another activity that has been lamentably overlooked by departments of public health. While we have been able to reduce materially the mortality from the more acute, communicable diseases, we are confronted with the appalling fact that in the past thirty years the death rate from degenerative diseases of the heart, arteries, and kidneys has increased 100 per cent. on this continent. This is not the case, however, in England, Sweden, and other European countries. In a group of apparently normal, commercial employees of an average age of thirty years, examined by the Life Extension Institute in New York City, 36 per cent. gave evidence of disease or disorder of the kidneys, 20 per cent. had abnormal blood pressure and 13 per cent. had hardened arteries. No intelligent community or nation can afford long to disregard these degenerative diseases and their economic loss, occurring, as they do, at the period in which life is most valuable and in its most productive period. The longer old age is postponed, the more time there is to provide for it. As Metchnikoff wisely pointed out, one result of lengthening life will be a greater utilization of the accumulated experience of years. We shall have less immaturity of judgement. The principle which leads to the choice for members of the judiciary of men of ripe years and knowledge will apply to every field of human activity, even in those fields which are now preëmpted by young men because of the necessity of utilizing their vitality. This will give to society a body of men with mature judgement of advanced years, yet healthy and fit, whose opinion and worth, in consequence of mature experience, cannot be over estimated. Our disregard for middle life and the degenerative diseases of middle life, and our insane methods of living, have very materially shortened the natural limitations of human existence. The Flourens' law that a mammal should live five times its growing period would, for the most part, hold good for our lives and the lives of all mammals if they were normal, and inasmuch as man is not fully matured until thirty years of age, this would place the length of his normal life at from one hundred and twenty-five to one hundred and fifty years. There are authentic cases on this continent of men and women reaching

the age of one hundred and ten to one hundred and twenty. Metchnikoff maintained that the average old age should not at the present time be less than eighty-three years. If a business man were to look after his business in the slipshod sort of way that men look after their health, how long would that business live? Let us be sane then and be examined every six to twelve months. Pay your physicians for keeping you well and not for trying to cure one of these degenerative diseases, which come on so insidiously that they are incurable before discovered. We must remember that these diseases have no symptoms that can be detected by the patient until they are far advanced. Professor Irving Fisher, of Yale University, gave a full report of the examination of 2,000 employees, young men and young women, in different occupations in New York City: 13·10 per cent. had hardening of the arteries, 25·8 per cent. had abnormal blood pressure and 25·3 per cent. gave evidence of some kidney or liver trouble. Impairment was sufficiently important in 59 per cent. of the total number for the examiner to refer them to their own family physicians. These could all be postponed for from ten to fifteen years. Intemperance in eating and drinking, insufficient exercise, worry, the strenuous life, the mad rush for the almighty dollar—all interfere with metabolism resulting in auto-infection or auto-intoxication, and are therefore the great curative factors—these are preventable, why not prevent?

Venereal Diseases—A Public Health Problem

In our failure to grapple with the problems of venereal diseases as communicable and preventable diseases, we are confronted by another unpardonable neglect of our duties. It is the opinion of those who are in a position to judge that venereal diseases constitute the most important of all factors in the degeneration and depopulation of the world. The innocent and the guilty, the intelligent and the ignorant, are paying the penalty of an ill-considered, false modesty in terms of morbidity and mortality that probably surpasses the amount of all other communicable diseases combined. The enormous medical, social, and economic significance of venereal diseases, which are largely the result of prostitution, has never been properly appreciated by any nation. Administrators of public health can, therefore, no longer afford to disregard these diseases as an essential part of their efficient administration.

Health Insurance—A Public Health Problem

There are few problems affecting the ever increasing responsibilities of public health administrators receiving more serious con-

sideration, and deservedly so, than that of health insurance. While much is being done by modern departments of health to make amends for the failures of the past, yet much remains to be done, and we see a valuable ally in health insurance—its relation to public health is manifest. Pioneer work on this problem has been done by European nations and a bill for compelling health insurance to cover all forms of sickness and mishaps not covered by workmen's compensation is now before five or six state legislatures and is being agitated by other states. Sickness and poverty go hand in hand, the one ever producing the other, and both are oftentimes closely allied to vice and crime.

If we would have a sturdy, thrifty race, we must make it possible for them thus to develop. We have, in health insurance, an ally that points the way—a co-partnership of the employer, employee and the government.

When the Right Hon. David Lloyd George, the most outstanding character in Great Britain to-day, presented his Bill for health insurance, or, as he styled it, "Sickness Insurance," or "The People's Insurance," to the British House of Commons five years ago, among the different reasons presented by him for the Bill was one based on a statement in the House by the Right Hon. John Burns, president of the Local Government Board, that 30 per cent. of pauperism in Great Britain is attributable to sickness. On the other hand, however, it must be borne in mind that a large per centage of sickness is due to poverty. Nations are realizing more and more every year the fact that the health of the wage-earning population depends, in a large measure, upon economic conditions.

What does this economic loss mean to the 2,400,000 wage earners of Canada? According to valuable data to hand, which is based on an investigation into between 25,000,000 and 30,000,000 industrial workers in different nations in Europe and different states in the Union, the average loss of time through sickness of wage earners is nine days per year. Estimating this loss at an average of $2.00 per day and an additional cost of $1.00 for medical attendance, means for 2,400,000 wage earners of our Dominion an economic loss of over $64,800,000 per year.

A government system of health insurance can be adapted to this country, and when adapted, will prove to be a health measure of extraordinary value. The fact that under such a system the employees have such a large measure of ownership and control, will remove all elements of paternalism. The employees will then regard the benefits as rights, not charities. Adequate medical relief

will be placed within the reach of even the lowest paid worker and provide for him and his family during sickness. It will give to those responsible for conditions causing sickness a financial incentive to prevent disease. Its administration must be closely coördinated with public health agencies if it is to attain the greatest degree of success as a preventive measure.

In estimating the economic loss of the wage earners of this Dominion, no attempt has been made to estimate the loss of life, funeral expenses, or loss through partial permanent disability, consequent upon certain forms of sickness, or of the sorrow and anguish.

Furthermore, no attempt has been made to estimate the loss to the employer through physical unfitness of his employees. The conditions which give rise to the expressions—"I am out of sorts," "I don't feel fit," mean a loss of efficiency of at least from 5 to 10 per cent. Employers of labour can no longer afford to disregard such problems.

It must be apparent, therefore, that no farther reaching public health measure has ever been brought to our attention, for under its provisions it will be in the interests of both employer and employee to use all preventive measures to ward off disease since all are contributors to the insurance fund. Better health means higher efficiency. It is estimated by the public health service of the United States that 35 per cent. of the average earners of this continent must ask for public or private charity when disabled by disease. The average wage earner cannot afford to carry health insurance and when laid up is cast on the state or municipality for treatment, so that ultimately the government or the municipality has to pay the bills.

The Monetary Side of Public Health Administration

At the end of 1915 the Department of Public Health in Toronto endeavoured to ascertain what the monetary value of public health work really was, in view of the fact that, with those who have not made a study of the various problems and have not attempted to place any monetary value on human life, the expenditure of departments of public health are not infrequently questioned and the appropriation given for the safeguarding of human life, and the prevention of sickness, is, consequently, only too often far below what it should be. It was found in this investigation that the number of deaths that would have occurred in 1915, had the same death rate continued that existed in 1910, would have been 1,102 in excess of what it really was. In other words, the reduction in our death rate

from 1910 to 1915 meant that in the latter year we had 1,102 fewer deaths than we would otherwise have had.

Estimated Value of Public Health Administration

In making this estimate of the saving through the efforts of the department, different items have been taken into consideration. In the first place, the general death rate in 1910 for Toronto was 14. Therefore, the number of deaths that would have occurred in 1915 from all causes, if the 1910 death rate had continued, would have been 6,650 but, as a result of the lowering of the death rate, the actual number of deaths that did occur was 5,548. Therefore, the number of lives saved in 1915 as compared with 1910 was 1,102. The actual monetary saving of the municipality, as the result of the saving of these 1,102 lives, we have computed as follows:

Average value per life, as determined by Prof. Farr, of England; and Prof. Irving Fisher, of Yale University (all causes and ages considered), is	$1,700
Therefore the total savings in capitalized value of these lives was	1,873,400
Cases of sickness prevented (estimated as 15 for every death) meant a saving of	16,530
Months of sickness prevented (three quarters)	12,397
Cost of attendance saved	185,955
Loss of earnings prevented	309,925
The total saving effected for 1915 was found to be	2,391,320

The number of tax payers in Toronto is approximately 162,000. The increase in expenditure on public health as compared with 1910, was $216,328, or $1.34 per tax payer. The savings obtained by this increased expenditure of $1.34 per tax payer is at least $1,760,125, or $10.86 per tax payer, which means an annual profit upon the entire investment of $9.52 per tax payer.

In this estimate, no account is taken of the minor ailments—such conditions as cause a man to say that he's "out of sorts", "on the rocks," or "unfit". Such conditions, it is estimated, decrease the efficiency of that man's work from 5 per cent. to 10 per cent. and most of these conditions can be prevented by proper methods of living. It has been determined by educational associations in the United States that from 20 per cent. to 25 per cent. of

efficiency in teachers and pupils is lost through improper ventilation.

Furthermore, no attempt has been made to estimate what these 1,102 lives saved would have meant in sorrow, in anguish, in 1,102 homes in Toronto. This cannot be estimated. Only those who have passed through it can have any conception of what it means.

Nor does this take into consideration the saving effected by well-organized divisions of industrial hygiene as well as other activities along the lines of preventive medicine.

Investment in a Baby

How many parents have stopped to estimate how much money they have invested in every one of their babies by the time it is a year old and by the time it enters school? Let us roughly estimate how much the average ratepayer has invested in his baby. In the first place, his doctor's bill will be at least $10.00 and ranging from that to $100.00. In the interests of economy, he will, no doubt, employ a nurse for about two weeks, for, say, $10.00 a week and board, which would mean, conservatively estimated, $25.00. The mother's time and attention for at least three months before and nine months after birth—all of this time she could have been earning at least $1.25 a day, which, no doubt, she would, at the most conservative estimate, have been earning if she had not been raising children. This would mean approximately $375.00, so that at the end of the first year he has an investment of at least $400.00 and, in the event of any reasonable prolonged sickness and death, probably another $100.00 expense would be added—to say nothing of the sorrow and anguish, which could not be estimated in dollars and cents. And, by the time the child is ready to leave the public school, he has invested in it over $2,000.00 and by the time he is twenty-one, there will be an investment of $5,000.00 and, if he takes a university course, an investment of from $12,000.00 to $15,000.00.

This only represents the monetary investment of the parents alone. To this must be added the national value, which is not inconsiderable. We must recognize that these babies born in Canada are, for the most part, of the man timber that our men are made of who are distinguishing themselves for deeds of bravery and for endurance in France and Flanders and, in fact, all along the line, any one of which is probably a more valuable national asset than two or three of the immigrants who will be coming within our gates.

What is being done to safeguard this great investment? If the same investment were made in Holstein calves, there would be no question about the government's activity. However, it is gratifying to know that, since the establishment of the division of infant and child hygiene in connexion with the Department of Public Health in Toronto, two and one-half years ago, our infant mortality has been reduced over 30 per cent. In other words, practically one third of the dangers of the child dying within his first year have been removed. If we go back to 1910, we find that our infant mortality was 139 per 1,000 babies born. In 1916, it was 91·5 per 1,000 births. In other words, 676 fewer babies died last year than would have died if the infant death rate of 1910 had continued. This 676 represents $270,400 of an investment saved to the parents alone—to say nothing of the nation, to which every well born infant should mean at least $1,000.00. Last year there were born in Toronto 14,796 babies. This by the time they are one year old, represents an investment of $5,918.400. The amount expended in the division of child hygiene and for the safeguarding of all these little lives and this enormous investment is approximately 12½ cents per capita to the citizens of Toronto, and this represents only one of the activities of Toronto's Department of Health in safeguarding human life. And, furthermore, it represents only the monetary side, to which, with statesmen at the helm, it should not be necessary even to refer. It does not take into account what those 676 babies saved have meant in the saving of sorrow and anguish; it does not represent the fact that there were 676 fewer sorrowing mothers leaning over little white caskets in the city of Toronto alone in one year. Would this phase of the work alone not more than warrant the expenditure that is asked for the administration of the entire Department?

From the foregoing, it must be apparent that appropriation for public health administration is not an expenditure, but an investment, yielding larger dividends, many times over, than any other municipal expenditure.

Conclusion

Obviously then, modern public health administration, to be efficient, must embrace all that goes to make for race betterment, for nation building—it matters not whether the man dies of typhoid fever, lead poisoning, mercurial poisoning, syphilis, or premature hardening of the arteries—the loss to the family and to the nation is just the same, and equally preventable. The efficiency of the

people, the brains and brawn of the men and women that make up the nation, determine the strength and efficiency of that nation, whether in peace or in war, Consequently, the problems embraced in public health administration are federal—provincial and municipal. These are problems that governments must reckon with and that must take precedence to all others. Nations have long since recognized their responsibility to educate their children and have made this compulsory under the Truancy Act, and advisedly so, but for the most part have failed to recognize the obligation to safeguard the lives and health of these children and thereby secure their physical fitness. Every child has a right to be well-born and then is entitled to the development of the best, mental and physical, of which it is capable. The safeguarding and developing of the physical is even more essentially a national problem than the development of the mental, and its neglect in any nation is an economic error of inestimable magnitude. This country is spending over one million annually to educate children who die from preventable diseases before they reach the age at which they could make any return to the government for the money that has been expended on their education. This is not good government, nor is it nation building.

Pamphlet