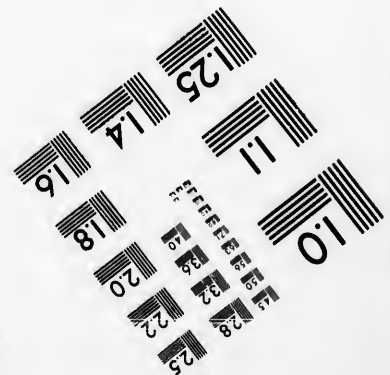
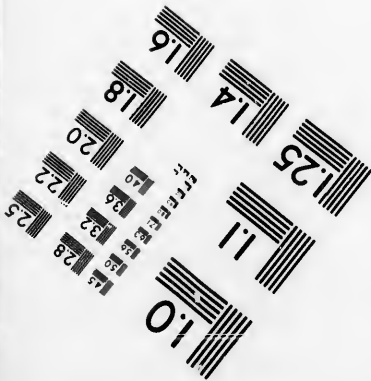
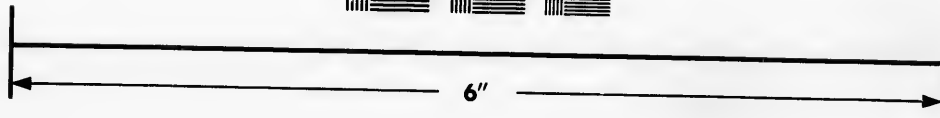
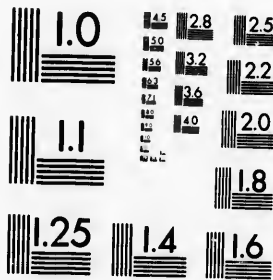


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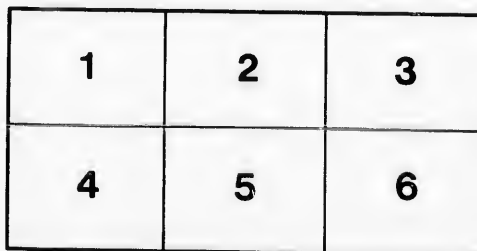
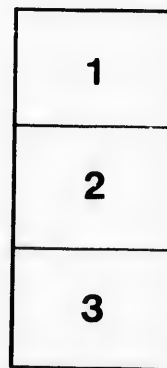
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THE ADDRESS IN MEDICINE.

Delivered at the Annual Meeting of the Canadian Medical Association, held at Kingston, Ont., August, 1893.

By EDWARD FARRELL, M.D., Halifax.

My first duty is to thank you most cordially for permitting me to take the place I occupy to-day. To give the address in Medicine, and at the same time to take the place of one so well qualified to fill it, is no easy task. Were it not for the earnest solicitation of your honoured president, my old friend Dr. Bayard, I would hesitate to take this post of honour among you.

The first thought that occurs to me is,—what grand strides the science of medicine has made in the last quarter of a century. When a traveller comes into a new country where the scenery is beautiful, he is charmed by the first sight of its beauty, and as he goes further on he is equally delighted with each new landscape that opens up to his sight; his mind does not dwell upon any one beautiful picture in his view, he is simply lost in admiration of all the scenes he witnesses, and fails to see the dominant magnificence in any part. So it is with the busy doctor in his daily round, he is so impressed with satisfaction and pleasure in the results of his work; for what can be more pleasant or satisfactory to an educated man with the soul of a gentleman than to have done good—to have brought health, vigour and useful life to his fellow-man. He is so impressed that he does not see in all its fulness the increased power that science is giving him day by day to produce the better results he is able to obtain. None of us have a full conception of the mighty work the science of medicine has accomplished in the past few years. How much our knowledge has increased! In how many things has certainty taken the place of doubt! So much that was hidden has been made plain to our view! How much more pride we should take to-day in the profession of medicine than we ever did before! In recognizing the great increase in our knowledge in the past quarter of a century, while we feel a thrill of pride at the results of the splendid work of these great scientists who have during this short time almost revolutionized the science of medicine, still we must not forget that their work would not have been possible but for the labours of those who preceded them. We naturally associate the great names of Pasteur and Koch with the inception of the discoveries in microscopic life and its influence upon diseased processes. These labourers have opened up to us an unseen world of life, microscopic germ-life, whose function it is to

influence the greater life of man for good or evil as to his physical existence. Still it does not detract from the genius of these great discoverers when we say that they only worked out and made manifest facts in the etiology of disease that were suspected by some observers and believed in by others many years before their names were known to the world.

There are two methods of investigation into the nature of disease which were carried out with much activity during the decade preceding the origin of the germ theory. I refer to clinical observation and the study of morbid anatomy. The labourers in these two great fields of research prepared the way for those who are now developing the newer fields of investigation. Close observation of disease at the bedside, carefully noting by eye, ear and touch the varying changes that accompany its progress, has been and is still a great factor in the growth of the science of medicine. And, again, to be able to observe the changes wrought by disease in an organ, in the *post-mortem* room, gives us positive knowledge. That which we believed, expected or conjectured at the bedside is made plain when the diseased organ or organs are under our eye and touch. It is to morbid anatomy that we owe our first positive and accurate knowledge of the nature of disease, and it soon became the groundwork of a rational system of therapeutics. Surrounded as we are to-day by the brilliancy of recent discovery in medicine, let us not forget to honour those great names of a preceding period who made clinical medicine and morbid anatomy their guide; and the student of medicine of to-day should be impressed with the idea that as the study of anatomy and physiology are the groundwork of the study of "life in health," so clinical work, combined with the study of morbid anatomy, will give him the only basis of an accurate knowledge of "life in disease." However, it is the addition to our knowledge, since we began to hear of the germ-theory, bacteria, sepsis and antiseptics, toxins and antitoxins, and sero-therapy, that has caused the rapid strides that have led up to the height we have now reached. What has been done, then, that has let so much light into the dark places of our knowledge? What is it that has so increased and made accurate what was already known of the true nature of many of the most severe diseases? Two new departments of science adjunct to medicine have arisen within that time which have both changed and supplemented our methods of study — bacteriology and experimental pathology. Since these methods of research have come to our aid we have discovered the cause of disease.

Previous to the advent of these sciences upon the field of action,

clinical observation and a study of morbid anatomy led to the belief that the contagious diseases especially were due to a special poison, but we were ignorant of its nature. We heard and read of the "materies morbi," the "zymotic influence," the "fever poison," and like expressions, which showed that the careful and trained investigators of previous years were able to deduce from observation of the phenomena of disease that a poison existed, but further than this they were unable to go. The belief that the zymotic diseases were caused by parasites was held by many students of pathology in the early part of the century. Henle not only held the belief, but proved clearly that living organisms must be the cause of disease. It remained for the science of bacteriology, with experiment by inoculation of disease upon the lower animals, to make that which was hidden from us before as plain as noonday! To know the cause of disease! How can we estimate the value of such a discovery? It has simply armed us tenfold as physicians in our battle with disease. How can we write calmly and without pleasurable excitement at the contemplation of a discovery that has made us tenfold better able to prevent and cure disease than we were in times past? Truly indeed have the sciences of medicine and surgery been revolutionized within the knowledge of the present generation.

Though we still hold to many old methods and give them due weight and place in our study of disease, we bow down with admiration before the newer discoveries that bacteriology has laid open to our view. The time at my disposal is not sufficient to enumerate the many death-dealing diseases that have been brought under control by our new methods of research, but the subject would be incomplete if I failed to mention some few of them.

Puerperal fever, that filthy and fatal disease! How many valuable lives have been carried away by its malign influence? And no death occurred in the practice of a physician that was so hated and dreaded as this. No death could occur that appealed to our sympathy like that of the young mother with her new-born babe. Do I not call up to the memories of many of the middle-aged practitioners who are listening to me to-day many days and nights of dread and anxiety that they have spent, in the early days of their practice, when this miserable disease was all too common? What shall we say of it now? It has been almost swept out of existence by the advance of science. To have almost banished puerperal fever from among us, if nothing more were done, should shed lustre upon the effort that attained it.

No one of the diseases to which we are liable has been the subject

of so much earnest inquiry and study as tuberculosis. The distressing character of the disease, its fatality, the fact that it spread among all classes and orders of people, and spared neither age nor sex in its ravages, were powerful motives to urge the active practitioner, as well as the student of pathology, to make vigorous search into its true character.

We were thoroughly learned in all the phenomena of its slow but fatal course. Before the science of bacteriology laid the truth before us, we knew everything of tuberculosis except what it was. It remained for that science to find the true cause, the tubercle bacillus. It is true we have not yet reached the point of being able to cure, but we have made a long step in that direction. We have learned this important fact, that it is an infectious disease, and is as communicable from person to person as Asiatic cholera or typhoid fever. We have learned how it can be avoided and prevented.

Again, what a splendid triumph it is to be able to say that we have particularly met and conquered that dread disease, Asiatic cholera, the very name of which but a few years ago would send a thrill of fear and horror through the nations of the earth. As with these so it is with a long list of virulent diseases—typhoid fever, tetanus, diphtheria, erysipelas, glanders, and many others have been traced to the special form of micro-organism which produces them.

There is another disease the mortality from which is very great, and one which is dreaded alike by physician and patient, on account of the prolonged suffering which precedes its fatal issue; I refer to cancer. The cause of cancer still eludes our search, though we have reason to believe it is due to some form of micro-organism, animal or vegetable. At the present time many investigators are working faithfully to isolate the germ of this disease; we earnestly hope that success may soon be within their reach. Let us be thankful that, though our progress in this direction has been slow, we have learned enough to know, or at least believe, that cancer in its very earliest stages is a local disease, and that the system is infected from the first point of growth. This advance in our knowledge has taught us one valuable lesson—that is, that there is only one hope for the patient, and it is by attacking the disease in its very earliest stage. It would not be within the province of a paper on medicine to do more than mention the magnificent opportunities for successful work which the science of microbiology has given to the operating surgeon within the past twenty years.

I desire, however, to trespass upon your time for a few moments while I discuss the question: What share have the English-speaking

people of the world had in this great upward march of medicine and its allied sciences? It must be acknowledged with regret that in the honoured role of scientific workers who have wrought the largest share in advancing this new science of medicine we find the names of many Germans, Frenchmen, Russians, Danes and Italians, and only a few to represent the English-speaking nations of the world. In making this statement I do not forget that it was the genius of the renowned Lister, whose name we all delight to honour, who first demonstrated the practical application of the germ-theory to surgical practice, thereby maintaining for British medicine the high rank and position it had always held in the past. Nor do I forget that among the scientists who have been carrying on this great work we find the names of Burden-Sanderson, Woodhead, Sydney Martin, Ferrier, Horsley, Welsh, Councilman, Vaughan and others; but most of the labour has been done in France and Germany and other European states. It is to the great laboratories on the continent of Europe—to Paris, Berlin and Vienna—that we must go to find both the cradle as well as the school-house of this new science, that has unfolded to us many of the human mysteries of life and death. The brilliant genius, the patient toil and careful study of the men of these and other great centres of medical investigation, have placed the world under a debt of gratitude that will not be appreciated or rewarded until the mighty results of their discoveries upon all forms of life are fully developed and properly understood; for as yet the science of microbiology, with its kindred studies, is in its infancy; and, in the light of what has happened, one is lost in admiration and wonder at the almost infinite possibilities within the grasp of its teaching. In the brilliant galaxy of scientific workers of Europe there is one name that stands pre-eminent among the rest—that of Pasteur. It is to France we look for the birthplace of the new science, and of Pasteur we can say without exaggeration that he ranks among the first of all the great discoverers of science who in times past have enriched the world with their genius. His labours in the study of hydrophobia challenge the admiration of every lover of science.

We regret that in these advances we have not, up to the present time at least, kept pace with other countries.

It is a fact to be regretted that the English, American or Canadian student has to learn two languages besides his own if he wishes to take a full course of study in physiology, pathology or bacteriology.

Within the last few years the larger institutions for medical education in London, New York, Edinburgh, Belfast, Baltimore, Montreal and some other places have been endeavouring to remove the stigma

from the English-speaking world; and now we find grown up in these cities large and well-equipped biological laboratories; but they have been established mainly by the efforts of the scientists themselves, aided in some cases by the munificence of wealthy benefactors. Why, then, should it be reserved for the continental nations of Europe to take the lead in scientific research?

Taking the whole British Empire, including Great Britain and her colonies, together with the United States, we find a population of over one hundred and fifty millions of people who boast, and, in the main, justly so, of being first among the nations of the earth in everything that pertains to advanced civilization. In the world of statesmanship, of literature and commerce, we take first rank. In power, position and influence the two great English-speaking nations are pre-eminent above all others. Why, then, should we take a secondary place in the world of science? It is not that we are behind others in ability or mental calibre; for in every department of life that requires intellectual development of the highest order we can point to names that rank as high or higher than those of other peoples. The reason is a simple one. It is that the continental nations of Europe foster and uphold science, their governments take upon themselves the duty of establishing laboratories, the workers in which are state officials, who are paid by the government and are thus enabled to devote their life to investigation and teaching without being troubled as to the daily wants of themselves or families. With us the very opposite is the case, science is left to the scientist and the scientist pursues his labours unaided by the State, and if he attempts to devote himself to original work he must do so by neglecting the practice of his profession, and it may be see his family stinted in their daily wants. We must state the fact, although it is not creditable to us, that science, which has for its object the preservation of human life and maintenance of health, is lightly thought of in England and the United States. We are all aware that the important subject of preventive medicine, which aims to remove the causes of disease, was not dealt with intelligently by the British people until within the past twenty years. Previous to that time medical schools were teaching hygiene, medical men were labouring to impress its importance upon the people, the medical press was urging the necessity for sanitary laws. It was demonstrated that thousands of valuable lives were being lost every year by preventable disease, yet no interest was awakened. It was not until the Prince of Wales contracted typhoid fever and his illness became so serious that for a time his life was despaired of that public attention became aroused. People began to

ask what this fever was? where it came from? and how it could be prevented? In a short time the trend of public opinion was strongly in favour of sanitary legislation. Parliament soon crystalized public opinion into sanitary laws which, with improving amenduents that have been enacted from time to time since, have given England a distinct department of the public service devoted to the public health.

The British people are a commercial people, and the same may be said of their offspring in the colonies and the United States.

If we wish to arouse public opinion in regard to the importance of these new sciences we must show that they have an influence on the material wealth and commerce of the country.

In most countries it is the farmer who is the real wealth producer. In this country farming is by far the most important industry, to it we look for the production of the food supply of the world. When we consider the enormous amount the export of the product of the farm returns to this country we can gather some idea of the immense importance that agriculture is to us. It is not necessary, then, to prove that everything that tends to give a more successful yield to the labour of the farmer should claim the special attention of the Government. I am glad to see that the fact is being recognized, though slowly, that the pursuit of agriculture requires an education in science, and so we find that schools of agriculture, experimental farms, and other means of teaching scientific farming, are growing up among us. But we are only waking up to the importance of this special scientific training, and though we lead the mother country in this respect (for this subject is to a large extent neglected in England) still we are only making a small part of the effort that should be made in this direction. In many European countries, by reason of the fact that science is fostered and supported by the government, its influence upon agriculture, manufacture and the arts is more quickly recognized and applied than in England, the United States, or in this country, and in consequence in many lines of production we find these countries, more especially Germany, are taking a lead with better and more finished articles in the markets of the world. This is more particularly the case in regard to those articles in which the advance of science has influenced production.

This new science of bacteriology has an especial relation to agriculture. As we now know that bacteria have a direct influence upon human life and its diseases, so the life of other animals and plants must be equally under the power of bacterial growth. To show the extent to which this is true it is only necessary to name some of the diseases of animals that are known to be due to micro-organisms, such

as glanders, tuberculosis, with its poisoning power on meat and milk, anthrax or wool-sorters' disease, actinomycosis or lump-jaw. In addition to these there must be other diseases due to bacteria in the various animals used for human food, and the raising of our food products in a perfect and healthy form is most important to the trade interests of the country. Then there must be the special bacteriology of each plant with its various blights, a thorough knowledge of which must be necessary to successful agriculture. The products of the dairy, butter and cheese, are governed in the changes that take place in their manufacture by what was known as fermentation. We now know that this fermentation is a complex process brought about in its different forms by various kinds of micro-organisms and that each organism has the power of influencing the colour, taste and quality of the product. The same may be said of the manufacture of bread, beer, cider, vinegar and wine.

In order to show what science can do in building up a lucrative trade I will call your attention to the extraordinary fact that Denmark at the present time almost controls the market of England in the supply of the best articles of butter. The farmers of Denmark have no special advantage over the farmers of England only this, that in Denmark the Government have established scientific schools in which the subject has been closely studied. Their bacteriologists have succeeded in isolating the various types of germ that produce special changes in the course of butter production, and by the artificial application of these they control and direct the fermentive process.

I will not weary you any further by dwelling upon this subject, as I am afraid to trespass on your time, and I will conclude by urging upon this Association the importance of its relations to the State in regard to this subject; for as it was in the pursuit of the great science of Medicine that bacteriology with its far-reaching influence was given to the world, it would be in the line of our duty as the chief medical organization of Canada to urge upon our Governments, both Federal and Provincial, their duty of founding and supporting schools of experimental science in this country.

If we desire to hold our place among the nations we must no longer depend upon private efforts for this purpose, the Government must undertake this duty and let it be done with no niggardly hand. Let our young men who have a taste for scientific work have an opportunity of exercising their skill. Open places for them where their ability will be rewarded. Let us be able to boast that this greatest colony of the British Empire was the first among the English-speaking people to show that science is no longer an amusement for the

savant or part of the frills of an ornamental education, but that it is a practical training for the every-day work of life, for the health and well-being of the people, and a most necessary factor for the protection of the great interests upon which the wealth of the country depends.

If I would be permitted to make a suggestion I would ask that this Association appoint a committee to enquire how much has already been done in the teaching of experimental science in Canada and to urge upon the Federal and Provincial Governments the need of much further effort in this direction.

I thank you very much for your kindness in listening to this imperfect paper.

