National Health

The Nation's Greatest Asset

An Address before the Canadian Club, Halifax, N.S., January 29, 1909

By W. H. HATTIE, M.D.

Printed by Order of the Legislature

HALIFAX, N. S.:
COMMISSIONER OF PUBLIC WORKS AND MINES
KING'S PRINTER
1909

National Health, the Nation's Greatest Asset.

By W. H. Hattie, M. D.

Many years ago Disraeli said: "The public health is the first duty of the statesman." The statement was made at a time when little had been done towards the establishment of such health services as exist today in most civilized countries, and the speaker must indeed have been a seer did he realize how amply subsequent developments would justify his remark. It will be my aim to prove to you that what was true in Disraeli's time is by no means less true today, that in very reality "public health is public wealth," and that President Roosevelt's recent utterance "Our national health is, physically, our greatest national asset," is not only reasonable but easily demonstrated.

It is needless to assert that vigorous health is essential to the best performance of which any man is capable. It is a truism that what applies to the individual applies to the nation at large. And history shows that the fate of nations has largely been determined by the attention bestowed upon what we have come to term "health-problems." While we amuse ourselves sometimes in contrasting the primitive methods of past ages with those with which we are familiar, it is nevertheless apparent to the reader of history that the ancient nations showed no greater a proportionate dissimilarity in their regard for the health of the people than is manifested by the nations of today. It might be said that the degree of civilization to which any nation has attained may be fairly measured by the attention it has given to public health matters. For proof one has but to refer to the experience of the past. Simplicity of life, stern discipline and abundance of physical exercise marked the rise of many of the powers which have successively ruled the world, while departure from these rules, especially when combined with a tendency to self indulgence and moral laxity, contributed much to their

decadence. Vice favours—often causes—disease, and both flourish in the haunts of ignorance. And just as ignorance, crime and ill health contribute to produce poverty and misery in the individual, so do they prevent the advancement of a nation, not only by limiting production, but by contributing enormously to the cost of living. The problem is therefore one of the greatest economic importance, and it is my purpose to lay stress upon this phase of the question at this time.

The medical profession is often accused of doing little to better the condition of mankind. I do not propose to abuse the trust you have imposed on me this evening by entering into a defence of the profession to which I am proud to belong, but it is necessary to my argument to call to your attention some recent accomplishments in the realm of medicine. At the beginning a reference may be permitted to some statistics which have recently come from the Department of Health of New York City. These show that while in 1868 the deaths of children under five years of age in that city averaged 124.8 per 1000, in 1907 (i. e., 40 years later) this mortality had been reduced to 53.74 per 1000—that is, a decrease of 57 per cent. In that city, the deaths at all ages from all causes averaged 29.24 per 1000 in 1868; in 1907 the rate was but 18.97 per 1000, a reduction, that is, in the total death rate, of 35 per cent.

Abstract of tables of Wm. H. Guilfoy, applying to New York City (Old City).

DEATHS UNDER FIVE YEARS OF AGE, FROM ALL CAUSES–PER 1000.

	1868	1907	DECREASE.
Males	130.6	57.85	56 per cent.
Females	118.9	49.57	58 " "
Both	124.8	53.74	57 " "

DEATHS AT ALL AGES, FROM ALL CAUSES–PER 1000.

	1868	1907	DECREASE.
Males	32.12	21.13	34 " "
Females	26.52	16.53	38 " "
Both	29.24	18.97	35 " "

It is interesting to note that the female sex has profited more than the male sex by this improved state of affairs. This, of course, is as everyone wishes it to be. Some twelve years or more ago, in compiling material for a paper, I found a computation which showed that the medical advance of the preceding half century had lengthened the average life of man by two years, while the average life of woman had been increased by four and a half years. So there is this to be added to all the other advantages which the weaker sex have over their less fortunate but none the less devoted protectors.

While it is not to be denied that some very sensible and excellent public health measures date back to remote history, and while we would be far from justified in arrogating to our day and generation all that is good in hygienic regulation, it obtains in medicine as in every branch of science that very recent years have witnessed greater advance than preceding centuries. The impetus to the wonderful forward movement which I will endeavor to briefly review this evening, as far as it applies to medicine, is unquestionably the development of the "germ theory" of disease. The studies which led up to the marvellously clear and complete demonstration of the causation of certain diseases by the minute vegetable organisms called bacteria, studies with which we associate particularly the names of Pasteur and Koch and Lister, were full of importance and of interest; and, did time permit I would like to relate to you some instances illustratrative of the patient perseverance, almost prophetic foresight, and genius for overcoming difficulties, manifested by these men. But it must suffice to say that proof of the part played by some bacteria in causing disease not only suggested a means of curing, and, better, of preventing disease, but opened up an entirely new field of research and stimulated the study of the scientific branches of the medical curriculum to an enormous extent. Perhaps the first real demonstration of the bacterial causation of disease is to be credited to Davaine, a French investigator, who, in 1863 showed that a bacillus, which had already been described by Pollender, was the cause of anthrax. Anthrax is a disease which affects sheep and cattle in certain countries, and at the

time of Davaine's announcement it was particularly rife in France where it seriously menaced the wool industry. A substantial reward was offered by the French government to anyone who would discover the cause of the disease and devise measures for its control. Stimulated by patriotism rather than the hope of reward, Pasteur devoted himself to the study of the disease, and was soon able to supply what was lacking in Davaine's contentions, proved beyond dispute that anthrax was due to a specific bacterium, indicated the means by which the spread of the disease could be checked, and saved the wool industry to France.

Very soon other diseases were found to depend upon bacteria. In 1879, Hansen found the bacillus of leprosy, and in the next year Eberth and Koch described independently the bacillus of typhoid fever. In 1882 Koch immortalized himself by the publication of the results of his work upon the tubercle bacillus, of which he was the discoverer, and two years later he reported the finding of the germ of Asiatic cholera, while in the same year Loffler isolated the diphtheria bacillus and Nicolaier the tetanus bacillus. And so the work has gone on, each year adding enormously to the knowledge of the causation of disease, of the means by which diseases are spread, of the methods by which diseases may be treated and prevented. As a consequence, too, the curriculum of medical schools has been greatly modified, much more time being now devoted to preventive medicine than formerly, and because of this the laboratory equipment of an up-to-date medical college is of necessity extensive and costly. This in turn increases the cost of medical education, and so we witness the effort of a profession aiming at its own extermination by adding to the difficulty and expense of gaining entrance to it, and at the same time assiduously struggling to abolish the need for its own existence.

While the interest engendered by the work of Koch and Pasteur at first centred about the bacteria, which are vegetable forms, attention soon was attracted by some minute animal forms which were noticed in connection with certain diseases. Mere association of an organism with a disease does not, of course,

prove that it is a causal factor, and before any organism is assigned a causative role the proof against it must be exacting in its completeness. The study of the extremely small animal forms which have to do with the production of disease has been more difficult, if anything, than the study of the bacteria, but the results have been of at least equal interest and importance. These forms are especially found in diseases peculiar to warm climates, but inasmuch as the work done on them has been productive of so much good, a brief reference to them is justifiable.

One of the most interesting of these little parasites is the one which causes malarial fever. It is a very small organism, which has no difficulty in accommodating itself in the tiny mass of a red blood corpuscle—which, as you know, is a flat disc only 1/3200 of an inch in diameter and less than 1/30,000 of an inch in thickness. It is found in the blood of malarial patients, but only for brief periods which are in close relation to the chills from which these patients suffer. It undergoes a number of changes of form, and in order to complete its cycle must pass a stage of its existence outside the human body. A certain variety of mosquito, the anopheles, has been found to be the intermediate host, and this insect is responsible for the transmission of the disease. Thus is explained the prevalence of the disease in marshy and low-lying lands, where mosquitos find the accommodations they like best. The criminality of the mosquito in this connection was first proved by a body of British physicians who, under the leadership of Major Donald Ross, R. A. M. C., went to Italy in the summer of 1900, and built themselves "a mosquito-proof house in the most malarious part of the Roman Campagna. Here they lived through the fever season placing themselves under the same conditions as the fever stricken natives, except that they did not allow themselves to be bitten by mosquitos. They drank marsh water, exposed themselves to night air, allowed themselves to be drenched by the rains which were thought to be particularly active in causing this disease, and, in fact, did everything which was commonly supposed to produce the fever, yet they all remained

well. At the same time a control experiment was made. Certain mosquitos which had bitten a malarial patient in Rome were sent to London and there allowed to bite a physician who had never had malarial fever nor been exposed to it. He promptly developed the fever, and in his blood were found malarial organisms of the same type as those from which the Roman patient was suffering." (Mason). This experiment has been repeated numerous times by various investigators in widely separated places, and always with the same result. The demonstration may therefore be considered to be complete. And the result has been the adoption of the mosquito netting by which man may protect himself during the small portion of the day in which the anopheles bites, and the various measures looking to the extermination of mosquitos (notably drainage of swamps) which have effectually rid many localities of this disease.

You remember the words of Francis Bacon: "Crafty men contemn studies, simple men admire them, and wise men use them." It is the practical utility of the measures indicated by those who study preventive medicine that commends them.

One of the most striking examples of what can be accomplished by properly organized medical research is that furnished by an experience gained during the first American occupation of Cuba. You will remember that the first American governor of that Island was Dr. Leonard Wood, whose medical training was used to good effect in his administration. For more than a century and a half yellow fever had been rife in the Island, and the hygienic conditions which prevailed at the close of the war were bad in the extreme. A commission was appointed to study this fever, of which the late Major Walter Reed, of the U. S. Army Medical Corps, was president. Impressed with the work which British Army Medical officers had done in malaria, as just related, Reed was more sympathetic than others had been with a theory advanced in 1881 by an Havana physician that yellow fever owed its spread to inoculation by mosquitos. The most brilliant success attended the investigations of Reed's commission. It was demonstrated that yellow fever is conveyed

by inoculation by the bite of a mosquito called the Stegomyia fasciata, which is itself infected by biting a yellow fever patient. It was shown that the patient himself, his clothing, bedding, etc., are—contrary to a former fixed belief—not infectious, and that the disease is conveyed only through the agency of the mosquito. In fact, (as in the case of malaria) one stage in the development of the yellow fever germ is passed in the body of the mosquito, which, consequently, is necessary to the propagation of the disease. In Reed's experiments, "he used two specially constructed mosquito-proof buildings, the surroundings of which were exactly the same. In one, seven non-immune subjects were kept and required to sleep in the bedding and wear the night clothes which had been used by yellow fever patients, and had been soiled by black vomit, blood, and other discharges from these cases, some of which were fatal. In the other chamber no (such supposedly) infected articles were kept, but seven non-immune persons were exposed to the bites of infected mosquitos. In the first apartment, after sixty-three days, no cases of fever had developed; in the second, six out of the seven subjects developed typical yellow fever." (Mason.)

Thus was proven the part played by the stegomyia in the production of yellow fever. You may marvel that men would willingly submit themselves to almost certain infection by so fatal a disease. I may tell you that this is by no means an unusual thing for medical investigators to do. The list of medical men who have sacrificed their lives in the effort to discover something for the benefit of humanity is a very long one, though but few of their names have appeared in the daily papers.

Certain other facts which have come to us from Reed's commission are of interest, and show how such investigations are of importance from the economic viewpoint. Instead of the previous uncertainty as to the degree of duration of the infectiousness of yellow fever, it has been made known by these researches that the yellow fever patient can only convey the disease to the mosquito during the first three days of his illness; he is not infectious during the incubation period nor after the third day. Mosquitos which have been infected by biting a yellow fever

patient during the infectious period do not themselves become capable of transmitting the disease for a period of twelve to eighteen days--so that a community to which a patient suffering from the disease has come may be visited with impunity for at least ten days thereafter. The incubation period in the human being,—that is, the time elapsing after the bite by an infected mosquito before the development of the disease—varies from forty-one hours to five days and seventeen hours, so that one who has passed six days after having been bitten by infected mosquitos is safe from any danger of developing the disease. In consequence of this knowledge quarantine regulations have been greatly modified, much hardship and expense have been saved, and yet efficiency has been largely increased.

The wonderful record established in Cuba after Reid's discovery must still be fresh in your memory. You cannot have forgotten the sensational manner in which the campaign against yellow fever was waged in Cuba, and how in a very few months the island, which for one hundred and fifty years had been scourged by the disease, was made absolutely free from it. And then there was the second object lesson—the return of the disease after several years, when the Cubans, under self government became neglectful; to be followed by a third lesson in the second disappearance of the disease when the Americans again assumed the direction of affairs. In infectious diseases it is particularly true that "eternal vigilance is the price of freedom," and the war against them, to be effective, must be vigorous and unrelenting—no truce being permissible, and no end short of complete extermination being worth consideration.

Only a few years ago, yellow fever became epidemic in New Orleans. Do you know how the matter was dealt with? When it became evident that the local health authorities were unable to cope with the conditions, there was no hesitation about interference on the part of the federal authorities. Sickness in epidemic form does not concern alone the locality in which it develops—the whole nation to a greater or less extent is affected thereby. You business men know how quickly business suffers because of an epidemic of disease in a trade centre, and your reading

of history has informed you of how uniformly epidemics follow trade routes. So while people elsewhere sympathized with those of New Orleans in their trouble, they had no desire to import from that city a disease which in some epidemics has killed four out of every five people that it attacked, and there was prompt demand from all parts of the American South that efficient measures be instituted to eradicate the disease. Response came from the United States Public Health Service, and the conduct of the campaign was characteristic. Under Surgeon White, a corps of twenty commissioned medical officers and fifty acting assistant surgeons was organized, and this corps employed no less than fourteen hundred men in various capacities. New Orleans has a population of about 325,000 people, and those of you who have been there know that the surface system of drainage, the plan of storing water in tanks outside the houses, and the density of vegetation in many places, all greatly favour the mosquito. When White assumed control, there were two hundred cases of yellow fever in the city, and six hundred other cases had been reported before his arrival. The campaign was short, sharp and decisive, and in a marvellously short space of time the city was free from the disease and the advantage of thorough and sufficient organization had a new demonstration.

Comment has more than once been made upon the providential delay in the completion of the Isthmian Canal. You know the frightful mortality amongst those who were engaged at this work under DeLesseps, much of which was due to yellow fever. Had the undertaking been completed at the time originally intended, the short cut for navigation would inevitably have led to the conveyance of the disease to the filthy seaports of China, the Malay Peninsula and India. At present the long trip around the Horn or the Cape takes shipping into latitudes which are fatal to the mosquito, which carries the infectious element of the disease, but the canal route will keep vessels for a long time in the tropics and in the home of the yellow fever mosquito. As this insect is by no means averse to travelling by vessel, and as vessels bound for the countries I have mentioned will complete their course in warm latitudes, it can at once be

seen how dangerous the new route would be had medical science not found the means to ensure safety; and it is easy to speculate on the speed and certainty with which yellow fever would have reached these countries had the completion of the canal preceded the discoveries of Reed's commission.

An occasional newspaper item reminds us that a disease known as plague exists in some countries. You may not know that in India alone, in the year 1903, there were nearly 850,000 deaths reported as resulting from this disease, and one can only guess at the number of deaths which occurred in obscure parts of the country and were not reported. I have no complete statistics for more recent years, but in one week of 1904—that ending March 19, 40,527 deaths from plague were recorded in India, which is at the rate of more than 2,000,000 per year. It is India particularly that this disease ravages, for there climatic and geographical conditions, overcrowding, filth, and native apathy or superstitious resistance, combine to make the task of the public health service well nigh hopeless. Many of the lower animals are very susceptible to the disease, notably ducks, geese, turkeys, pigeons, sheep, pigs, dogs, cats, and—above all—rats. All these contribute to the dissemination of the disease and add to the difficulty of controlling it. Birds are doubtless accountable for the frequent outbreaks of the disease in isolated and seemingly well guarded communities. In the cities and towns the rat is suspected of being the most common carrier of the bacillus, but only indirectly by the aid of some of the numerous kinds of fleas which distribute their attentions between rats and men. Because of this belief, sanitarians in plague districts are satisfied with smaller game than that of the African jungle, and indulge in an enthusiastic, vigorous and well organized rat hunt. Some idea of the extent to which this is carried, as well as of the exhaustive nature of the studies which are being pursued is given by the fact that no less than 117,000 rats were examined at the Hong Kong Experimental

station alone, in 1903. In 1906, 5,000,000 rats were destroyed in Tokio, without, however, appreciably decreasing their number, as destruction, by lessening the struggle for existence, seemingly increases the rate of multiplication of this rodent.

The fight against this disease is, therefore, a particularly difficult one, yet marvels have been accomplished, even in places where conditions are most unfavourable. Where anything like a fair chance is given, efficient organization wins in every instance. Numerous cases are on record of prompt curtailment of the disease in large shipping centres to which the infection has been carried by commerce. The recent experience at San Francisco is illustrative.

Now while the diseases of which I have spoken have but little direct interest to us, I have brought them before you because they demonstrate the value of properly organized study. They comprise only a part of a long list of diseases of tropical or subtropical countries which have been investigated by medical men who have been especially sent by the British or continental governments for that purpose. These governments have followed this course because of the demands made upon them in the interests of trade, and thus diseases in foreign lands have been studied more thoroughly and dealt with more effectively than many of the diseases which menace the home countries. It is curious that people will habitually and unhesitatingly expose themselves to diseases which are familiar to them at home, but shrink from submitting to any risk of infection by the diseases peculiar to foreign shores. And so governments which have done little, or perhaps nothing, towards the control of diseases at home have voted large sums of money for the investigation of diseases in colonies or even in countries where their sole interest is the commercial one. While this may excite our curiosity here in Canada, it does not concern us in any other way, but we may very well ask ourselves if large expenditures abroad, on the part of other governments, is economically justifiable, should not

our own government give consideration to the possibility that a properly organized Dominion health service might prove worth what would be expended upon it? Less than a year ago, Dr. J. B. Black, of Windsor, speaking in the Canadian House of Commons, urged the establishment of a Federal Public Health Bureau. He moved "That in the opinion of this House, the time has arrived when the government of Canada should perfect organization whereby present scientific knowledge should be made practically available for the suppression of the causes of preventable diseases," and supported his motion by a strong and convincing speech. He was followed by several other medical members of parliament, all of whom spoke strongly in favour of the idea. I doubt if any matter of greater moment has at any time been discussed in our Canadian parliament.

As you know, at the present time matters relating to the public health, except in so far as quarantine and immigration are concerned, are left to the various provinces, in which the health boards of different towns and municipalities are practically independent of a central provincial board, which only exercises its powers when it becomes absolutely necessary to interfere. In consequence there is a wide distribution of authority, and, as is usual in such a case, a tendency for one district to shift responsibility upon another, which might easily prove disastrous in the event of a widespread epidemic. Moveorer, there are many matters which are scarcely of local but are of national interest which could only be undertaken by a well organized department having properly equipped laboratories, a staff of varied accomplishments, and no limitations upon its scope or authority. The advantage of a central administration of a matter which so deeply concerns the nation as a whole would appear evident, and as there already exists at Ottawa a nucleus for a national health bureau, (in the quarantine and immigration services) employing some of the best medical talent in the Dominion, it is impossible to suppose that proper action will be long deferred, and it will be one of the objects of my paper, by indicating some of the things which might be placed under its jurisdiction to show how economically useful such a bureau could be made,

and how important it might become in determining a distinctively Canadian "type" of physical and mental development.

Newholme has estimated that the average needless illness amounts to nine days per individual per year. This is surely a low estimate, and cannot include all preventable illness, such as some of the insanities. But accepting it as reasonable, and assuming the population of Canada to be 7,000,000, and the wage earning population 2,000,000, and placing the average daily wage at only $1.00 and the average daily cost of illness (i. e. physicians' and nurses' fees, medcines, etc.), at only $1.00, we find that this low estimate of the cost to Canada per year for unnecessary illness is $81,000,000.00.

Loss in wages: 2,000,000, $1.00 per day for 9 days-	18,000,000.00
Loss in Expenses; 7,000,000, $1.00 per day for 9 days-	63,000,000.00
	$81,000,000.00

While a complete discussion of all the problems which associate more or less intimately with the public health is quite out of the question in the short time available, there are a number of facts which are well worth consideration. A few of these may best be instanced by reference to some of the infectious diseases which are common in our Dominion. There was a time when smallpox was a disease with which people did not trifle. It has been more or less prevalent from very early times, spreading from place to place by trade routes, and sometimes disseminated more rapidly by armies on the march. It reached its greatest development in the eighteenth century, when it was practically universal. In England 16% of deaths resulted from this disease. Just at the close of the eighteenth century (1798) Jenner published his first work on vaccination, and so complete were his proofs of its efficiency that general attention was attracted to his practice, and by 1800 his treatment was being tried all over Europe and in America. The result was the immediate lessening of the

prevalence of smallpox. At first it was supposed that the immunity conferred by the vaccination lasted throughout life, and so when the disease began to claim victims among those who had been vaccinated, faith was lost in the practice. Then came the knowledge that re-vaccination is necessary to secure permanent immunity, and from time to time great improvements have been effected in the methods of preparing lymph and in the technique of the operation, until we now have a means by which one may with complete safety acquire all but absolute protection against smallpox. The disease, in reality, is now probably easier to deal with effectively than any other of the infectious diseases which trouble us. Its presence to-day in our midst is as unpardonable as it is unnecessary, and shows laxness in administration of our health regulations. An unfortunate prejudice against vaccination, which perhaps had some justification in the days when vaccine was not as carefully prepared as it is at present, prevails in some quarters, and is responsible for the fact that a considerable portion of the population is not protected against smallpox, except for the partial protection handed down by vaccinated parents, which may explain the mildness of the disease as we now see it. One argument offered against the practice is that it is but a scheme on the part of the doctors to extort money from the unwary. While the reasonableness of this might be questioned, I will let it pass with the remark that before the days of vaccination, Lady Mary Wortley Montague, wife of the British Ambassador at Constantinople, wrote to friends in England a description of the inoculation of smallpox then being practiced in some countries, which produced a comparatively mild form of the disease and conferred subsequent immunity. A quotation from one of her letters indicates that she had another idea than that doctors would favour inoculation because it would add to their income. She said—"I am patriot enough to take pains to bring this useful invention into fashion in England, and I should not fail to write to some of our doctors very particularly about it, if I knew any of them that I thought had virtue enough to destroy such a considerable branch of their revenue for the good of mankind. But that distemper is too beneficial to them, not to expose

to all their resentment the hardy wight that should undertake to put an end to it." Thus you see that whether the doctor favours a preventive measure or not, he must still be under the suspicion that his motives are mercenary.

Perhaps our best object lesson on the efficiency of vaccination comes from Germany. During the war of 1870-71, smallpox was prevalent in France, and French prisoners-of-war carried it into Germany, where it became epidemic in places. All the German soldiers who were under arms at the outbreak of the war had been vaccinated two years before, and these suffered much less than the general populace, who were indifferently protected, and very much less than the French soldiers. The mortality amongst those who were unvaccinated was 45 per cent, amongst those who had been vaccinated once (usually in childhood) 14 per cent, and amongst those who had been revaccinated, 5 per cent. Germany took the lesson to heart, and in 1874 passed a law making it compulsory that every child should be vaccinated before the end of the second, and that all school children should be revaccinated in the twelfth year. This law has been adhered to rigidly, and the result is that Germany has had less smallpox to contend with than any other nation. In 1899, but twenty-eight cases of smallpox were reported in the whole German Empire. These were reported from twenty-one different localities, and many of the patients were recently arrived foreigners.

German statistics are also worth consideration in connection with the claim that vaccination is dangerous. Between 1885 and 1897, 32,166,619 children were vaccinated in Germany. Of this large number, 115 died, presumably on account of the vaccination. This would indicate a mortality of about 3.5 per million, but a considerable part of those whose death was attributed to vaccination really died from other causes, and the mortality resulting from vaccination was actually less than two per million. To-day there should be no mortality whatever from this operation.

It is therefore perfectly obvious that we need have no smallpox unless we desire it. Its presence is due to certain factors, of which one is lax administration of our health laws, another is the opposition of some of the ignorant who cannot see the

utility of vaccination, another is the opposition of the superstitious who fancy that disease is sent by the Almighty and that it is sinful to oppose His will, and still another—and worst of all—is the opposition of intelligent people who, having acquainted themselves with arguments against vaccination, assume a position which only puzzles the reasonable mind but which works untold harm amongst the non-thinking class. The public health worker occupies, at best, a difficult place, and he should surely have the support of every citizen who desires the welfare of the community. It is safe guessing that he knows more about what should be done than 999 out of a thousand of those who venture to criticize him, and as it is not often that a man takes up the defence of the public health for purely selfish motives, it can be reasonably assumed that the average health officer acts upon what he thinks to be the best information obtainable.

The mildness of the smallpox which we of late have experienced has given rise to no end of disputation, and has occasioned some unpleasant and not a few serio-comic situations. In order to show you that there is a way by which all misunderstanding may be avoided, I quote an extract from an order-in-council published in a late issue of the Alberta Gazette: "Owing to the close resemblance between chickenpox and a mild form of smallpox, and the difficulty of distinguishing between these two diseases, and the rarity of the occurrence of chickenpox in a person over fourteen years of age, any case resembling chickenpox or diagnosed as chickenpox in a person over fourteen years of age shall be regarded as smallpox and treated as smallpox." Thus the lawmakers solve a difficulty which has proven impossible of solution to many medical men.

A disease which is all too prevalent throughout our whole Dominion is typhoid fever. Hygienists consider that this disease is one which could, by properly directed effort, be completely controlled. Some go so far as to say that a community in which typhoid exists stands disgraced. It is essentially a water-borne

disease, and it has for years been known that the source of infection, in the vast majority of cases, is a polluted water supply. Doubtless most people who are stricken are infected through the drinking water, but in many cases the source of infection cannot be directly traced. Thus it sometimes happens that the disease is conveyed through milk, because the dairyman has rinsed out the milk pails with water from an infected source, or perhaps the vendor may have inadvertently permitted a little such water to become mixed in with the milk. Oysters and other shellfish bred in places to which sewage gains access or stored in polluted water, have conveyed the disease to those who have feasted upon them. Vegetables grown on sewage farms have been responsible for many cases. Without doubt the common fly is not infrequently a factor in spreading the disease, by carrying the bacilli from infected materials and depositing them on foodstuffs. And dust may be another means by which the germ of typhoid may be conveyed and deposited on food, such as that exposed in the markets and groceries. But of all the means by which the disease is spread, the water supply is by long odds the most common, and whenever any considerable number of cases exist in a community the water supply may reasonably be at once placed under suspicion.

Here in Halifax we have been having considerable typhoid, and the fact has caused uneasiness, as indeed it should. We, however, have little of it as compared with some other cities—which is said by way of comfort, not justification. Montreal is just now experiencing an unusual incidence of the disease, and the good folk of that city are perturbed in spirit; but I am told that Montreal has been having more than a thousand cases of typhoid annually for years. This is just about what would be expected in a city whose citizens are required to drink the diluted but unfiltered sewage of all the cities and towns on the borders of the Great Lakes, on the streams flowing into them, and on the St. Lawrence and those of its tributaries that are above Montreal. The position of Montreal shows the need for national, or rather international, control of public health matters, for it is obviously impossible for that city to protect in any way the sources of her

water supply. The Province of Quebec is scarcely less helpless. Federal control would be effective at least as far as contamination from the Canadian cities and towns is concerned, and federal action would be infinitely more likely to meet with response from our neighbours in the adjoining republic than would be any action taken by a city or provincial health department.

An occasional case of typhoid developing in our midst causes but little concern, but it is stated that this disease costs the United States not less than $185,000,000 annually, and if we in Canada suffer in like proportion it means that we lose by it over $16,000,000 per year in mere money. In the year 1900, 35,379 deaths were recorded as due to typhoid in the United States—and of course many more were not recorded. Probably we lose in Canada not less than 3,000 of our people every year because of this disease. The outlay on account of typhoid in the British army in the recent war in South Africa approximated £4,000,000. More than 30,000 (31,118) British soldiers suffered from this disease, and nearly as many died from typhoid as from wounds received in battle. (Deaths from wounds, 7,582; from typhoid, 5,877; from other diseases, 5,149.) And yet the disease is one which we should be able to control absolutely. As has been stated by Budd, "The excreta to which all these fatal prerogatives are assigned are, on their issue from the body, entirely within our power." To prevent further contamination from water supplies, therefore, thorough disinfection of all discharges of typhoid patients is all that is necessary, but as such discharges may continue to be infective indefinitely, this disinfection may have to be continued for a prolonged period, and should be under the direction of a public health officer. To render harmless already infected water it should be either boiled or filtered. Few filters are reliable, but there are several on the market which are applicable to any house service, and which are quite efficient.

Individual effort would count for much in the fight against this, as indeed against any, disease, but, just as in the case of other diseases mentioned, organized action is necessary to good results. I could relate many instances in which signal triumph

has been achieved by such organization, but a recent German experience must suffice. Typhoid, for which the cause was not easily traced, had been prevalent in Trier for a long time, and the efforts of the local authorities at control met with no success. At last Koch, upon whom the German people have long been accustomed to depend for solution of difficult health problems, was commissioned to assume charge of the situation. He accordingly went to Trier with a corps of well trained assistants, fitted up a laboratory, and secured the co-operation of the physicians in the district. In all suspected cases examinations were made of the blood and dejecta, and when typhoid bacilli were found the patient was isolated and the premises disinfected. In this way 72 patients were found and placed under treatment, and various sanitary faults were corrected. Within three months fresh cases had ceased developing, the patients had recovered (i. e., those who did not die), and the disease was stamped out in the locality.

Could such a result be duplicated in Halifax? If so, what would the money value be?

But of all the diseases to which we are subject, that which is pre-eminently of most importance from every possible viewpoint is tuberculosis—or, as that philosopher—poet—physician, Oliver Wendell Holmes, termed it, the "great white plague." For some years a lively campaign has been going on pretty much over the whole civilized world, the aim of which is the extermination of this disease. The facts that many of the lower animals are susceptible to the disease, that the bacillus which causes it is ubiquitous and long lived, that very few escape from having the disease at some period of life, and that one can enter scarcely a public building of any kind and comparatively few homes without risking infection, make one doubt the possibility of complete success attending the attempts at eradicating so firmly established and so universally distributed a disease. Inasmuch as one may suffer from this disease for months and even

years without being aware of it, it is quite impossible to restrict communication between the diseased and the healthy, as may be done with infectious diseases of an acute nature, altho' as a matter of fact, this is quite unnecessary. So the difficulties are undoubtedly very great if not quite insuperable. Nevertheless, a wonderful degree of success has already followed the serious efforts of the health bodies of some localities, and the outlook now is far from discouraging. A few weeks ago a notable gathering of experts on tuberculosis and the problems associated with it, comprising eminent men from all over the world, met in a huge conference in Washington, and devoted three weeks to the discussion of this disease. Some of the figures presented were surely startling, but the euphemistic note was predominant, and there can be no question but that the encouragement given and enthusiasm engendered at this notable meeting will inspire the whole of mankind to such vigorous combat against tuberculosis as will quickly and very substantially reduce the prevalence of the disease.

Dr. Victor C. Vaughan stated at the Washington conference that from 200,000 to 250,000 die annually in the United States from tuberculosis, and that of these from two-thirds to three-fourths die between the ages of 18 and 45. The great majority therefore are cut off in the prime of life, and all that they might contribute to society and the state is lost. Dr. S. A. Knopf, of New York, asserts that "The money cost of tuberculosis, including capitalized earning power lost by death, exceeds $8,000, each death. The total cost in the United States exceeds $1,100,000,000.00 each year. Of this cost, about two-fifths, or over $440,000,000.00, falls on others than the consumptive. An effort to reduce the mortality by one quarter would be worth, if necessary, an investment of $5,500,000,000.00."

From whatever source one gathers statistics, the figures are appalling. Richat states that the total deaths in Europe resulting from the wars of the 19th century numbered 14,000,000, but in that century tuberculosis caused the death of 30,000,000 of people. The deaths from this cause in England and Wales number 60,000 yearly, while in the whole world they reach the

enormous total of 5,000,000 per annum. To come closer home, the mortality rate from tuberculosis in Canada probably exceeds 11,000 annually. (The census of 1901, since when the total population has increased greatly, recorded a mortality for the previous year of 9,709). And we have the statistics of our own city, where, according to Dr. Smith L. Walker, of Truro, who has been our most diligent and consistent exponent of the need for dealing with the problem of tuberculosis in Nova Scotia, informs us that for five years there has been an average of 113 deaths from this disease in the City of Halifax. If this death rate is applicable to the Maritime Provinces, there are, on an average, 2,542 deaths each year from tuberculosis, in these three provinces by the sea. And if we value these lives to the community at but $2,500.00 each (instead of Knopf's valuation of $8,000.00 each) we find that the Maritime Provinces suffer an annual industrial loss of $6,350,000 because of tuberculosis. (The census for 1901 did not give so great a mortality for the Maritime Provinces, returning only 1,674 deaths as being due to this disease. The recent increase in population would probably justify a estimate of the present annual death rate at 1,800, based on the census returns. We know, however, that it is most difficult to get accurate figures here, where the collection of vital statistics has been neglected until within the past few months, so that Dr. Walker's estimate may very well be as near the exact figure as is the census return). The long period of disability caused by consumption makes it, from the economic standpoint, the most important of all the infectious diseases.

Twenty-five years ago it was commonly believed that consumption was a hopeless disease, and this belief is still widespread. While there were occasional instances noted of spontaneous cure, these were regarded as curiosities. I believe that doubt of the invariable fatality of consumption first emanated from the post mortem rooms of some of the large hospitals, where it was found that many patients who had succumbed to other diseases showed evidence of previous tubercular infection from which recovery had obtained. In a series of one hundred consecutive autopsies in a German hospital, in no less than ninety-five were

evidences of active, latent or healed tuberculosis found. Corroborative evidence of similar character came from various sources, and one authority, a canny Scot at that, declared his belief that at some time or other every one is infected by this disease, altho the great majority get well before the condition advances to a sufficient extent to cause definite symptoms. A Canadian experience in this particular was recorded at the recent Washington conference by Drs. Adami and McCrae of Montreal, who in reviewing the last one thousand autopsies at the Montreal General Hospital found that evidences of past or present tuberculosis were present in 417 cases, or 41.7%. Of these 151 showed healed lesions and 93 latent lesions, while 172 showed more or less active lesions variously distributed. In other words, of the 1000 persons whose bodies were examined, more than 15% had recovered from tuberculosis from which they had at some time suffered, while in another 9 per cent the disease, though present, was quiescent.

Autopsy experiences have therefore demonstrated the curability of tuberculosis, and a direct outcome is the present activity in combatting the disease. We know that it is caused by the bacillus discovered by Koch and described by him in 1882. We know that this bacillus is cast off in millions in the expectoration of those suffering from the disease, and the most common way in which the disease is spread is the careless disposition of tubercular sputum. All such sputum should be so treated as to render it harmless. And as many people are undoubtedly tubercular without being aware of the fact, it is evident that all expectorated matter is to be regarded as suspicious, and dealt with accordingly. The Illinois State Board of Health has issued an exceptionally good booklet on the prevention and cure of consumption, on nearly every page of which appears in large, bold type the somewhat inelegant but pointed declaration "No spit, no consumption."

Another very important factor in the causation of consumption is lack of fresh air. Sunlight and fresh air are nature's disinfectants, and both are essential to health. Those people who fear that sunlight will fade their carpets, and who prefer a hot,

stuffy, foul smelling house to one which is bright and well ventilated, offer a standing invitation to tuberculosis.

"God lent his creatures light and air
And waters open to the skies;
Man locks him in a stifling lair,
And wonders why his brother dies."

(HOLMES.)

Nothing has been more firmly established than that the infection of tuberculosis lingers in houses which have been occupied by tubercular patients, and that to this fact rather than to inheritance is due the tendency of tuberculosis to run in families. To avoid the disease, therefore, one should not occupy such a house until is has been disinfected by someone competent to disinfect properly.

It would be as cruel as it is unnecessary to isolate patients who suffer from this disease or to deny to them the privilege of following their vocation when this would not injure them. An intelligent tubercular patient who is careful to carry out the very simple rules necessary to prevent the spread of the infection is in no way a source of danger to the community. In fact such people, by the example they set, are really a powerful factor in the campaign of education which we recognize to be so important. It is only those who are careless, either through ignorance or indifference, that are responsible for the spread of the disease, and it is upon these especially that we should impress the truth of Benjamin Franklin's words: "A little neglect may breed great mischief."

Overcrowding is a factor of prime importance, and from all quarters evidence accumulates to show that it is in the congested portions of our cities, especially when several families crowd into each wretchedly built tenement, that tuberculosis is most rife. There are quite enough other reasons to be urged in favour of the complete demolition of many squares of tenements in the city of Halifax, but the advantage which would undoubtedly accrue to the health of the city should be quite sufficient reason

in itself, and sanitarians applaud the efforts of Archdeacon Armitage, and wish him every success in his plan to provide better dwellings for the poor of our city.

Realization of the facts to which I have referred, and of others which time does not permit me to discuss, has led to a propoganda against tuberculosis which has had a wide reaching influence, and which has produced really marvellous results. There is no longer a feeling that tuberculosis is incurable, and every one of you can readily think of many of your acquaintances who have recovered from the disease or who are on the fair way to recovery. Wherever organized effort has been made, the mortality from this disease has been lessened tremendously. The New York statistics show that in forty years the deaths from pulmonary tuberculosis per 1000 of the population have been reduced 41 per cent. Dr. R. W. Phillips presented to the Washington conference a statement of the results obtained in seven Scotch cities in ten years, showing a reduction in the mortality from tuberculosis varying from 20 per cent in Perth to 40 per cent in Leith.

ABSTRACT OF DR. PHILLIPS' TABLE—DEATHS FROM PULMONARY TUBERCULOSIS PER 1000.

	1897	1901	1906	Reduction per cent (approximate)
Glasgow	20.3	18.5	15.6	23
Dundee	22.3	17.2	16.9	24
Aberdeen	16.7	13.9	12.2	27
Leith	21.2	19.2	12.7	40
Paisley	17.8	16.6	12.8	28
Greenock	20.7	14.8	13.2	36
Perth	22.1	16.1	17.9	20

These figures apply to mortality, and do not necessarily indicate that the disease is less prevalent than formerly. In the absence of morbidity statistics, which are necessarily difficult

to obtain, which are only likely to be obtained when a very perfect organization of the health service is secured, but which obviously are most necessary to a complete valuation of such work as is being undertaken in the crusade against tuberculosis, positive claims cannot be made, but there can be no reasonable doubt that the prevalence of the disease has been reduced in close proportion to the mortality from it. Our knowledge of the causaton of the disease is sufficient to encourage us to believe in its preventability. And, as our good King Edward has said, "If preventable, why not prevented?"

In the face of the results which have been obtained elsewhere, and in view of the tremendous interest which has been awakened everywhere by the recent Washington Congress and the even more recent Montreal Tuberculosis Exhibition, who will guess how much longer the people of Halifax will delay the organization of a movement for the control of this most common, most expensive and most cruel of all our infectious diseases?

There are many other infectious diseases, all of which should be preventable, which might engage our attention this evening, but time forbids. Diphtheria, scarlet fever, measles and whooping cough are more or less constantly in our midst and add materially to the death toll. All these diseases properly come under the jurisdiction of the public health authorities. Inasmuch as all are widely disseminated, it would seem that more than local action in isolated communities is necessary to their proper control, and when these diseases are considered in addition to those which have been discussed in some detail, it can be at once seen that there is ample scope for such a federal public health bureau as was advocated by Dr. Black and his fellow medical members during the last session of the Canadian parliament. But there are still other matters for the consideration of such a bureau.

Save in the case of consumption, the diseases which I have enumerated, when they do not kill, incapacitate their victims for a comparatively short time. There are other conditions, more or

less under our control, which handicap to a greater or less extent, and perhaps quite incapacitate the individual throughout life. Amongst these are blindness and deaf mutism. While, according to Eulenberg's figures, we in Canada are singularly free from blindness, making, next to Holland, the best showing of all countries studied, we would be remiss indeed if we did not strive to better conditions when possible. The last census recorded 3279 blind people in the Dominion. I will not weary you with full statistics upon this condition, but feel that a brief reference is demanded. I find that the report of the committee on ophthalmia of the new-born, presented at the last meeting of the American Public Health Association, covered the examination of ten schools for the blind (representing ten States and the Province of Ontario), and showed that 25 per cent of those admitted to these schools were needlessly blind. The studies of James L. Minor show that among the non-accidental causes of acquired blindness, 26.5 per cent are to be classed as easily preventable, while perhaps another 10 per cent might with more or less difficulty be prevented. Dr. Fraser tells me that fully 30% of the blindness which brings pupils to his school is due to preventable causes. The annual economic loss to the United States because of blindness, based on the census of 1890, is computed as nearly $24,000,000. If one third of this could be prevented, the money saving alone would thus amount to $8,000,000 a year.

As in the case of blindness, so also in the case of deaf mutism, the statistics of various countries differ widely. The condition is seemingly most common in Switzerland, where it affects 2402 out of every million inhabitants, while it is least prevalent in Australia, where but 648 per million are afflicted. In Canada, according to the last census, some 6174 were stated to be afflicted in this way. A recent analysis of 17833 pupils in the schools for deaf mutes in the United States gave 41.5 per cent as congenitally deaf, 50.5 per cent as adventitiously deaf, while in 8 per cent it could not be ascertained whether the condition was congenital or not. Another analysis of 16769 cases of adventitious deaf mutism indicates that in 66% the cause was some infectious disease—and consequently preventable. Scarlet fever stands

at the head of the list of causal factors in adventitious deafness, accounting for no less than 25% of these cases, while meningitis and hydrocephalus contribute 18%, diseases of the throat and air passages 7.5%, measles 5.5%, and so on. Infectious diseases are held accountable for 40% of the cases of adventitious deafness admitted to the Halifax Institution for the Deaf, while "sickness" (not specified) is assigned as the cause of a large additional per centage.

Besides these two great afflictions, which appeal to every one because of the deprivation they cause, many others might be enumerated. I must, however, content myself with bare reference to the effect of typhoid and of diphtheria upon the nervous system leading to a variety of nervous disorders, to that of scarlet fever upon the kidneys, causing inflammation of these organs in many instances, and to that of rheumatism upon the heart, which it often seriously cripples.

It can be seen, therefore, that the regulation of infectious diseases is important not merely because of the cost in lives and immediate expense, but because of the variety of afflictions which so frequently follow in their train.

In a paper published by the Public Health Defence League of the neighbouring republic, written by J. Pease Norton, Asst. Professor in Political Economy, Yale University, the author says; "There are four great wastes to-day, the more lamentable because they are unnecessary. They are preventable death, preventable sickness, preventable conditions of low physical and mental efficiency, and preventable ignorance." I have endeavoured to show what has been done in lessening death and illness from certain diseases, and have declared that the results are to be credited largely to proper organization. It is not unreasonable to suppose that well directed effort would be equally successful in the case of many other diseases, and in order to secure the greatest benefit to the nation, such effort should be national in its scope. Moreover the other wastes mentioned by Professor

Norton, those resulting from preventable conditions of low physical and mental efficiency, and those resulting from preventable ignorance, might well receive the consideration of a federal health bureau.

Those of you who follow the practice of reading the English newspapers will remember the difficulty experienced in recruiting the army at the time of the war in South Africa. It was found impossible to get a sufficient number of men who fulfilled the former requirements as to stature, girth, weight, etc., and it was feared that the race must be undergoing physical deterioration. The matter excited a very general discussion, which was carried on not only in the press but also on the platform and even on the floor of the British House of Parliament. An Interdepartmental Committee was appointed to enquire into the matter, and this Committee did its work with English thoroughness, and in due time presented a most comprehensive report, the gist of which went to indicate that underfeeding, overcrowding, and bad hygienic conditions combine to produce physical deterioration, and that the question is therefore essentially a medical one.

Of equal importance to, though largely correlative with, physical efficiency is mental efficiency, and on this point, too, there is much to be said. I almost fear to touch upon this subject, as its consideration enters so largely into my everyday work that I am apt to become quite too verbose when reference is made to it. Its importance, though, is so very evident that you will surely bear with me, even if I do tax your patience.

The degenerate is becoming more and more an object of solicitude. In spite of all efforts being put forth by religious organizations, moral reform associations, and other bodies which aim at the betterment of humanity, there appears to be no lessening of crime and offences against the law, while the imbecile and idiotic do not diminish in numbers, and the almost universal experience is that insanity is becoming more prevalent. Recent study of the criminal classes, and particularly the work of the Italian School of Criminologists, has shown that those with criminal tendencies are very commonly ill-developed, frequently presenting physical characteristics which have come to be termed

signs of degeneration, very often being badly nourished, and quite generally showing unusual susceptibility to disease. So there is some reason for considering the criminal to be a subject for medical study, and Sir Thomas Browne may have had ample justification for the declaration he made three hundred years ago: "I can cure Vices by Physick when they remain incurable by Divinity." (Religio Medici). Of course factors other than medical must be considered, but perhaps no better summing up exists than that of Drill, who says: "Crime is a sensible measure of the degree of health, strength and prosperity of a given society in a given moment of its existence."

The treatment of crime is just as difficult and just as unsatisfactory as the treatment of disease, and the passing thought given to the matter is not sufficient justification for the frequent criticism we hear of court methods. Justice demands the consideration of all the factors leading to the committing of a crime. In every case two factors in particular demand consideration—natural perverseness and free will. When the former of these is a predominant feature, it is common to find the individual presenting defects in physical development, and his case is, to a considerable extent, a medical one. In such an instance the exercise of the will is almost an impossibility. The greater the natural perverseness, the less good can be accomplished by punishment, and, in fact, the less responsible the culprit. Consequently many of the light sentences imposed by the court are perfectly logical, altho' they displease the public and appear to endanger the public security. The aim in the treatment of the criminal should surely be reformation, but in crime as in any other morbid condition, prevention is better than cure. I feel, therefore, that even in this field, a public health service could find opportunity for useful research.

It is hard to treat this subject briefly without endangering one's argument, but a question or two may help out. By the present system how does the culprit expiate his crime? Is it not by being housed, clothed and fed at the expense of the state? Is this not protecting the criminal against society rather than society against the criminal? And if any value at all attaches

to the work of the modern school or criminologists, should not the medical aspects of crime be given full consideration, its causes sought for and its prevention attempted? Some help comes to us from one bit of knowledge which has been acquired. It is in the slums particularly that criminals are bred. We should therefore direct our attention to the slum children—those whose parents are improvident and purposeless, and who plan nothing for their children unless it be a life of crime. Such children should be placed under healthful conditions, taught a trade if possible, and given a fair chance to make a living honestly.

Here let me quote the opinion of the eminent American anthropologist, Arthur McDonald:—"The poverty, misery, and vice of the next generation will to a large extent come from the slum children. Their need is education in habits of decency, cleanliness, self-respect, the rudiments of civilization and domestic life; their instruction should not be too abstract, nor technical in the sense of fitting them for competitive examinations, clerkship or college, but rather for the workshop, factory, trades, or the home." (Man and Abnormal Man.)

Of more purely medical interest amongst degenerates are the defective and the insane. We sadly lack in Canadian statistics bearing upon these classes, and such figures as we have are undoubtedly far from accurate. In our province, 1126 insane and defectives were under care in various institutions on the 30th day of September last, and probably half as many more were being looked after by their friends. The last report of the Commissioner in Lunacy for England and Wales shows that 1 in every 280 of the general population is insane, as compared with 1 in every 309 only ten years ago, an increase in the decade of over 10 per cent. The admission records of the Nova Scotia Hospital indicate that there has been a steady increase in the incidence of insanity—in proportion to the general population—since the hospital was opened a little over fifty years ago. Some of the pessimists think that it will only be a question of time until it will be necessary for those who remain sane to shut themselves up in asylums for safety, and turn the insane adrift. It is not necessary, however, to go to extremes in order to show

that even present conditions are very serious, and it is becoming increasingly chancy for one to be funny, For, you know, Dryden wrote:

"Great wits are sure to madness near allied
And thin partitions do their bounds divide."

Now in order to accomplish anything noteworthy by way of lessening the prevalence of mental disorder, we must know more than we do about its causation. We are, in point of fact, very much at sea with reference to this question, and can speak with definiteness only about two principal factors—heredity and poisoning by certain drugs, notably alcohol. Some indication of nervous instability is to be found amongst more or less nearly related forebears, in nearly, or perhaps quite, half of all cases of insanity, but heredity is only a predisposing factor and is not alone sufficient to produce breakdown in any considerable proportion of cases. The part it plays, however, should never be forgotten, and the individual predisposed thereby should be carefully guarded against other possible causes of insanity. Amongst these we place ill health, overstrain, worry, grief, deprivation, etc., etc. Doubtless in most cases several causes co-operate, but ignorance in this most important matter must be freely confessed. I doubt if there is any more profitable field for investigation than this one—the causation of insanity, so that here, too, work would be found for our public health service.

I have stated that we have some definite knowledge of the part played by alcohol in producing mental disorder, and, while I feel some diffidence about discussing it in detail, I think a reference to it is in order inasmuch as what applies to insanity applies also to other illnesses. Our own statistics on this subject are not complete enough to be of service, but the last published report of the New York State Commission in Lunacy shows that of a total of 6954 patients admitted to the hospitals for the insane of that state during the year ending Sept. 30, 1907, in no less than 903 (or 13 per cent) the assigned cause was intemperance in alcohol. During the five years 1902-1906 inclusive, there were

admitted to the various asylums of England and Wales an average of 10681 men and 11224 women yearly. Of these large numbers alcohol was attributed to be a causal factor in 21.9 per cent of the men and 8.9 per cent of the women. Then it is generally agreed amongst neurologists that alcoholism in a parent is responsible for many nervous disorders in the offspring. Thus the statistics of the Craig Colony for Epileptics, at Sonyea, N. Y. show that 22 per cent of 950 patients had alcoholic parents. When one considers these things, he finds a new meaning in these words of Robert Burns:—

> "Inspiring bold John Barleycorn,
> What dangers thou canst make us scorn!"

Surely the principal danger scorned is the ultimate effect of too free indulgence.

Dr. Frederick Petersen considers that 25 per cent of the 30,000 patients now under care in the New York state institutions for the insane owe their insanity to alcoholism. Estimating that these represent a loss to the state of only $400.00 per individual per year, it would appear that New York State loses $3,000,000.00 yearly through alcohol in the matter of insanity alone.

That medical men are awakening to the danger of over indulgence in alcohol is becoming more and more apparent, and I think it is a reasonable claim that no body is doing more effective temperance work than the medical profession. And this I think can be urged in spite of the argument that example is better than precept. It is the custom of some physicians to have printed on their prescription blanks a brief statement of the medical case against alcohol, and a similar practice applies, I am informed, to the labels on the medicine bottles of Paris hospitals. I suppose that I could hardly expect the support of all temperance enthusiasts if I were to advocate that the medical profession be given the control of the liquor traffic, but I verily believe that if a federal public health bureau were given power to deal with this as with other causes of disease, it would be able to do most effective work in the suppression of the drink evil.

The problems involved in degeneracy are complex in the extreme, and solution need only be expected after prolonged investigation by experts. It is not reasonable to suppose that such difficult matters will be treated in anything but the most superficial manner by individuals who have only a general interest in them. While it must be freely conceded that much of the knowledge we have of sociologic problems has come from men and women who have undertaken their study from purely altruistic motives, it is a reasonable claim that the bulk of our information has been derived in the few poorly equipped and inadequately staffed laboratories which have been established in connection with some of the universities or, in a few cases, by state endowment. The knowledge we have as yet acquired is not definite enough to be of very great practical value, yet one cannot but feel that properly directed study would lead to developments pregnant with advantage to humanity. If such study were to be pursued with the assiduity characteristic of the so called "utilitarian" investigations, what good might not be accomplished? The business man eagerly supports every investigation aimed at reducing the cost of production or at eliminating unnecessary waste. Economy is an essential to the success of any enterprise. Would it not, then, be a good business proposition to lessen the burden on the state by reducing the number of the unfit and dependent? And how are we to do this until we have thoroughly learned the cause of degeneracy and devised reasonable means of controlling it? The tendency of the time, as already stated, is to rapid increase of the dependent classes, which means additional burden to the state and consequently to the individual. Would it not be worth while putting a check upon this tendency and reversing the direction of the current? Think what it would mean if the population of our hospitals and asylums for the insane, our institutions for the feeble minded and defective, our jails, prisons and penitentiaries, could be lessened by even 5 per cent! There would be immediate reduction in the cost of maintenance, money would be released for other uses, social conditions would be improved, the safety of the individual would be increased, and an incalculable amount of human misery and distress would be averted.

All this would entail consideration of every factor influencing in any way the life of man. Heredity, prenatal conditions, environment, nutrition, education, occupation—these are but a few of the matters which demand attention. As man must be studied in the mass as well as individually, it would seem advisable that such studies be first pursued in institutions, schools, etc., over which the government exercises control, so we have additional reason for advocating that the study be undertaken by the state. And as the questions involved are to a very considerable extent medical and hygienic, it would not seem out of place to have the work directed by a competent public health service.

Comparison of results achieved by various nations in such study would be of incalculable benefit. In this way the influence of topography, climate, national ambitions, etc., upon the physical and mental development might be ascertained, and some hint might be gained as to wherein marriage between people of different nationalities would prove advantageous or the reverse. Adami, writing in Osler's System of Medicine, says:—"It is a familiar observation in Canada that the offspring of Anglo-Saxon and French marriages tend to be of better build, brighter and more active than the rest of the community, whether French or Anglo-Saxon." On the other hand, some sociological studies which have been carried on in the United States go to show that certain admixtures in that country tend to the production of relatively underweighted and intellectually backward children. Thus it can be seen how a careful study of such conditions might lead to very useful results, not only in dealing with things as they are, but in directing our immigration policy.

There is perhaps no period of life in which the opportunity of the public health servant is greater than in infancy and in childhood. The frightful mortality rate amongst infants to which we were accustomed but a very few years ago has been more than cut in half, but it still remains too high, and suitable regulation of the infant's dietary would doubtless accomplish much. We have still much to learn about the regulation of the various factors which combine to make the life of a child. We well know that the city child is physically and often mentally inferior

to the country child, while the child of poor parents is less fit that the child of well-to-do parents. And it may well be questioned whether we do right in requiring as much as we do of some of the children in our schools. Enough has been done in studying the mind of the child to make it appear desirable—or even essential to rational education—that every pupil should be examined periodically by a thoroughly trained psychologist, and that the training of the pupil should be in accordance with his prescription. If this psychologist were also a physician, the result could not but be beneficial. While such an arrangement could scarcely be applied to all districts, it could be very easily arranged in the cities and large towns, and even in the more thickly settled rural communities.

The medical inspection of schools, new to Halifax, is by no means a novelty elsewhere, and should become general. The value of such inspection lies not alone in the early detection of infectious diseases and the prevention of epidemics, but also in the early detection of constitutional diseases, so that treatment may be undertaken at the time it will prove most speedily effective. Moreover such inspection leads to the discovery of defects in the organs of special sense which, if allowed to go uncorrected, might cause much suffering and hinder school progress. and also of mental deficiency, which might have escaped notice of parents and teacher. There should certainly be no tendency to lessen the scope of the medical school inspector, and in times of epidemics of diphtheria, scarlet fever, measles, whooping cough, etc., it would doubtless prove a wise economy to increase the number to such an extent as would render possible the examination of every child before admission to the morning session of the school. This method would surely be preferable to closing the schools.

The unfortunate influence upon others of children of a neurotic or vicious temperament should be by no means forgotten, and special provision should be made for such children. It is especially desirable that those neurotics who are of a highly emotional type, and that those subject to epilepsy, should be eliminated from the regular class-rooms. It is not right that normal children

should be brought into intimate contact with these types, and it is unfair to the less favored ones to be compelled to compete with the stronger and more robust, who not only learn more readily but who are able to better withstand the unhygienic conditions which obtain in too many school rooms.

Advantage might well be taken of opportunities which offer to teach children the laws of health. I do not think that the health primers in use in our schools should be depended upon for this purpose. There can be no question that it is well to warn children against the evils which attend the misuse of tobacco and alcohol, and other narcotics, but other things of prime importance should not suffer from neglect. It should always be the aim to impress upon children and youths that they are to become the controlling factor in our national life, that their success depends upon their strength, and their strength upon their health, and their health upon obedience to certain simple rules. And as soon as the time for serious thought comes our children should be taught the laws of sex, and should be instructed upon the advantage of selecting their life partners from the strong and capable both for their own happiness and their country's good.

I fear that in attempting to cover so wide a field in so short a time I have only succeeded in confusing you by so patchy a paper, and have perhaps failed to impress you with the importance of my subject. It has been my aim to set before you certain facts which will appeal to your reason, and I have avoided any attempt to play upon your emotions in spite of the opportunity offered. I firmly believe, with the author of Religio Medici, that "a good cause needs not to be patron'd by passion but can sustain itself upon a temperate dispute," but I fear that I have demonstrated the truth of another of his axioms—"every man is not a proper Champion for Truth, nor fit to take up the Gauntlet in the cause of Verity." I have, however, ventured upon my subject for what you will concede to be a laudable reason, a sincere desire to awaken interest in a matter

which is of acknowledged importance, the conservation of the public health.

While I have argued the desirability of federal control of a matter which is of such momentous interest to the nation at large, I would not have you suppose that there should be any lessening of the activities of local health boards. On the contrary, it will always be that the principal work must be done by the local boards, and rather than a curtailment of their functions a very substantial extension thereof is most devoutly to be wished. Under ordinary circumstances the influence of a central bureau would be merely directive, as far as local matters are concerned, and it would not be expected to assume actual control except when local authorities proved unable to properly cope with an epidemic outbreak of disease. But such a central bureau could be usefully employed at all times in studying the various conditions which favour the outbreak and spread of infectious diseases; could keep local boards posted upon new developments in preventive medicine; could establish and maintain an information department, registering all epidemics (no matter how limited) and warning local boards when danger threatens; could direct and supervise investigation into the causes of physical deterioration, degeneracy, criminality, mental disorder and mental defect; could consolidate the present Dominion health services and possibly control the examination of food stuffs, etc.; and could collect and assort the morbility and mortality statistics for the whole Dominion. None of these duties would in the slightest degree lessen the responsibility or usefulness of the local boards of health, upon which we will always have to place our main reliance for the safeguarding of the community against preventable disease, and upon which must always devolve the duty of attending to the proper enforcement of the statutes in-so-far as they relate to public health matters.

And I would bespeak for the local boards the hearty support and encouragement of every citizen. There is too much criticism and too little support given such boards to-day. The weaknesses and insufficiencies of most health boards are only too apparent to their membership, and sympathetic interest and proper backing

would prove infinitely more helpful than the continual grumbling which disheartens rather than stimulates. No matter how great and how well directed the effort of any board, whether it be local, provincial or Dominion, it will fail of its purpose unless it has the approval and co-operation of the population generally. So the individual has his opportunity to do good to his fellow-man and his country by interesting himself in the great problems with which health organizations are contending, and by aiding by example, by precept, and by personal effort, in the instruction of the masses in those rules which we know will do much towards lessening sickness and rendering it more amenable to treatment.

Certain facts have been laid before you to show the wastefulness of disease. For economic reasons, therefore, if for no other we should aim at its suppression. But there are other and better reasons, and at the head of the list, perhaps, the patriotic one. What better could we wish for Canada than that it should be a nation of strong men and women—strong physically, intellectually and morally? Let us aim to establish a Canadian manhood and womanhood robust and capable beyond all other nationalities. Grant us mental acumen to enable us to grasp opportunities and make the very most of them, physical strength to endure when the strain is great, and a moral tone which will require of every man fair dealing and ensure to every man a fair deal, and what power on earth will prevent us from becoming the most truly great of all peoples? Our aim must be then, to make the Canadian stronger physically, mentally and morally, than the man of any other country, and Canadian Clubs could render our Dominion no better service than to assist in having our public health service better organized, and more liberally financed, in educating the people to the desirability of proper control of reproduction and of immigration, in discouraging all habits which lead to useless dissipation of wealth and energy, in encouraging temperance and morality, in favouring the study of the causes of degeneracy, criminality, etc., with a view to prevention, and in increasing the efficiency of our institutions for the treatment of illnesses of any kind.

Monotyped by
Wm. Marshall & Son,
Halifax, N. S.