

performed, might, if unknown, lead to failure or serious difficulty.

The safety with which surgical operations can now be performed has added greatly to our resources in another direction. There are numerous cases the exact nature of which it is impossible to ascertain by mere external examination. To make sure of the precise condition nothing less than direct investigation will suffice. As matters at present stand, the required information can be obtained by what is called an exploratory operation, during which the part concerned can be fully examined, so that the surgeon may know not only what can be done, but the exact manner in which it should be carried out.

A very important result of this development of surgery has been to produce a kind of secondary revolution in the practice of medicine, for the only remedy in numerous cases which are termed medical consists in mechanical interference—in other words, in a surgical operation. In many forms of that grave condition, peritonitis, in many forms of malignant disease of the stomach and intestines, in gall stones and stones of the kidney, in some diseases of the brain, in paralysis depending on growths which press upon the spinal cord, in perforation of ulcers of the small intestine in the course of enteric fever, and in numerous other instances, the surgeon can render the physician indispensable assistance.

Again, it has been found that many of the most dangerous or fatal diseases met with in surgery are in their simpler forms comparatively mild and easily treated. It is only when they are complicated by the action of bacteria, that is, when infection occurs, that they assume a grave character. Thus there are forms of mortification which, if the part attacked can be kept free from the influence of bacteria, in other words, if the aseptic condition can be maintained, remain confined almost entirely to the part originally involved, and they do not disturb the general health. But should bacteria be allowed to enter upon the scene the whole aspect of the case is forthwith changed. The process of mortification becomes active and rapidly extends; the life of all the blood is touched corruptibly, fever is developed, and frequently in a few days a fatal result is reached.

Furthermore, the revealing light which was thrown on the field of pathology by the discovery of Pasteur has enabled observers to discern the fact that many dread diseases—for instance, tetanus or lockjaw—are due entirely to infection by a particular micro-organism. Let such infection be prevented and these diseases disappear from among men.

A very remarkable event in the chain of progress was the discovery of anaesthetics or of those agents by which consciousness can be completely and safely suspended while operations are being performed. Here was the realization of a dream which poets and philosophers had dreamt for centuries. It took place in 1846, and was the work of an American dentist of the name of Morton. The agent he employed was ether. Shortly afterwards, Simpson of Edinburgh discovered chloroform. Since those early days the subject has, of course, been carefully investigated, and at the present time several agents are regularly employed, either alone or in combination, in such a way that the peculiarities and susceptibilities of different patients may be met with the least amount of danger and subsequent discomfort. These agents are in so much demand, for example, at St. Bartholomew's Hospital—whence I have lately emigrated—that no less than four anaesthetists are occupied exclusively in giving them. Last year upwards of 8,000 administrations took place in that institution. Under the system which has now been established and in skilful hands, the administration of these various agents is so free from risk that accidents scarcely ever occur. And to provide as far as possible for the safety of the public every student at the hospital attends compulsory lectures and classes on the subject, and himself, of course under the most careful supervision, gives anaesthetics to from thirty to eighty cases. Similar arrangements are in vogue at all the other hospitals. At the present time every surgical operation which entails more than slight and momentary suffering, whether it be the removal of a firm tooth or one of the most formidable and critical operations, anaesthetics are given as a matter of course, as they are also in the numerous examinations that are called for, especially in those in which it is necessary that the muscles should be all relaxed. Surely this discovery of anaesthetics was one of the most priceless gifts that have ever been conferred on the human race, particularly as it was made before the dawn of the new surgery, for without it obviously surgery in its recent developments would have remained an impossibility.

And now, Mr. Vice-Chancellor, while heartily thanking you for having spared time to pay me the honour of your presence to-day, and for many acts of courtesy and kindness which I have already received at your hands since I assumed my office under your jurisdiction, I will conclude by quoting words which were recently used by the Master of Trinity, and which appear to me to embody grand and exalted conceptions, and to be instinct with noble eloquence:

"Let us all, if we can, agree in this... that the noblest function of this ancient Mother of all is to be a source of light, to cherish and diffuse what has been revealed already; to believe and hope that there is always more on its way; to search the heavens for it before it has shone; to hail it with joy when at last it dawns; to diffuse it also without reserve to all; and, finally, to own with humblest reverence at each glorious discovery,

"Not unto us, O Lord, not unto us, but to Thy Name give the praise."

An Address ON

THE WORK AND PURPOSE OF THE ROYAL ARMY MEDICAL COLLEGE.

Delivered at the Opening of its Eighty-eighth Session.

By SIR WILLIAM TAYLOR, K.C.B.,
Director-General, Army Medical Staff.

GENTLEMEN,—It is a great pleasure to me to welcome you here to-day on the threshold of your life as army medical officers. My welcome is sincere and honest, for I feel assured that, in the selection you have made of a career, you have chosen wisely.

It is fitting, too, that your career in the army should begin in this College, for here, I believe, you will find that, though qualified to practise medicine, your education is not yet complete, but you have yet to be instructed in certain special branches of professional knowledge with a view to your being the better equipped for your military medical career, and which you might never have found it necessary to take up had you remained in civil life. Though you are now, each one of you, legally qualified to practise your profession in civil life—are fully equipped for such practice—there are still subjects you must master before you can be considered, or can consider yourselves, able to take up the varied and multifarious responsibilities of an officer of the Royal Army Medical Corps.

You are further to be congratulated on the fact that you are now enabled to study these other subjects here, in London, one of the greatest centres of instruction in matters bearing on medicine, surgery, and hygiene.

THE HISTORY OF THE ROYAL ARMY MEDICAL SCHOOL.

The recommendations of Mr. Brodrick's Reorganization Committee have, through the labours of the officers of the headquarters of the Army Medical Service and of the Advisory Board, been brought to a successful issue. You should know that a special Subcommittee of the Reorganization Committee dealt, in a somewhat exhaustive manner, with the details of a college scheme; and further experience of the methods which have been in operation for the early and advanced courses of study for army medical officers has enabled the Advisory Board to put forward proposals of a comprehensive nature.

The course of post-commission study, now happily provided for and established, renders the establishment of a military-medical teaching institution in the metropolis essential, and the location of the College in London entails the attendance of junior officers there.

It is unnecessary to enter fully into a consideration of all the conditions which the College is designed to meet, but it appears plain that the effects upon the efficiency of the medical services of the country should be valuable. It goes without saying that the closer the union between the civil and military members of the medical profession (and in the latter I include the auxiliary medical services) the better for the State and for the Royal Army Medical Corps. For it is not the least of the objects sought to be gained by the College that it should become a centre towards which, for imperial purposes, the

medical profession at home and in the Colonies, the regular and auxiliary military medical services, should converge. It is not now a question as to how far the Royal Army Medical Corps is alone prepared to undertake the responsible duties which devolve upon its officers in time of war. If the military efficiency of the country is held to depend largely upon the military education and training of the civil population, it is assuredly true that the medical profession is equally deeply concerned with military medical problems. While, therefore, the primary object of the foundation of this College is to provide for the more efficient training, elementary and advanced, of the military medical officer, it will be possible to adapt the school to the requirements of the profession generally, and of the auxiliary forces, by means of lectures, exhibits, etc.; in other words, by the formation of a Military Medical Institute. This College, then, should have far-reaching results, beneficial alike to the civil and military medical professions.

Time will not permit me to give a complete history of army medical education. The earliest official recognition of specialized study for military medical officers on any important scale is associated with the revered name of Lord Herbert of Lea, who instituted the Army Medical School in connexion with the Royal Victoria Hospital at Netley.

The records of the Senate of the Army Medical School at Fort Pitt, Chatham, show unquestionably that the contemplated removal of the school so far from London as Southampton, was received with regret. The professors and the senate appear to have recognized the difficulties, inconveniences, and hindrances likely to arise from a position of isolation, and favoured the alternative proposal of setting up the school in connexion with the then recently-established Herbert Hospital at Woolwich. In support of this they urged

its proximity to London and the offices of army administration, particularly that of the head of the department, of the great hospitals, medical schools, and learned societies, and the facilities its nearness to these great fountains of medical knowledge afford for profitable intercourse, as well as for receiving visits of professional foreigners of distinction, who have already evinced a desire to reciprocate benefits to profit by what the professors have to show and to aid them in return.

We may be certain that Professor Parkes, who signed a document in which these words occur, exerted a potent influence in the expression of views which have now been independently adopted by the Secretary of State.

Since the days of Lord Herbert, the organization of the medical department of the army has undergone remarkable changes. It may be maintained that the efforts of its officers have been mainly directed to improvement in the military position; but it should always be remembered that the principle of autonomy has been a fundamental one in the minds of those who have been responsible for the direction of events. It is quite clear that Mr. Sidney Herbert was impressed with the importance of the development of the military medical service in both the military and professional senses. It is, at any rate, certain that when the history of the Medical Corps comes to be written it will be abundantly clear that at least one of the professional advisers of the Secretary of State of the day held views regarding administration in war which must have profoundly impressed that statesman. Some of the letters of Mr. (afterwards Sir Thomas) Longmore, written from the Crimea, clearly indicate the position which powerfully influenced all the subsequent events. The enthusiasm which, under the influence of Parkes, Longmore, and Maclean, became the predominant feature of the early years of the school of Sidney Herbert, cannot be said to have been extinguished in the struggle for autonomy which followed. But it was hidden. Meanwhile, the influence of the professors was enormous. Charged with the success of the first attempt at education in hygiene and tropical medicine ever made in this country, their disciples imbibed something of their spirit. The school came subsequently to be described by American army surgeons as "the Mecca to which the thoughts of army surgeons all over the world were directed."

HYGIENE IN THE ARMY.

That we may clearly understand the gradual development of the importance of preventive medicine—hygiene—in the army, let us go back to a much earlier period than that of the Crimean war.

Sir James McGrigor, shortly after his appointment as Director General of the Army Medical Department in 1814, organized a system of returns and reports, which may be regarded as the foundation of the first systematic attempt to control the sickness and mortality prevailing in the army. In 1835 Mr. H. Marshall, Deputy Inspector-General of Hos-

pitals, and Lieutenant Tulloch, 46th Regiment (afterwards Major-General Sir A. M. Tulloch, K.C.B.), were associated in preparing a report on the sickness and mortality of the troops serving in the West Indies. In the following year Dr. T. Graham Balfour, M.D., F.R.S., replaced Mr. Marshall, and the inquiry was extended to other Colonies. The reports prepared by these officers were published in four volumes, and to these reports may be given the credit of first seriously attracting the attention of the military authorities to the fact that many of the agencies which exercised an adverse effect on the health of the soldier were under control and could be removed or ameliorated. In 1848 a second series of reports was prepared by the same officers, embracing a further period of ten years. As the result of the Crimean war, a Royal Commission was appointed in 1857 to inquire into the regulations affecting the sanitary condition of the army, of which Commission the Right Honourable Sidney Herbert was president and Dr. Graham Balfour secretary, and two of the practical outcomes of the Commission were the establishment of the Army Medical School and of the Statistical Branch of the Army Medical Department.

Since then the subject of preventive medicine has always occupied a foremost position in schemes of military medical education, and in this regard it is of interest to note that the Herbert Commission gave expression to the following views:

The medical officer should, therefore, not only be thoroughly conversant with sanitary science, but with the mode of its application to the preservation of health under every possible variety of circumstances and character.

It may be fairly claimed that the foundation of the Army Medical School was the very beginning of systematic teaching of sanitary science in this country. The Army Medical School may well be proud of the world-wide fame which its first Professor of Military Hygiene earned for himself. Among the many reputations as hygienists which have since been earned there is no name so illustrious as that of Professor Parkes. The history of sanitation in England is the history of army sanitation, and Parkes has justly been called the "Father of Hygiene." To him belongs the credit of having laid the foundation of that rapid advancement of the knowledge of the laws of health which has placed this country in the forefront of the nations of the world as regards sanitary progress. Parkes's *Practical Hygiene* for years remained the standard textbook, and while, to keep progress with the times, it has had to be added to and to a large extent rewritten, the book, though no longer bearing the well known name, is still one of the leading treatises on the subject. Apart from its influence upon the spread of sanitary knowledge throughout the world, the teaching of Parkes bore excellent fruit among the many army medical officers who had the great privilege of being his students, and it has in that way contributed in an immeasurable degree to the enormous improvement which has taken place in the sanitary surroundings of the soldier since the days of the Crimean war.

Professor Parkes was succeeded in the Chair of Military Hygiene by the late Surgeon-Major F. S. F. de Chaumont, F.R.S., a man who also did much to advance the progress of sanitary knowledge. Professor de Chaumont was a leading authority on hygiene, and perhaps his best known original work is that connected with the ventilation of barracks and his dietetic researches. He was a man of wide culture, a capable linguist, and an able mathematician. He edited several editions of Parkes's classical work, and was the author of many papers on sanitary and scientific subjects.

The next incumbent of the Chair was Colonel Lane Nottter, also well known in the world of hygiene, and a frequent contributor to the literature of his special subject. The present Professor of Military Hygiene, Lieutenant-Colonel R. H. Firth, has already made a name for himself in sanitary science. He has written much and well on sanitary and medical subjects. His best recent original researches have been a study of the pathology of dysentery, and an inquiry into the influence of soil, fabrics, and flies in the dissemination of enteric infection, a valuable piece of work done in association with Major Horrocks, who was at the time Assistant Professor of Military Hygiene. Major Horrocks is also well known as an authority on the bacteriological examination of water, and is the author of the most complete monograph on that subject which has as yet appeared. In Lieutenant-Colonel A. M. Davies we have another able authority on hygienic questions. He was Assistant Professor in the Army Medical School in Professor de Chaumont's time, and for a year discharged the duties of professor.

Afterwards, as sanitary adviser at army headquarters in India, he did most excellent service in furtherance of sanitary progress in that country. Improved sanitary conditions in many Indian cantonments have resulted from his labours, but perhaps his best work in India was in connexion with the provision of pure water supplies to many stations. He is the author of a most excellent book on hygiene, and he now holds the appointment of sanitary expert on the Advisory Board at headquarters.

Amongst men who have had no connexion with the teaching staff of the school, but who have taken a leading share in the advancement of military hygiene, many names might be mentioned: Massy, Home, Marston, Ker Innes, Welch, and Martin are perhaps the best known. Of the recent men, Macpherson, keen, enthusiastic and thorough, should receive special notice. He was sent on special duty to South Africa to report and advise on sanitary matters connected with the South African garrisons.

Since the institution of the medical school every medical officer entering the Army Medical Service has had a careful training in hygiene to fit him to deal with the numerous sanitary questions which he is sure to encounter in the performance of his ordinary duties, under very varying conditions.

Prevention of disease is a most important part of his daily work—I had almost said the most important part. The result is that a very large amount of quiet unostentatious sanitary work is being done by army medical officers in all parts of the world, and there can be no doubt that the greater part of the amelioration in health conditions, in stations which were formerly unhealthy; and the improvements which have resulted in connexion with the housing, clothing, and feeding of soldiers, and the removal of causes of preventable diseases, have been due to well-directed efforts, born of the knowledge imparted to every officer of the service during his course at the Army Medical School. The good work which has been done has well sustained the great reputation of the school, and that is the best augury for the future. With well-equipped laboratories in the new Royal Army Medical College we need never fear that we are likely to be outstripped in the race of progress, and we look forward confidently to the army medical officer being kept abreast of the times, nay, leading them as far as sanitary knowledge is concerned.

I have learnt to look upon a low sick-rate as the sign that the officer in medical charge of the troops has been doing his duty to them and to the State; that he has been spending his time with intelligent observation in the lines, that he has been seeing to the soldiers' surroundings, has been interesting himself in their personal habits, and so by tact and sympathy gaining the confidence of the men, the sure, the only way of acquiring that influence with them which will enable him to give advice which will be listened to and acted upon.

You will sometimes hear it said that the army doctor has little to do. Let not that disturb you; you will find from experience that it is otherwise. Work on unceasingly, work earnestly with might and main at prevention, which is better than cure; strive unremittingly to teach every soldier under your care how to avoid the little ailments of daily life, as well as how to safeguard himself, as far as it is possible to do so, against those more serious and more dangerous diseases to which he is specially exposed. It is also said that his practical experience is confined to treating the diseases of early manhood, and that this limitation of practice leads to stagnation of effort and to blunting of mental acuteness and judgement. Believe me, there is nothing further from the truth. No army medical officer need let his knowledge rust; his opportunities for keeping himself abreast of the knowledge of the times are as good, and I think even better, than those of the doctor in civil practice. There is abundance and variety of clinical work to be found in our army hospitals. The field of the army surgeon is world-wide, and in the domain of tropical medicine he will find a field for observation and research that affords opportunities for practice and progress that no other section of our profession possesses.

PATHOLOGICAL WORK IN THE ARMY.

Results not less important than those which have resulted from the teaching of hygiene have followed the pathological teaching at Netley. Consider the history of that interesting and most important disease, Malta or Mediterranean fever, interesting and important from a military and naval as well as a civil point of view.

The true nature of this fever was unknown until the year 1886. Up to that time it was thought by some to be enteric

fever, by others to be remittent fever, and by others still to be a combination of these two fevers, and called by them typho-malarial.

In September, 1887, one of our officers—now Colonel Bruce, F.R.S.—wrote a paper announcing his discovery of the micrococcus melitensis, showing that this bacterium is the specific cause of the disease, and he separated Malta fever definitely from enteric and malarial fevers. The next point in its history was to overcome the difficulty of diagnosing the disease during life. That difficulty was overcome by Professor A. E. Wright and his assistants in the Army Medical School, who discovered the blood test for the fever. The incubation period was also made out there, once by Professor Wright, who knowingly inoculated himself, and on other occasions through the accidental inoculation of other members of the staff. Our knowledge of its geographical distribution was much extended by officers of the Royal Army Medical Corps; and here I may quote from a paper by the late Professor of Pathology in the Army Medical School:

By the application of the blood test to patients invalided from abroad, it was determined that Malta fever existed in certain stations in Northern India. These results were confirmed and extended by other observers abroad and in India, with the result that the disease is now known to occur all over the Mediterranean basin, in Northern, Central, and Southern India, and in Hong Kong and South Africa.

Quite recently the medical officers of the American army have described the occurrence of the disease in Puerto Rico, in the Philippines, and in certain other of the Pacific Islands.

There is still much to be done in the elucidation of this fever, and we are looking anxiously to our officers stationed at Gibraltar and Malta to tell us how the disease is conveyed from the sick to the healthy; whether by water, food, inhalation, inoculation, or by means of an insect carrier; how the micrococcus leaves the body, how it behaves outside the body, and many other points of great interest and utility in framing measures of prevention.

It would appear then that officers of the Royal Army Medical Corps have done their share in the investigation of this disease, and in this alone the establishment of this school appears to be justified.

Let us now turn to another most important army disease—enteric fever. The principal work done in the Army Medical School during the past few years in relation to this disease has been the attempt to modify its ravages by antityphoid inoculation. The prevention of enteric is one of the most momentous questions of the day in army sanitation. War would lose half its terrors if this disease could be kept within bounds. We know what an immense amount of work has been done by Royal Army Medical Corps officers under the guidance of Professor Wright, and, if the results are still under discussion, many are of opinion that it is on the lines pointed out by him that final success will be attained. For the careful consideration of the subject a subcommittee of the Advisory Board has been formed, and Lieutenant Smallman, R.A.M.C., is devoting himself to experimental research on this subject at the Lister Institute.

Time will not permit me to take up the closely allied disease, dysentery; but much of the recent work on this disease has been done by our officers, among whom I may mention Birt, Bruce, Firth, and Horrocks.

Leaving the bacterial diseases, the history of a disease which is much in evidence at present, trypanosomiasis, is of interest in connexion with this subject.

This branch of tropical medicine has its origin in the discovery by Surgeon-Major T. Lewis, F.R.S., of a flagellate in the blood of rats, which was afterwards named "trypanosoma lewisi." That officer, trained at Netley, was one of the best types of scientific men. At the time of his death it was written of him that "he was gradually becoming a very centre of scientific influence and a source of inspiration for earnest work as a teacher and of genuine research in the Army Medical School in his position as Assistant Professor of Pathology. He was, indeed, one of those men "who go on working for Truth's sake," and he imbued the minds of those he taught with the same keen love of work. The life-history of such a man and the work he did is worthy of more than a passing notice for the example it teaches, as pursuing a lofty ideal. He died at the early age of 44, almost before the scientific medical world knew what it possessed in his life.

Sunk like an Argosy scarce left the shore;
And the boundless depths of ocean hold
Pearl, and diamond and gleaming gold,
Lost to the use of man for evermore.

The next step in the trypanosome problem was made by

Evans, who found similar flagellate organisms in the blood of horses suffering from surra.

The third step was the discovery, also made by one of our officers, Colonel Bruce, that tsetse fly disease was due to the presence in the blood of a trypanosoma, and that the fly merely acted as a carrier of the parasite from the affected to the healthy animals.

And, finally, the last addition to our knowledge of this class of diseases has been again made by the same R.A.M.C. officer, who within the last few months has discovered that the sleeping sickness of Western and Central Africa is nothing more or less than a human tsetse fly disease.

In another great group of diseases, namely, filariasis, the pioneer work was again done by Surgeon-Major Lewis, who discovered and described the *filaria sanguinis hominis*, from which discovery most of our work on this group of diseases has dated, and there can be no doubt that his papers are the most masterly disquisitions on the subject of filariasis that have appeared in this or any other language.

To come to the present day, one of the most interesting discoveries of recent times in the etiology of human disease was made a few months ago by your Professor of Pathology, Major Leishman. As the result of the examination of microscopical preparations of a spleen from a case of what has been known locally as Dum-Dum fever, he came to the conclusion that the disease was not malaria, but was caused by another kind of protozoal parasite. When we think of the difficulty of differentiating the various appearances seen in the splenic pulp, we must heartily congratulate Major Leishman on the keen observation and acumen which enabled him to detect these infinitely minute bodies. He wrote an excellent paper describing what are now known as Leishman's bodies, and this has led to work being done on the subject by Donovan, Laveran, and Ross, which goes to show that the discovery is a notable one. The generic name *Leishmania* has been proposed for the parasite, and Major Leishman has every reason to feel satisfied in having done such a fine bit of observation.

To recapitulate the work done by medical officers trained in this school would almost be to write the history of tropical medicine, and so I will close this cursory account of their attainments by mentioning to you the name of Major Ronald Ross, F.R.S., the discoverer of the etiology of malaria, who received his training in hygiene and pathology in our school.

CONCLUSION.

Gentlemen, the Army Medical Service has every reason to be proud of the work done by such of its officers as those I have named, and it holds them in honour, not only for the work they have done, but also for the bright example they have given and are still giving to all who would do well.

If the record of the army medical officer in the domains of general medicine and surgery are not so brilliant it is partly because the isolation of the school hitherto from the great civil schools rendered any plan of advanced teaching in these subjects impossible, and perhaps more because he had no channel through which to let his work be known. It is now recognized that the closest connexion between the leading institutions and the College must be maintained to ensure effective education. We in the army have held that this connexion will have effects upon the medical profession of Imperial importance, and we cannot doubt that far-reaching consequences will follow that long-desired combination of the civil and military medical professions, not only for teaching purposes, but for the serious study of the adaptation of the science and art of medicine to the science and art of war.

Just one word more. It may seem disheartening to you who have just finished your course of study and qualified that you should have to begin your career in the army by going to school again. Gentlemen, we all, each and every one of us, remain at school every day of our lives, either as diligent and attentive learners, or as idlers, not listening; the demonstrations and experiments continue to be made before our eyes if we are intelligent and attentive enough to see them. Life to those of us who would do well, who would succeed, and who would leave "behind us footprints in the sands of time," means work, constant work, for our own happiness and for the general good.

Know'st thou yesterday, its aim and reason?
Workst thou well to-day for worthy things?
Then calmly wait to-morrow's hidden season,
And fear not thou what hap so e'er it brings.

Believe me, gentlemen, you will find the greatest happiness

in constant, earnest work for the benefit of your fellow-men, and will sooner or later realize—

That he is bravest, happiest, best,
Who from the task within his span
Earns for himself his evening rest,
And an increase of good for man.

The Lettsomian Lectures ON ASEPTIC SURGERY IN THEORY AND PRACTICE.

Delivered before the Medical Society of London

By CHARLES BARRETT LOCKWOOD, F.R.C.S.ENG.,
Surgeon, St. Bartholomew's Hospital.

LECTURE I.—INTRODUCTORY.

I THANK the President and Council of the Medical Society of London for the honour they have done me in inviting me to deliver the Lettsomian Lectures. I propose to try and justify this choice by lecturing upon a subject which must be of interest to every one of the Fellows, whatever line of practice he may pursue.

And, at the outset, it is desirable to say how I intend to proceed. As a matter of fact these lectures will be on the same lines, and a continuation of, the reports on aseptic surgery which I have published at intervals since 1890.¹ It might be thought that little was left to be said upon such a well-worn topic. But every one knows that although all surgeons aim at asepsis, they endeavour to attain that end by many different and ever-changing methods. Some of these methods I have tested, and you will hear the results. I shall also try to tell you what has been the result of my own methods of treating wounds. To render this of value it will be necessary to lay emphasis upon the unsuccessful cases, and especially upon the circumstances which led to failure. I will not insult your intelligence by talking as though I operate upon the immortals, who die not, nor suppurate. All operators must have a certain percentage of sepsis. When sepsis occurs the cause is to be sought for in the patient, in the environments, in the methods, in the application of the methods. It is instructive to the philosophical mind to contemplate the relative importance which is attached to one or other of these sources of failure. I have heard a surgeon vehemently maintain that, when a wound suppurated, the patient was at fault. I have heard another ask whether there was not a deal of suppuration about, as though it were a kind of epidemic. The surgical egotist never admits the possibility of failure either in his methods or in their application. As a matter of fact the fault may lie in the patient, in the environments, in the methods, or in their application. If we possessed definite scientific information, there could be no room for differences of opinion, and it is singular that better scientific information is not forthcoming. The research is difficult and surrounded with fallacies. But what an advantage it would be if, when sepsis occurred, we knew the exact state of the patient, the bacteriological conditions of the wound, of the atmosphere, of the operating theatres; the cubic capacity of the ward, and the condition of the air in it, the purity of the materials and appliances, and, lastly, the methods of the operator. Most of our great hospitals now possess well equipped bacteriological laboratories and skilled bacteriologists, so that some at least of the difficulties have vanished. In a very humble and inadequate way I will endeavour to deal with some of these questions using, as I proceed, the clinical and bacteriological material which is at my disposal, though I am fully conscious of the crudeness of the attempt.

It is strange that we should be obliged to begin with a definition of the term "aseptic." But whoever reads the medical papers with reasonable diligence will agree that the need exists.² Of course I am aware that there can be no agreement in the definition of general terms. But on this question the disputants are divided into two camps. In one are those who would apply the term aseptic to the *methods* they employ, and in the other are those who apply it to the *end* they achieve. Let us consider the position of those who apply the term aseptic to the methods. They begin by assuming that chemicals are harmful, and therefore endeavour to do without their help. Everything brought in