ON PREVENTIVE MEDICINE : THE MEDICINE OF THE FUTURE.

BEING THE ADDRESS IN MEDICINE DELIVERED AT THE
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BY

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MR. PRESIDENT, LADIES AND GENTLEMEN, — When you extended to me your warm and cordial invitation to deliver this address I felt that you were asking me to undertake a task which I could only very inadequately perform; and, moreover, I felt that the burden was further weighted by the appreciative and anticipatory remark of your President when he wrote me saying: "I don't know any one who could give us a more interesting and profitable address than yourself." His expectations evidently ran high; how far these will be realized is a matter for your consideration. Personally I put the question to myself, How can I best satisfy the aspirations of a young, enterprising, and vigorous race? This is my third visit to the Dominion, and on each occasion I have addressed a Canadian audience, so I am not quite a stranger. I hope, therefore, I can claim your indulgence for a patient hearing.

On such an occasion as this it is customary for one to magnify his office, to say pleasant things, to paint the glories of the past, and depict in glowing terms for the benefit of the public what medicine has done for humanity. On the other hand, it has been said that the art of pleasing is the art of deceiving, hence I have no wish that we should hoist a high standard of righteousness or pose as the only benefactors of the race. There can be no doubt that the great advances of medical science have been of enormous advantage to individuals, and have enabled innumerable persons to survive who would otherwise have succumbed to the stress of circumstances, but how far this has been an advantage to the evolution of the human race as a whole is a disputable point. Karl Pearson says:

The very existence of human society depends upon a strong gregarious instinct having been evolved among men. Our highest human product, sympathy with our fellow men, is as much a product of evolution as the gregarious instinct of a herd of deer, or the combined action of a pack of wolves. Only it is more completely developed, and with increasing knowledge we have lost more and more touch with its instinctive gratification. The sympathy is there, ready to run riot in a thousand ways, which sober reflection may not show to be for the ultimate advantage of the herd. It is easy to give a shilling to a beggar, to subscribe a pound to a charity, or to found stipends for the blind or the deaf and dumb. Our strong instinct of sympathy with suffering has been gratified, but shall we really have contributed to the total enjoyment of the race? May be, and may be not—the pedigrees of general mental and physical degeneracy which I place before you may help you to a judgement. Of one thing, however, I feel sure, that no judgement will lead to lasting social gain which is reached by appeal to the emotions, which is based on inadequate knowledge of facts, or which collects data with the view of supporting any preconceived opinion.

The Scriptures say that it is more blessed to give than to receive, and I think I can claim, on behalf of our profession that, whether we have always been right or not, we have been ever actuated by a spirit of altruism. The process of vicarious charity, at the expense of the medical profession, has gradually grown so that in the present day at least a fourth of the population of England receives free medical advice. Why should all this charity be necessary? Why should such a large proportion of the population be pauperized? It would seem to me that it is because we are producing an inferior breed, because we are not raising up a healthy, independent race. The struggle for existence is not merely an individual question, but it is becoming more and more a national question, and the nation which produces the finest race is sure to win in the long run. As Professor Arthur Thomson says, what children usually die of is their parents, and what a nation dies of is lack of men.

In future medical men must not be content with treating the diseases of the community, they must point out the lines along which the nation is to be improved by encouraging the multiplication of the fit, and controlling the increase of the unfit. The public must be taught that the health of the nation is its most valuable asset, and that the maintenance of health is of much more importance than the treatment of disease. This departure in placing physiological processes before pathology involves a higher form of medical education than that prevalent in our medical schools of to-day—an education in which only men of the highest intelligence should take part.

"Prevention is better than cure" is one of those half-truths which readily command public acceptance as axioms which cannot be gainsaid; but it is not Nature's method, and medical men are incessantly talking about following the laws of Nature. The prevention of disease is very important to the individual, but when it enables undesirables to go on generation after generation propagating their species it can be of no advantage to the race. In an address on preventive medicine which I gave four years ago I stated that if the public were only alive to their own interests they would pay medical men liberally for directing them in the paths of truth and in the ways of health rather than for treating their diseases. If the money which is spent in the treatment of disease were devoted to the preservation of health, our huge hospitals would not be half filled, purveyors of synthetic remedies and artificial foods might find a suitable place in a home for the destitute, the necessity for surgeons and specialists would largely disappear and physicians would be fully occupied in advising their *clientèle* on the preservation of health and in looking after the aged. I am afraid we are still a long way off those halcyon days when our hospital buildings will be pointed out as relics of a decadent age; but still we should at least aim at transmitting high ideals to our successors. We can best attain those ideals by improving the stock; no environment will ever produce a genius.

Hitherto medical men have been devoting all their energies to the environment, adapting the environment to the individual, not the individual to the environment, thus not assisting the race to take care of itself. Attention, however, to the environment is absolutely essential in the prevention of disease. Although disease is Nature's method of killing off the unfit; it often severely damages those who survive, and is thus a slow and crude method of improving the race. Man has now risen superior to natural selection, and insists on living when all natural forces are against him. Medical science has succeeded in suspending the natural selective death-rate, and sentimentality renders the existence and rapid multiplication of the undesirables an easy matter. In the old countries the undesirables are increasing at a much more rapid rate than the mentally and physically fit. Those countries which have to a large extent suspended a selective death-rate, but are not wise enough to establish a selective birth-rate are certain to decay, and go the way of all the ancient nations who disappeared and made way for more vigorous races. You have got here a young country, a virgin soil, and you should see that it is peopled by a vigorous and intellectual race. You should shut out all degenerate foreigners as rigidly as you would exclude a mad dog. Do not follow our example, and make your shores a dumping ground for the rubbish of Europe. I believe you have already got a fair share of degenerates, but your population is still small, and there should be no difficulty in eliminating the unfit in the course of a generation or two.

When I was first in Canada, thirteen years ago, I read some literature about the rapid reproduction of the French Canadians, and the marked contrast in the size of their families to those in France. It was then calculated that, at the same rate of fertility, in about a century they would not only populate the whole of Canada, but would overrun the whole of North America. The Yellow Peril was not in it with them. However, I do not yet notice much change. A large number of you have not yet been pushed westward. Nature has her compensations, and this is evidently proving a saving grace to a less prolific breed. A high birth-rate is accompanied by a large infantile death-rate, and the natural increment in the population is not unduly excessive. Natural selection is still in force; the weaklings

are being killed off, and no doubt a strong and vigorous race is left behind.

The crude birth-rate for 1,000 persons living in Ireland, the Province of Ontario, England and Wales, and Scotland in 1909 was respectively 23.5, 24.9, 25.6, and 26.4. On the other hand, if we take the fertility of 1,000 wives between the ages of 15 and 45, we find that the Irish wives head the list, the numbers being: Ireland, 289.4; Scotland, 271.8; England and Wales, 235.5; and France, 157.5. I have not been able to get such statistics from Canada.*

Now when we come to the corrected death-rates at all ages for 1,000 living in 1909, we find the rate in Scotland: males, 18.56; females, 16.73; England and Wales: males, 18.37; females, 16.04; Ireland: males, 16.25; females, 16.90. In Canada in 1901, for both sexes, 15.10. In Ireland, Norway, Sweden, and Australia the infantile mortality is very low. In Ireland the death-rate for children under 10 years of age is very much lower than in England and Scotland, but it is rather higher among individuals from 10 to 35 years, and then there is a decided fall till the age of 75. Above that age the death-rate in Ireland rises rapidly, and it might look as if Ireland was a dangerous place for old people to live in, but it is simply due to the proportionately greater number of old people in Ireland. There is no evidence to show that the high mortality is due to the old age pensions.

The higher death-rate in Ireland from 10 to 35 years is almost entirely due to tuberculosis, and the lower death-rate at all other ages, except extreme old age, points indubitably to the fact that tuberculosis is one of Nature's methods of getting rid of the unfit. The wave of enthusiasm over the conquest of consumption is so overwhelming in the present day that it requires a very bold man to say a word in favour of the tubercle bacillus. Dr. D. W. Hunter, of the Royal Albert Asylum for Idiots, in criticizing a recent work on the conquest of consumption, said *inter alia*:

Many an imbecile owes his existence to the fact that his parents failed to die of tuberculosis. . . . Again, as regards insanity, the authors themselves estimate that, roughly, one in every eight consumptives is likewise insane. This tendency to consumption among the insane they explain by the lowered resistance of the soil during the attack of insanity. This may be so, but it is certainly not the whole story. While, during the last fifty or sixty years, the death-rate from tuberculosis has steadily diminished, we are, on the other hand, faced with a very ugly rise in our insane rate. Since the insane show such a marked tendency to tuberculosis, it is not improbable that the diminishing death-rate from tuberculosis has played a considerable part in the increase of insanity:

And again:

Let us take the case of the idiot. The death-rate among idiots is about ten times that of the normal population at the same age. Further, of deaths of idiots, about 80 per cent. are due to tuberculosis. Now an idiot has not even the resisting power necessary to die of phthisis. He dies of acute tuberculosis, death taking place in from three to six weeks from the onset of the illness. Surely here there is some inherited lowering of the soil. There are some 150,000 (estimated) of these defectives in England and Wales, and for every defective there are from six to a dozen of his relatives only a shade better than himself. Practically the same holds for insanity, yet we are asked to believe that a man cannot inherit a soil which will remain during his lifetime permanently below the average in resisting power.

Further:

Until we have some restriction in the marriage of undesirable the elimination of the tubercle bacillus is not worth aiming at. It forms a rough but on the whole a very serviceable check on the survival and propagation of the unfit. This world is not a hothouse, and a race which owed its survival to the fact that the tubercle bacillus had ceased to exist would, on the whole, be a race hardly worth surviving. Personally I am of opinion, and I think such opinion will be shared by most medical men who have been behind the scenes and have not allowed their sentiments to blind them, that if to-morrow the tubercle bacillus were non-existent, it would be nothing short of a national calamity. We are not yet ready for its disappearance.

These are wise and weighty words, but it would be too much to expect that they would command public acceptance, because there is nothing in the present day which people hate so much as the truth when it conflicts with popular sentiment.

Dr. Osler, in a recent lecture in Dublin on the fight against tuberculosis, said: "And, lastly, for our great con-

solation, we know that the disease is not hereditary, and for this let us be thankful." We know nothing of the kind, although we are constantly having it dinned into our ears by medical men who ought to know better. We know that the tubercle bacillus, which is a necessary element in the production of tuberculosis, is not transmitted in the germ plasma, but the long, narrow, flat chest, delicate lungs and feeble resisting power to the tubercle bacillus and to many other germs are undoubtedly inherited, just as much so as the shape of your nose or the colour of your hair. Medical men who are shutting their eyes to the truth, and encouraging matrimony and the propagation of the species by mental and physical weaklings are incurring a fearful racial responsibility, and their action should be condemned in no uncertain language.

I am in favour of the abolition of tuberculosis, because I advocate artificial to assist natural selection. Moreover, tuberculosis is a poor method of a selective death-rate compared with typhus fever, which we have practically abolished. The latter disease cleared off the weaklings without doing any permanent injury to the survivors, but tuberculosis seriously damages the survivors, is a very slow and expensive disease to combat, and many an individual succumbs who would be a worthy citizen in a better environment. By all means improve the environment, improve your sanitary conditions, which will be beneficial in preventing tuberculosis and many other diseases. As far as possible destroy the tubercle bacillus, both human and bovine, and see that the milk supply is free from such organisms. Above all, both for the prevention of insanity and consumption, discourage and prevent the propagation of the species by the mental and physical weaklings. Raise up a race which will not be catching tuberculosis or anything else.

The medical officers of health are doing an enormous amount of good work in attacking the sources of supply of the tubercle bacilli, in preventing their dissemination, in looking after the milk supply, and in improving the sanitary conditions under which we live; but your blatant propagandist must see the disease before he begins to stamp it out with tuberculin dispensaries and sanatoriums. Dr. Barendt has reckoned that in the Middle Ages there were over a hundred leper houses in England when the population was less than four millions; there were also a few such houses in Scotland and Ireland. Leprosy was stamped out not so much by the leper houses as by improvements in the habits of the people, and by a holy abhorrence of the disease, so that the lepers took little or no part in adding to the population. It was laid down as a rule that the attendants or nurses at the leper houses should be discreet women of mature age.

During the last fifty years there has been a steady decline in the incidence of tuberculosis in England and Scotland, while in Ireland it has remained about stationary. On the other hand, during the same period the insane population of England and Wales has increased 250 per cent., while the whole population has only increased 81.6 per cent., and in Ireland, with a falling population, the increase has been about 100 per cent. The ratio of the insane to the general population is in England and Wales 1 in 278, in Ireland 1 in 158, and in Scotland 1 in 266. This is not all, as there is an even greater number of mental defectives in the three countries.

If you abolish the tubercle bacillus in Ireland then it will certainly become a question of "God save Ireland." Are the insane and defective-minded to be allowed to go on multiplying at the present rate? I do not know how matters stand in Canada, but I would advise you, while showing all possible kindness to the insane and mentally defective, not to allow them to indulge in the pastime of procreation, and give them clearly to understand that with them their breed must come to an end. Insanity and mental deficiency are largely questions of inheritance, and, unfortunately, owing to cross-breeding into impure stocks, there is a latent strain of insanity and other nervous affections in a great many families, so no matter how careful you are in your selection, it will take some generations before you eliminate this latent strain from the impure dominants, but the sooner you begin such a selective birth-rate and the elimination of the undesirables the sooner you will attain a more or less perfect race. With the insane, the imbecile, the idiot, the mentally defective, the criminal, the ordinary wastrel, the loafer,

* For my Canadian statistics I am very much indebted to Dr. Peter H. Bryce of Ottawa.

the professional pauper, the tramp, the footpad, the drunkard, and other mental and physical degenerates, prevention is certainly better than cure, but you will never succeed either in prevention or cure by maudlin sentimentality.

In England and Wales there has been a great reduction in the infantile mortality during the last ten years, due to the falling birth-rate, more favourable climatic conditions, and greater care of the infants, but there has been practically no reduction in the deaths from developmental and wasting diseases, which cause 61 per cent. of the total deaths during the first three months of life. It is, perhaps, best that this should be so, as the reduction in the birth-rate has been entirely among the better stocks, and if these 61 per cent. of defectives at birth survived, the only advantage that could possibly accrue would be in finding more work for the medical profession and more scope for the charitably disposed. Prevention in these cases implies breeding from better stocks.

Of recent years there has been a considerable increase in the death-rate from pneumonia, and this, no doubt, is partly due, as pointed out by the Registrar-General of England, to a more correct certification of deaths. Many of those formerly labelled bronchitis, especially among children, being now correctly designated pneumonia. But, whatever the cause of the apparent increase, there can be no doubt that the death-rate from this disease is somewhat fearful. In 1903 in England and Wales it caused more deaths than any other form of disease, with the single exception of all forms of tuberculosis. The deaths from it considerably exceeded those from phthisis; the numbers being per 1,000 deaths, pneumonia 89, phthisis 74.6; and the rate per 100,000 living, pneumonia 129, phthisis 108. Yet we have a great outcry about the conquest of consumption, but not a word about the conquest of pneumonia. It would seem as if the ordinary individual was incapable of getting more than one idea into his head at the same time.

Pneumonia is an infective process, due to infective organisms, the pneumococcus in the vast majority of cases, though many other organisms play an important rôle in individual cases. The pneumococcus is very widely spread, even more so than the tubercle bacillus, and I feel confident a bacteriologist would find it in the mouth of every one here present. Therefore, it is as a rule a harmless saprophyte, but in a dirty mouth it may assume a virulent character, and when the resisting power of the individual is depressed from any cause, such as undue exposure, especially during sleep when the control of the nervous system is largely in abeyance, alcohol, nervous prostration, the pneumococcus readily finds its way into the lungs or blood and sets up pneumonia, or general pneumococcal infection. Pneumonia is a common disease at the extremes of life, and in the aged it is often a terminal disease—the old die as easily from pneumonia as from anything else. Like typhus fever it is a good racial disease, it kills the weakling, and, as a rule, causes no permanent injury to the survivors. The mortality is greater among males than females, and therefore in the old countries it increases the disparity between the sexes. Unfortunately it cuts off a large number of both sexes in the prime of life. The disease is short, and therefore inexpensive, so that no one makes much out of it except the undertakers, who grow fat on the misery of others. The case mortality is high, but yet no serious attempt has been made to curtail its incidence. The good lives cut short are soon forgotten. "The evil that men do lives after them; the good is oft interred with their bones." This disease is more prevalent in cities than in the country, and among those who lead unhealthy indoor lives rather than among those who work in the open.

Alcohol is a strong predisposing factor, a factor which not only increases the incidence of the disease, but also immeasurably lowers the resisting power of the individual, and so increases the mortality-rate. On the other hand, an excessive amount of lime salts in the blood greatly increases the resisting power of the individual, and so both lessens the incidence and the mortality. Any septic condition of the mouth increases the virulence of the organisms, and so a foul-mouthed individual is usually a greater danger to himself than to others. By way of prevention, the mouth should always be kept perfectly clean, and as aseptic as possible. The nasal passages and

throat should be kept clean with some simple oily preparation, such as pure liquid paraffin, as they are frequently the paths of infection, not only for pneumonia, rheumatic fever, influenza, and diphtheria, but also for cerebro-spinal fever and poliomyelitis.

Sir Almroth Wright has introduced vaccines for the prevention and cure of many infective diseases, and among the most valuable are the pneumococcal and influenzal vaccines, which, when judiciously used, are most valuable remedies in the prevention and treatment of these diseases. In apoplexy and hemiplegia the patient frequently succumbs to an attack of pneumonia, and this can be obviated by a proper vaccine. Operations on the mouth are frequently followed by a fatal septic pneumonia, and in such cases it is not sufficient to use antiseptic mouth washes, but previous to operation the pathogenic organisms in the mouth should be isolated, and a corresponding vaccine prepared. Antistreptococcal serum administered before operation is also a valuable adjunct.

Another common cause of the high mortality from pneumonia arises from lack of proper early treatment—often owing to the fact that some medical men take two or three days to diagnose the disease, and then call it congestion of the lungs, and treat it cavalierly as a matter of no great importance for fear of frightening the patient, until the unfortunate individual is too ill to be frightened by anything. In my opinion, if pneumonia were early recognized and properly treated the mortality would be greatly lessened.

In Ireland in 1909 the death-rate from pneumonia was lower than in England, being 60 per 1,000 deaths, and 99 in every 100,000 of the population.

In Scotland they move very slowly, even in the way of recording their deaths, as even now I have only been able to obtain the records of the eight principal towns for 1909. The death-rate from pneumonia was much higher than in England and Ireland, and this makes me wonder how much the national beverage had to do with the issue. The death-rate per 100,000 inhabitants was 177, varying from 217 in Glasgow to 92 in Perth; the rate per 1,000 deaths was 107, while that from phthisis was 77. In the Province of Ontario in 1907 the death-rate from this disease per 100,000 population was 138, and per 1,000 deaths, 91.

Bronchitis holds the second place as a cause of death in England and Wales, the numbers in 1909 per million persons living being 1,142, against 1,290 for pneumonia and 1,081 for phthisis. There has been a considerable diminution in the apparent incidence of the disease, partly owing to proper transference to the pneumonia list. Bronchitis is still very prevalent and fatal at the extremes of life, consequently the young and the old should be well protected against atmospheric changes. Some persons are much more susceptible to bronchial catarrh than others; this susceptibility is much lessened by a fair amount of lime salts in the blood, and increased by the salts of sodium and potassium, but in cases of true asthma the very reverse appertains. Alcohol and tobacco are injurious to the throat and bronchial mucous membrane; and the chronic cough thus induced is a frequent source of emphysema. A suitable vaccine is often highly beneficial in acute and chronic bronchitis, but there is no vaccine to counteract the effects of alcohol and tobacco. All destructive processes of the lung tissue cause emphysema. Senile emphysema is an atrophic process due to want of exercise of the lungs, associated with ossified costal cartilages; this can often be obviated by decalcifying agents and breathing exercises.

Pleurisy, again, is largely an infective but not a specific disease, as it may be associated with tubercle bacilli, rheumatism, pneumococcus, pyogenic organisms, typhoid and colon bacilli, etc. In its prevention and treatment we must avoid undue exposure and all depressing influences, and consider the infective organisms.

Since 1870 there has been a marked fall in the death-rate from small-pox, typhus, and enteric fever. Every person can be protected against small-pox at a very small cost; sanitarians have practically abolished typhus fever, and the incidence of enteric fever is and has been steadily diminishing, but we have still got to deal with some of its associated causes. The ordinary household scavenger, the domestic fly, is still a troublesome pest, and the human carrier usually causes a good deal of mischief before

discovery, and when discovered is difficult to control. The milk supply is still a frequent source of local epidemics, but the water supply is generally above reproach except in rural districts. A few epidemics have been traced to ice-cream vendors. The erroneous dread of sewer gas as a direct cause of the disease is now a matter of ancient history, except in the law courts, where it still does duty.

In the army Sir Almroth Wright has been fairly successful in lessening both the incidence and mortality of this disease by his vaccine, but in all campaigns thorough sterilization of the water is the most important method of prevention. Other matters must not be neglected, such as the disposal of the excreta and the protection of the food from infection by flies.

In diseases which largely affect children, such as measles, whooping-cough, diphtheria, and diarrhoea, the improvement has not been so marked, except in diarrhoea, in which, during the last few years, the incidence has fallen owing to favourable climatic influences. In scarlet fever where isolation is pretty universally adopted there has been a great fall both in the incidence and mortality. Although there has been quite a revolution in the treatment of diphtheria and consequently in the case-fatality, I am afraid sanitarians have not done their share in lessening the incidence of the disease. It will be very difficult to prevent the spread of infectious diseases among children so long as we have overcrowding, defective ventilation, dust, and want of cleanliness in the homes, schools, and public conveyances. However, a great deal can be done for local conditions by looking after the children's teeth, by seeing that their teeth and jaws get plenty of exercise in chewing food, by keeping their mouths and nasal passages as aseptic as possible, and by removing any obstructions, such as adenoids and large tonsils.

During the last forty years in England and Wales the number of deaths due to venereal diseases has fallen from 92.6 to 4.8 in the 1,000,000 population. So far as these statistics are reliable, they seem to me to point to a great improvement in the treatment, as there is no reason to believe that there has been any diminution in the incidence. These diseases, from their deteriorating effects on the race, merit the attention of a statesman. A determined effort should be made to stamp them out, notwithstanding the pharisaical hypocrisy of the unctuous and righteous, who compound for sins they are inclined to by damning those they have no mind to. The suffering caused to innocent wives and children by those diseases call aloud for their elimination. With a combined international effort they might be stamped out.

What can be done by well-directed legislative measures in stamping out disease is well exemplified by the muzzling order of Mr. Walter Long (to whom the country has never shown sufficient gratitude), as there has not been a case of hydrophobia in Great Britain or Ireland for the last fifteen years.

In England and Wales in 1909 there were 914,472 children born alive, and there were 1,429 mothers who died from septic diseases associated with parturition; there were also 3,171 women who died from diseases caused by or associated with pregnancy and child-bearing, but who had not produced viable children. The net result is that 1 woman died for every 199 children born alive. A large number of these women should never have been pregnant, and many died from preventable diseases which were not prevented. There is plenty of scope here for prevention, not only in advising women not to undertake risks which will prove their deathblow, but also by saving valuable mothers from septic infection. This can be easily accomplished by a little trouble before parturition in attending to the health of the mother, and if any pathogenic organisms are found in the *via naturalis* an appropriate vaccine should be administered previous to parturition. I know an ophthalmic surgeon who will not do a cataract operation until the conjunctival sac has been prepared and a bacteriologist pronounces it free from microbes. Why do gynaecologists not undertake somewhat similar precautions in the case of the parturient woman? The vaunted aseptic gynaecology of which we hear so much is not sufficient; there may be a breakdown in the technique, and, moreover, the germs may be there before the arrival of the aseptics.

The practical disappearance of erysipelas from hospital wards must largely account for the lessened death-rate from this disease. We must give the surgeons due credit for this diminution; in fact, I would like to give them the whole credit, as, so far as preventive medicine is concerned, very little can be placed to their credit. About the only diseases which they attempt to prevent are those which spoil their operations—erysipelas, pyaemia, and septicaemia. The surgeons largely live on the failures of the physicians and general practitioners, and I hope they will not take any umbrage at what I say here and in other parts of this address. They can, if they choose, put down my remarks to envy, jealousy, and all uncharitableness, but I shall not acknowledge any malice. I intensely admire their work and envy their fear, which are, like the falls of Niagara, magnificent.

In regard to rheumatic fever, there has been during the last forty years a marked fall in the death-rate, which appears to me to be more due to improved methods of treatment than to any lessened incidence of the disease. Although rheumatic fever is not very fatal, yet when we take into account that it is the chief cause of heart disease in the young, it must be looked upon as a terrible disease. Every child with rheumatic hereditary tendency should be well protected against wet and cold. Every affection of the nose and throat, and, in fact, the whole digestive tract, should receive immediate medical attention, as it is through these pathways that the rheumatic poison or organism is introduced. Immediately on the slightest appearance of this disease the milk and carbohydrates, which are apt to undergo acid fermentation, should be cut off, and red meat, which supplies ammonia to neutralize the sarcolactic acid in the muscles, should be freely given. For flushing out the system there is nothing better than hot water, but the water should not contain much lime. In order to save the valves of the heart, the citrates of sodium and potassium should be freely administered. As specific treatment the salicylates still hold their sway, the vaccine treatment being still in its infancy. Parents who transmit a hereditary tendency to rheumatism to their offspring have a serious responsibility which they cannot honestly transfer to Providence, and therefore they should themselves exercise a provident care over their children. There is no necessity for coddling, but the children should be adapted, or rendered adaptive, to the environment; cold sponging every morning, sufficient to induce healthy reaction, has a good protective influence. Fresh air, exercise, sufficient clothing, moderate diet, especially in carbohydrates, and general attention to the digestive tract are all necessary.

Diseases of the blood vessels, heart, and kidneys are on the increase, no doubt largely due to greater wear and tear, more worry and anxiety in life. From these three diseases, including cerebral haemorrhage, the death-rate per million living in 1909 was: In England and Wales, 2,708.4; in Ireland, 3,170; and in the eight principal towns in Scotland, 3,234; in Ontario, in 1907, 2,172. If these deaths occurred among the wasters, it would perhaps not matter much, but this mortality to a large extent occurs among the most hard-working and most energetic men and women in the prime of life, from 35 to 65 years of age. One often hears patients say that they have never been ill a day in their lives, when an examination of the heart, kidneys, and blood vessels shows disease of fifteen to twenty years' standing, and the tenure of life reduced to a few years at most, and yet many of these conditions were preventable. Of course, many a man may prefer to lead a very active and short, but to him enjoyable, life rather than drag it out to an inordinate length. It is only with healthy blood vessels that any one can hope to retain his mental and bodily vigour, and expect to attain to a green old age. I know that there is another view of life, and that many men do not consider old age desirable. When man has ceased to be a productive agent, intellectually or physically, they look upon him as a mere cumberer of the ground—an obstacle in the path of progress which should be removed.

Diseases of the heart, in the vast majority of cases, arise from causes acting on the periphery, and by preserving healthy blood vessels—an end very easily attained if people were content to be intelligently directed—one can prolong a healthy and vigorous existence for many years. I have delivered several addresses on arterio-

sclerosis and allied subjects dealing with the prolongation of life, but I cannot enter into these matters here, as they would require several hours for their exposition. However, I may say that the lime salts play a very important rôle in these diseases, and some excellent work on calcium metabolism and diseases of the blood vessels has been done in Montreal by Oskar Klotz, Professor Adami, and others.

With many authorities it is not the popular method to anticipate disease; they prefer to get hold of a case of heart-block, cardiac arrhythmia, or angina pectoris, and then they can make something out of their cases in more senses than one. But I want to educate the public into the habit of taking an interest in their own health. We have here got a large field for preventive medicine, but it is very difficult for a practitioner to prevent disease when he is not consulted. To my mind it is very deplorable to find many of the ablest men of the day cut off in the prime of life and vigour of manhood from disorders of the circulation, which are much more easily prevented than some of the so-called preventable diseases. The distinguished man who coined the expression, "If preventable, why not prevented?" himself died of preventable disease.

In England and Wales the mortality from all forms of malignant disease has steadily risen since 1860 to 1909—in the male population from 210 to 826, and in the female population from 480 to 1,071 in the million living. In Ireland the earlier statistics were not very reliable, but in 1909 the death-rate to the million living was only, among males 750, and among females 850. In the eight principal towns of Scotland the rate for both sexes was 1,073, and therefore higher than either England or Ireland. In Ontario in 1907 the rate was 626. In England, where tuberculosis is steadily declining, cancer is just as rapidly increasing, and in Ireland both diseases are rather stationary, but the cancer death-rate is 9 per cent. lower among males and 11 per cent. among females than in England and Wales. So the higher tuberculosis death-rate in Ireland has its compensations. There have been in recent years great improvements in the surgical treatment of malignant diseases, and we are getting a little nearer the solution of the problem of their nature and prevention, but not quite so near as some would have us believe. Even now a great deal can be done towards their prevention. If all sources of constant irritation, internally and externally, were removed, the occurrence of these diseases would be frequently obviated. Metchnikoff says: "Stagnation is a familiar cause of disease, and is the probable cause of the frequency of cancer of the stomach." Its selective sites in the large bowel are those where there is stagnation and irritation. In cancer there is increased alkalinity of the blood with a diminution in the amount of free lime; the same condition may appertain in the tissues, but not, as a rule, in the same degree, as the lime taken up by the blood from the intestinal mucosa may be partly discharged into the tissues in the process of elimination. Recently Professor Benjamin Moore and his coadjutors have shown that the deficiency of free HCl in the stomach occurs no matter where the cancer is situated.

Myositis ossificans traumatica is a comparatively rare affection, and I should scarcely have considered it worthy of attention here only for two papers in a recent issue of the *Lancet* by two eminent London surgeons. These gentlemen have a good many conjectures as to the nature and causes of this affection, and, largely on the strength of skiagrams, these calcareous masses are spoken of as "bony," and microscopically said to be of the nature of cancellous tissue. They have not a single word about the amount of lime salts in the blood; and surely in the present day there is no justification for ignorance on this subject. When there is an excess of lime in the blood there is no more mystery about its deposition in an injured muscle than there is in a damaged artery. As in the artery, so in the muscle, the lime is deposited in the form of a calcium soap, and afterwards the fatty acid is replaced by carbonic and phosphoric acids; we then get a hard calcareous plate. These masses often disappear spontaneously when the calcium content of the blood, falls. The proper preventive and curative treatment is to see that there is no excessive amount of lime in the blood by regulating the diet, and the use of decalcifying agents. Massage and exercise of the injured part prevent the

deposit, and hasten the elimination of lime from that region. It is less difficult to hasten the absorption of lime deposited in a muscle than to get rid of that in rigid costal cartilages, yet the latter feat can be accomplished with a little patience and trouble.

The failures of physicians and practitioners in the prevention and treatment of diseases of the digestive tract have provided a rich harvest for the surgeons, who, buoyed up with their successes, would now like to appropriate the whole region to themselves. I would advise them to make hay while the sun shines, for fear that the millennium should arrive sooner than they expect. Already the dawn of a new era is breaking forth, and under prevention there will not be much necessity for surgical interference.

I need not say anything about septic diseases of the mouth, which are well recognized by our profession, but unfortunately the public do not often recognize their danger, otherwise we should not see so many cases of pernicious anaemia.

A comparatively simple affection which occasionally occurs during the first few weeks of extrauterine life has been dubbed with the high-sounding title of congenital hypertrophic stenosis of the pylorus. There have been a great many learned disquisitions as to its nature and treatment by physicians and surgeons attached to children's hospitals, and now they are busily engaged trying to settle the question as to whether the treatment should be medical or surgical. This would be very amusing were it not for the fearful mortality which accompanies the efforts of both. The explanation is too simple to have attracted the attention of those gentlemen, and the explanation is simply that it is not congenital, but is due to an excessive amount of calcium in the stomach walls, and especially in that portion of the walls—the pylorus—which contains relatively the most muscular fibres.

If it were more generally recognized that even a minute trace of a soluble calcium salt produces a marked physiological effect on involuntary muscular fibre, not only would pyloric spasm, but a good many enterospasms, be more readily explained. No doubt a growing infant requires a good deal of lime, but even it can have too much of a good thing, and when a series of overdoses are concentrated in a particular organ the result is not what could be desired. The amount of lime in human milk varies considerably, and is apt to be greatest in the early period of lactation; moreover, the mother may be unnecessarily fortifying this secretion by herself drinking large quantities of milk and taking other articles of diet containing lime. In an unpublished thesis G. Claude Scott has shown that cow's milk contains five to six times as much lime as human, but in cow's milk, of the total lime, 72 per cent. is combined with the protein and 28 per cent. free, while in human milk only 44 per cent. is combined and 56 per cent. free. Moreover, the combined calcium in human milk is much less stable than in cow's milk. In such cases, when the infant is being fed on cow's milk, the milk should be stopped for a time, or at least it should be well diluted, citrated, and boiled some time before using. It is even better to add to the diluted milk a small amount of the citrate and about double the quantity of the bicarbonate of sodium, a mixture which not only splits off some of the fixed lime, but renders the free lime more insoluble. The value of the mixture is further enhanced by the addition of a minute quantity of an active potassium salt, such as the chloride, which hastens the relaxation of unstripped muscular fibre. The milk should always be boiled. When the infant is being fed at the breast we must get rid of the excess of lime by decalcifying the mother. This can be readily accomplished by cutting off for a necessary time all articles of diet containing lime, and by giving her a liberal allowance of such drugs as citrate and phosphate of sodium, lemon squash, etc. A teaspoonful of olive oil to the infant will have a more soothing effect on its stomach than a surgical operation. An opiate is often necessary to relax the spasm of the pylorus. Perhaps these cases would be much more common than they are only for the fact that infants vomit very readily without much apparent cause.

Gastric ulcer frequently occurs in young women after the establishment of the menstrual function; they become anaemic, suffer from constipation, and there is not only a deficiency of iron, but also of lime in their blood. By the

way of prevention, the calcium and magnesium salts are highly beneficial.

You do not often find a surgeon foolish enough to contract the fashionable disease, appendicitis. I believe in the United States you are not considered respectable if you have not had it. Personally I have never qualified for that mark of respectability, and I do not intend to do so. I am of opinion that if people were not so fond of keeping a cesspool in their interior the *Bacillus coli* and other organisms would not become virulent, and appendicitis would be a comparatively rare disease. A lady of a religious turn of mind once told me that she quite agreed with me on this point, "as man is a veritable sink of iniquity." A *Bacillus coli* vaccine is often useful in treatment.

I know a physician who considers himself a great authority on mucous colitis, and who freely prescribes milk; he might as well prescribe sandpaper. In these cases the insoluble lime soaps, especially those of stearin and palmitin, are very irritating to the large bowel. In such cases the blood often becomes deficient in lime because it is being rapidly excreted by the bowel. However, all insoluble lime preparations must be strictly avoided, also saturated fats, such as beef and mutton fats. Unsaturated fats, such as olive oil, cod-liver oil, butter, cream, and bacon gravy, can be freely used. Whatever lime is given must be administered in a very soluble form, such as the iodide or the glycerophosphate. In obstinate cases an examination of the flora of the intestine, and the administration of a suitable vaccine will prove useful. This disease is fairly amenable to judicious treatment, even without the assistance of the surgeon, and it is one which can be prevented. Some years ago there appeared in the *Lancet* a paper entitled "The Cause of Colitis, with Special Reference to its Surgical Treatment." This is the surgical and business way of looking at the subject. A less astute individual might have studied causation with a view to its removal and the prevention of disease. However, in the present day the public only pay for treatment, and have no right to any choice.

It should be worthy of the attention of surgeons and general practitioners to try and find out the cause of enlargement of the prostate gland, which not infrequently renders the lives of old men miserable. The surgeon may say, Remove it; but I would say, Find out and remove the cause, so that the necessity for the removal of the gland may disappear. This affection is not much in my line of work, but recently it has appeared to me to be at least associated with an excessive amount of lime in the blood and tissues. This is probably not the sole cause; there is likely some local irritation or some interference with functional involution; but I feel fairly confident that an excessive amount of calcium is an associated condition—a condition which has sufficient determining effect in stimulating hyperplasia to merit its removal. I have noticed the occurrence of this affection in men who have led exemplary lives, who have not considered wine the milk for old age, but who have preferred that from the cow. In these men I have found an over-supply of lime with deficient calcium metabolism, rigid costal cartilages, and calcareous deposits in the arteries.

The presence of lime is necessary in most glands of the body for the proper exercise of their respective functions, but when such glands as the female breast and the prostate in the male should cease to functionate and take on a process of involution it is not unreasonable to suppose that an excessive, and then unnecessary, amount of lime, especially when the blood is very alkaline, may play some part in the adenomatous growth or inflammatory hyperplasia which then occasionally takes place. Chronic mastitis, perhaps, most frequently occurs in single women the function of whose breasts has only been potential, but it is not the lime which is excreted either in milk or in the prostatic fluid that can work any mischief; in fact, the excretion of lime into the tissue of a diseased gland may serve as a cure. Moreover, the exercise of the function of the prostate is often protracted and its involution delayed. I have seen a large prostate and lively spermatozoa in a man over 80. If these suppositions be found correct, then the lines of prevention become more obvious.

Before concluding, I should like to say a few words on the last phase of life, old age. In 1909 the number of persons dying from old age per million persons living was

in England and Wales 948, in the eight chief towns of Scotland 411, and in Ireland 2,029. In the latter country there were 192 males and 231 females who died at the age of 95 years and upwards. This does not speak badly for Irish longevity notwithstanding tuberculosis. In the whole of Canada in 1901 the rate was 1,115, and in Ontario in 1907 it was 1,180. This is better than Great Britain, but not much more than half the rate in Ireland.

I am not going to tell you how to prevent old age, most people are fairly successful on that score. I only propose to do a little soliloquizing—I do not know that I have ever met any one who really considered himself old. I once knew a physician of about 80 who was called in to see a professional brother about 20 years younger. At the consultation the old physician said about his younger colleague and patient, "After all, you know, he is getting an old man." Age is a very relative term, like heat and cold, and its importance somewhat depends on how the popular breeze is blowing. We do not exactly know in the present day what to do with our old people. We have not put Metchnikoff's idea as to their employment into practice, neither have we established Professor Osler's lethal chamber. There are some people who live too long for their reputation's sake. As I said on a previous occasion, a man cut off in his prime may be handed down to posterity as an intellectual giant, whereas if he had existed till his cerebral arteries became sclerosed, and he had become slow of thought and speech, or tended towards drivelling dementia, much of his former glory would have waned, and the memory of him would pass quickly into oblivion.

I am not now so much concerned with the prolongation of life as with the preservation of health—a sound mind in a sound body, the former can barely exist without the latter. We are not concerned with any useless attainment of longevity, but with the prolongation and efficiency of life. We are concerned with the efficiency and manhood of the nation. When a life ceases to be efficient it can retire into obscurity, or be withdrawn from circulation, and receive an old age pension. Paul Bert said about the aged: "They deserve congratulations, care, and consideration, but the prolongation of their lives does not demand any special solicitude from society." Paul Bert died comparatively young, perhaps if he had lived longer he would have modified his opinion. Since then we have humanely, and I think wisely, become more solicitous for the well-being of every one.

Ill fares the land, to hastening ills a prey,
Where wealth accumulates and men decay.

Whatsoever thine hand findeth to do, do it with thy might;
for there is no work, nor device, nor knowledge, nor wisdom, in the grave, whither thou goest.

THE Italian Society of Internal Medicine will hold its twenty-first congress at Turin in October next (9th to 12th). The subjects proposed for discussion are progressive pernicious anaemia, the diagnosis of diseases of the pancreas, visceral arterio-sclerosis, and intravenous medication.

A HOSPITAL for twenty-four patients was opened in Great Malvern on May 29th, the funds for its erection and equipment having been provided by Mr. C. W. Dyson-Perrins. All accommodation for patients is at ground-floor level, and the building throughout is of the fireproof type. It is an open site in Lansdowne Terrace, and plenty of balconies have been provided. The architect was Mr. W. Henman, F.R.I.B.A., of Birmingham.

DR. JOHN GREASLEY, of Canterbury, was the recipient on May 29th of an illuminated address and a centenary jewel from the local lodge of Oddfellows, of which he is a member and which he has served as medical officer for some thirty-four years. There was handed to him at the same time an album containing the names of the subscribers to the testimonial, who numbered upwards of a thousand. The member of the lodge by whom the presentation was made said that it was not in his power to over estimate the work their surgeon had rendered to the order. There was no member of it who could not express his gratitude to Dr. Greasley for his kindly services in the cause of humanity, and they hoped he would be spared many years to continue his great work. In acknowledging the presentation, Dr. Greasley said that changes were taking place which they had never anticipated, and he hoped the National Insurance Bill would accord more generous treatment to the medical profession than was promised therein.