

# Three Orations:

## The Lister Centenary

By Sir W. Watson Cheyne, 1927.

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### Three Orations

#### I

*Paper delivered in commemoration of the first centenary of Lister's birth  
on April 5, 1827.*

The following short address was delivered at King's College Hospital on April 8, 1927, by Sir William Watson Cheyne, Bt., who was closely associated with Lister for a period of over twenty years. On this occasion a number of Lister's former house surgeons were also present and gave some very interesting reminiscences of their association with Lister, which we hope will be shortly published.

MY LORD, LADIES AND GENTLEMEN, - We have met here this afternoon to commemorate a great event which happened a hundred years ago, namely, the birth of one who with every right must take a very high place amongst the great men of the world, namely Joseph Lister.

As your Chairman has just told you, this event is of special interest to King's College Hospital, because, although the early part of Lister's work was carried out in Glasgow and Edinburgh, the last sixteen years of that work was done in King's College Hospital, London, and it was during that period that he completed the simplification of his methods of wound treatment, without in any way altering the principles on which those methods were founded.

In speaking of Lister as one of the great men of the world, it is difficult to define exactly what constitutes such greatness. Is it the possession of a very powerful analytical mind, or of great powers of observation and deduction, or of clearness of

generalization, or is it to be awarded for the value of the work in connection with the progress of civilisation? In the world's history there have been great statesmen, great generals, great philosophers, and great religious teachers whose influence and work have left an indelible mark on the future happiness and progress of the human race. But the outcome of Lister's work is perhaps more widespread than that of any of those great men, and its influence on mankind is not limited to any country or to any race. The number of lives saved and the amount of suffering and ill-health prevented by the abolition of septic diseases is incalculable.

I have been asked to-day to speak of Lister as a man, rather than as a scientist, and as I have already spoken and written a great deal about these matters, and as I see a number of Lister's old pupils and old house surgeons present, I shall simply introduce the subject quite shortly and then ask some of his old pupils to recall some of their experiences. In this way we shall get a much better picture of the man and the way in which he carried out his work.

His test was the presence or absence of sepsis after an operation. If it was present he blamed himself and looked for the error in his technique and studied how to prevent it in future. The test of his methods was the absence of sepsis in the wounds, and if sepsis should occur the surgeon must not blame his assistants or his materials, he must blame his own work and try to ascertain where and how it was that he had made the mistake. No progress will be made if the operator ascribes a bad result to anything other than a bad technique.

Some five years ago I went for a pretty long sea voyage and there were a considerable number of people on board who had been operated on but hardly with success, and it was interesting to hear them discussing the troubles through which they had passed, and praising their surgeon for the great attention to them in disagreeable circumstances, and blaming everything but the real cause.

The septic troubles were ascribed to two chief occurrences. In the first place, numbers of the cases suppurred because they had been attacked by influenza on the very morning of the operation, and with a view of preventing any set-back these patients had daily injections of vaccines prepared from bacteria taken from the throat! A smaller number had been attacked by gout which had settled in the wound, and in these cases the patients felt that they had been very unjustly treated by Nature because they had never drunk enough port to give them that disease! Most of these patients diligently drank Yodil water, which was at that time at the zenith of its popularity. It was rather sad to hear that the surgeons had not blamed the technique employed in these cases. But I need not continue this line of thought, because the war is not very long over, and no doubt if such accidents continue to happen they will be thoroughly investigated.

It is just fifty years ago since Lister received an urgent invitation from the authorities of King's College Hospital to come to London to fill the place in that hospital which had become vacant by the death of Sir William Ferguson in the preceding year. That request came as a thunder-bolt to Lister – he had settled down in Edinburgh and was supremely happy in his life there, and among his ideas for the future there was no place for removal to London or anywhere else. He had many friends who loved and

admired him; not only for his ability, but also for his gentleness and sympathy with suffering and his readiness to help the sufferers.

His wife was a native of Edinburgh and had all her friends and relatives there. Perhaps, however, it was in the teaching of large classes of enthusiastic students that gave him the greatest pleasure. He was especially pleased to go round the wards quietly on a Sunday with some of his older students and a good many foreigners. When this invitation from London became known the students were violently opposed to it, and they held meetings and sent addresses to him to refuse the invitation. At first he did decline it, but a great deal of pressure was brought to bear continuously on him and he ultimately agreed to go. The argument which chiefly influenced him was, that although something like eleven years had elapsed since his first publication on the treatment of wounds, there were still very few surgeons in England who had adopted his methods and many men of great ability strenuously opposed his views. He thought that by being in the great metropolis he would bring his work before the profession and influence them in its favour. Comfort and happiness were for Lister of little consequence as compared with the rapid adoption of his methods by surgeons generally. Whether he judged rightly or not has been frequently discussed and no definite answer has been got.

I remember well one Sunday morning, in the spring of 1877, being awakened in my room in the Edinburgh Infirmary (I was Lister's house surgeon at that time) and I found that it was Lister who had come to tell me of his invitation and to ask me, in case he accepted it, whether I would go to London with him and act as his surgeon for another six months. He told me also that he was proposing to ask Dr. John Stewart, of Halifax, as clerk and second house surgeon, and W.H. Dobie, of Chester, and James Altham as dressers. Needless to say we all accepted without any hesitation. I remember well the October in 1877, now over fifty years ago, when we set out from Edinburgh on our crusade to convert the unbelievers in the great metropolis. You can readily understand that we four looked on our selection as an unbelievable honour; there was no question of self, either in the mind of the chief or in ours – we all felt, as I fancy the old crusaders felt, that we were going into a distant part of the world to do our best to persuade the inhabitants that our methods as introduced by Lister were the only proper ones. Our only aim was to do our part of the work as correctly as we could so that the onlookers might see for themselves how true were the claims that were made by the pupils of Lister as regards his success.

For a long time his classes were very small, and this was a great grief to Lister, for it is well known that the larger and more appreciative the audience the better is the lecture.

The unpopularity of Lister's teaching in London was due to the fact that it was very new and very advanced and not accepted by the teachers in the other schools. The result was – that at the Pass examinations Lister's pupils were very apt to express opinions and views which were not accepted by the examiners for the degrees and led frequently to the rejection of the student who was bold enough to mention them at his examination. Hence in the early years of Lister's work at King's College Hospital his classes were only attended by the abler senior men and by the men who had already obtained their degree and who had remained at hospital with the view of acquainting themselves with Lister's work and if lucky of obtaining the resident appointment.

Lister did not, however, in spite of this disappointment, relax his work nor his efforts to spread his views in the two directions along which they were now being developed. When he came to London one of these lines of work was to search for far less irritating but equally effective antiseptic substances, and the second, to increase the scope of his operating work, as he became more and more sure of the accuracy of his methods.

I think that one of the most striking things in Lister's work and teaching was his great anxiety that anything that he said or did should be as accurate as reason, observation and experiment could make it. To get at the truth as accurately as possible was his great aim, and if subsequent practice and experiment threw doubt on his former teaching, he was always ready to accept the necessary modifications. Lister hardly ever published any of his surgical work, although he was often asked to do so; indeed, I myself several times asked leave to publish some of his most interesting work, as he had no time to do so himself. But he would never give leave to do so, although he had published many cases operated on by Syme when he was Syme's house surgeon. But, as he pointed out, the cases were very different. Syme was one of the greatest surgeons of his day, and his operations were examples of great manual dexterity, well-thought-out procedures, and a fine knowledge of anatomy, all of which were taught in the schools. On the other hand, Lister's operations introduced another question, which was all important, namely, the question of asepsis. Many operations comparatively simple in their performance were tabooed by the surgeons of the day, and rightly so, because they were so apt to be followed by severe septic trouble. For example, if healthy joints were freely opened the chance of sepsis was very serious, but the operation seemed so simple and satisfactory in Lister's hand that a man who did not practise asepsis might quite well be tempted by Lister's results to perform a similar operation, with fatal results, and Lister held that the publication of new operations in such circumstances might lead surgeons who did not thoroughly adopt antiseptic precautions to operate themselves, and might result in grave injury to the patient, or even to his death from sepsis. In those days the hall-mark of a surgeon was one who operated quickly, carefully and neatly, and it could hardly be reckoned as a science; but Lister's teaching and work soon showed that apart from the above qualifications the surgeon of the future would be the man who not only followed these old lines but also took full advantage of the rapid progress of science and its application to surgery, more especially in the early days of the development of the science of bacteriology. From this same point of view Lister did not at all approve of a surgeon who has retired from active operative surgery nevertheless carrying on a consulting practice. He held that the only opinion the surgeon could in those cases express was the result of his own experience, which might not be similar to that of the surgeon who was to perform the operation, and especially was this the case where the operation is advised by a surgeon who has not adopted Lister's work. I remember a case in point very vividly. One day, when I was doing some work for Lister in his workroom, a lady came in to consult him about a cancer of the breast with extensive glandular infection. Lister had no idea that she had consulted any other surgeon before coming to him, and thinking that she wished him to operate, if thought advisable, he advised a complete excision. She then said to him that the gentleman she had consulted previously to seeing him had strongly advised her not to be operated upon, and this surgeon was one of Lister's chief opponents as regards the treatment of

wounds. The lady said that after the advice Lister had given she would go back to her own surgeon and ask him to perform the operation.

Lister was very much concerned at the result of his advice, for he felt certain that an operation by this surgeon would be followed by some septic disease, and he accordingly changed his opinion and strongly advised her to accept the decision of the former surgeon. Lister had asked me to see the case with him, and I well remember that he walked up and down the room, perspiring freely, as he did in all moments of excitement, and ultimately plucked up courage and told the patient that his advice was based on the assumption that he himself would be asked to perform the operation, and advised her to be guided by the first opinion and not undergo an operation.

Some people might ascribe interested motives to Lister's action in this case, but knowing Lister as I did, there is no question whatever that he was only thinking of the best course for his patient to follow. I shall not continue my remarks on this occasion, for we have the pleasure of having with us a number of Lister's pupils and house surgeons who have kindly agreed to recall some of their experiences.

## II

### **On the Opposition to Lister's Work**

by Sir William Watson Cheyne.

EXTRACT FROM PAPER IN CENTENARY VOLUME, 1827-1927 (LISTER'S), EDITED BY DR. LOGAN TURNER.

I first saw Lister and made his acquaintance in Edinburgh during the winter session, 1872-1873, and I was closely associated with him from that time until he had to give up work and retire to the country early in the present century.

During the second year of medical study in Edinburgh I had an interval between classes. As there was no hospital club in those days, I took out my hospital ticket so as to have shelter while waiting for my next class. On the day of my first visit to the infirmary, I found my way by accident into Lister's lecture-room, and although I knew no surgery, he spoke so clearly and plainly, that my enthusiasm was at once aroused. On Lister's lecture days, as soon as I returned home, I made a point of writing out my notes and recollections of what he had said in a book specially bought for the purpose; this book is now among the Lister records at the Royal College of Surgeons of England.

How different were the lectures and demonstrations given by Lister from those in the systematic course of surgery which I was attending at the same time. The latter were full of curious theory, almost impossible to understand, and very difficult to memorize, while Lister's words at once held the attention of the student by reason of the new and intelligent statement of the subject. Like the majority of students, I was fascinated by the subject and by the lecturer, and often of an evening, when tired with

other work, I would take up my notebook and dream of the wonderful future which was opening up for surgery.

And now I may relate what came from this early and accidental course. I have never told the incident as it seemed to favour of bragging, but it is interesting and curious as showing how an apparently trivial occurrence may shape the whole course of one's life. In those days in Edinburgh, class examinations, which all students were expected to attend, were held from time to time (in winter generally twice during the session), and at the end of the session the list of those who got 75 per cent. of marks was announced in order of merit, and bronze medals were given to the first two or three men according to the number of students who competed. Being a very junior student, I had not intended to compete in the clinical surgery class, because it was attended only by fourth or fifth year students. When the time came, however, it struck me that I might as well sit for the examinations so as to see what kind of questions were asked, and in this way perhaps obtain a good place in my fourth year.

When I read the examination paper I could recall vividly my notes as if I had the notebook at my side. I wrote and sent in my papers. To my great astonishment, and that of the other students, at the end of the session my name was read out first with 83 per cent. of marks. Lister made it a rule to present a prize to the man who came out first, and the prize was always a case of silver catheters. After an interview with me, at which he presented the catheters, he offered me an appointment as dresser during the summer (1873). This was followed by a clerkship during the following winter, his house surgery at Edinburgh in 1876-1877, and a similar post in 1877-1878 at King's College Hospital. Subsequently I became one of his private assistants, the other being his nephew, the late Sir Rickman Godlee. It was a wonderful time, and we three worked together with the greatest interest and unanimity till at last the time came when Lister gave up private and hospital practice.

I often marvel at the inspiration which caused me to attend Lister's clinical lectures in the winter of 1872-73, and at the extraordinary good fortune which led me, a shy, uncouth youth, without any influence or money, to become intimately associated with one of the greatest men who has ever lived; with one who entirely revolutionized surgery and who has done more for the relief of suffering and for the saving of life than anyone else. With it all he was a man of extreme modesty, full of generosity and sympathy with the afflicted. Truly he was a man without guile and venerated by all who were closely associated with him. I think that most of those who were intimately acquainted with him had a feeling of awe in his presence; for my own part I never lost it. He seemed so far above us, and he had achieved such a wonderful revolution in surgery.

It is curious how events and discoveries fit into their proper place in the history of the world, and how one discovery may often dovetail into another and increase the usefulness of both. I have in my mind at the moment the discovery of anæsthesia and asepsis.

Anæsthesia alone was naturally a very great gain to mankind both in saving pain and in reducing shock, but in some respects it was a disadvantage. Before its introduction, the hall-marks of a good surgeon were rapidity in operating and thorough anatomical knowledge. The range of operative work, however, was not very great. But the fact

that pain could be abolished and shock considerably reduced by anaesthetics had the effect of encouraging surgeons to perform more prolonged and intricate operations. The consequence was that, as sepsis was as frequent and as dangerous as before, there was an increase in the number of cases of sepsis and in the mortality in the surgical wards, and surgeons became more doubtful than ever of the advisability of extending the area of surgery.

As soon, however, as Lister had established his aseptic methods, this difficulty passed away; rapid and enormous extensions of the limits of surgery were introduced by him and his followers, and anaesthesia took a permanent and most important place in forwarding this.

The times were indeed ripe for the revolution made by Lister in the treatment of wounds. For ages, those who practised surgery were constantly confronted by the various septic diseases following wounds, whether made accidentally or by the surgeon. Occasionally, some one had a glimpse of the truth, but the wound treatment, whatever its nature was, had as its object the application of dressings and medicaments in order to make the flesh heal, as opposed to Lister's principle of leaving the wound itself alone while striving to remove all agencies which might hinder the wound from healing.

The cause of the septic troubles was for long looked on as connected with the admission of air to the wounds, and when oxygen was discovered, that gas was generally blamed for setting up changes in the blood and tissues. But towards the end of the eighteenth century John Hunter pointed out that it could not be the gases in the air which caused harm, for in cases of emphysema and pneumothorax due to fracture of a rib and puncture of the lung, the tissues and the pleural cavity became distended with air; but neither sepsis nor suppuration supervened. Therefore Hunter was in favour of abolishing the masses of dressings which were most in vogue in those days, and contented himself with applying a piece of dry lint over the line of incision and encouraging drying of the lymph and blood – that is to say, healing by scabbing. His example was followed by others, who tried to aid scabbing still further by blowing warm air over the wound at frequent intervals, or by the use of powders, dusting the line of incision with them.

About the same time Abernethy advocated with considerable success the use of valvular incisions in removing loose bodies from joints and in opening psoas abscesses.

At the beginning of last century, subcutaneous surgery was introduced and Delpach elaborated it. Although its range of action was comparatively small, it still remains one of the important surgical methods.

During the last century a number of methods of treating wounds were introduced with a certain amount of improvement in results. Such methods were: open treatment, water dressing, immersion, water bath, irrigation, occlusion, &c. Just before Lister began his work, various substances, chiefly in solution, which belong to the class of antiseptics, e.g., coal tar, carbolic acid, iodine, hypochlorites, perchloride of iron, &c., were being tried, especially in France. Of these, carbolic acid was lauded by Lemaire,

but these antiseptics were only used in septic wounds; and Lemaire and others missed Lister's great generalizations which were the basis of his work.

I may mention here Lister's "slogans".

- (1) Destroy the bacteria before they enter and establish themselves in the tissues.
- (2) Antiseptics are not used as applications to the tissues of the body laid open by the surgeon, but to the bacteria which are present everywhere, in the air and on the objects around.
- (3) Let as little as possible of the antiseptic enter the wound, but do not be unnecessarily afraid of it because, so long as the bacteria are kept out, any superficial damage done by the antiseptic will be rapidly repaired without any acute inflammation or suppuration.
- (4) The failure of the previous attempts with antiseptics was due to the fact that they were applied to wounds in which bacteria had already gained a footing and, as there is very little chance of eradicating the bacteria at that stage, irritating antiseptics like carbolic acid only make matters worse.

One would have thought that these principles were clear and, when taken along with the published results, would have been very convincing. It always was a great puzzle to Lister's staff that surgeons did not rush to Lister's clinic to see his results and to learn his technique. True, there were always some foreigners, chiefly Germans and others of the Scandinavian races, present in Edinburgh, but the number of English surgeons was very small indeed. Thus, when Lister migrated to London in 1877 (eleven years after his first publication), the number of London surgeons who were using his methods or were impressed by his teaching was extremely small and could probably be counted on the fingers of the hands.

It is not easy to account for this state of matters. Among other things it was very difficult to convince surgeons that tiny pieces of protoplasm about 1/20000 of an inch in diameter could be the cause of the septic diseases, the surgeons of that day were interested in keeping up their anatomy and in acquiring great rapidity in operating, and minute germs and processes of fermentation seemed very far removed from practical work; before Lister's time, carbolic acid and other chemicals had been applied to wounds without any benefit.

Lister's statement as to what he had achieved was so contrary to the experience of other surgeons that they felt there must be a fallacy somewhere, and they were quite sure that the fault did not lie with them. They noted that Lister was constantly changing his technique and dressings, and came to the conclusion that this was because his results were not good; they apparently did not listen to his statements, viz., that he changed his dressing with the object of reducing or removing the irritation of the antiseptic and at the same time simplifying his technique. They also pointed out that primary union of wounds was not a very uncommon occurrence before Lister's time, but they ignored his statement that it was the rule in his wards; they further pointed out the disagreeable effects of carbolic acid on the hands of the surgeon and its occasional poisonous effects.

In spite, however, of these and other objections which need not be recalled, Lister went on with his work. When he retired there was little to find fault with as regards

irritation of the wounds or skin by the antiseptics, and sepsis had become a matter of the rarest occurrence when his methods were adhered to rigidly.

### III

#### **Lister Centenary Celebration.**

20<sup>th</sup> July, 1927

*By Sir Wm. Watson Cheyne.*

My Lord, Ladies and Gentlemen, - We have assembled here to-night to celebrate the centenary of the birth of one of the greatest men who has ever lived, and one who has conferred untold benefits on mankind. These benefits are not confined to any particular country or to any particular race. Thus it is that they are being attended by delegates from many nations who appreciate his work as much as we do. The man to whom I refer is Joseph Lister, who was Professor of Surgery and Clinical Surgery in Glasgow University, in Edinburgh University, and in King's College Hospital, London, a man whose work must always be kept in remembrance and whose life is an example for all.

I will say but little about his work, as it is or ought to be known to all, but I presume that among my audience there are some who have not studied medicine or surgery, and for their sakes and for the sake of clearness I feel that I must say a few words. To explain this I may very briefly refer to a very important point in the history of surgery. The fact is that from the earliest records up to our own time any wound of the skin or mucous membrane, whether caused by accident or by the hand of the surgeon, was apt to be followed very quickly by more or less serious illness, and this was worse if the injury were extensive, and still more so if bones or joints, the abdominal cavity, the skull, &c., were the seats of the injury. The fear of these diseases prevented the performance of many operations which, had these risks not existed, might have been done with the greatest advantage to the patient. These diseases were of various kinds, and are generally spoken of as "septic disease of wounds"; they are suppuration, septicæmia, pyæmia, erysipelas, tetanus and various forms of gangrene. So serious was this matter that for centuries surgeons had devoted much attention to it, but without any real advance, and many surgeons were in despair, and all sorts of attempts had been made to fathom the origin of these diseases and to find some means of coping with them.

In those days, not so far distant, it was far from a pleasure to go into a surgical sick room. For one thing there was the evident suffering which the patient was enduring, the flushed face, the tendency to delirium, and a mawkish and often very offensive smell from the discharge from the wound. Contrast that picture with the conditions nowadays. The patient is happy and cheerful with seldom any complaint of pain, and the air of the room is sweet with the smell of flowers, in fact there is nothing to offend the eye or the sense of smell, and operations which would never have been performed in former days on account of the danger to life are now an everyday occurrence. How has this been brought about? By the work of two men, Lister and Pasteur.

There was nothing accidental about Lister's work. The impulse which led to it arose while he was yet quite young. When he was attending the medical courses at

University College, London, the time came when he had to study practical surgery, and for this purpose he was appointed a dresser in the wards of Sir John Erichsen.

At that time there was an outbreak of septic diseases in Erichsen's wards, a good many of the cases belonging to the severest form, viz., phagædenic gangrene, and Lister was quite horrified with this disease. The rapid gangrene spreading from the wound, the foul smell, the high fever and delirium, the treatment by the actual cautery, and the great mortality created a profound effect on him. Lister never forgot these experiences, and the more he thought of them the more he came to the conclusion that the key to the matter lay in the putrefaction of the discharges in the wound, and when he went to Glasgow in 1860 he was constantly preaching this doctrine. His early scientific work helped him very much in this matter, especially his work on the early stages of inflammation and on coagulation of the blood.

In justice to some distinguished predecessors of Lister I must not claim too much for him in this respect. A good many surgeons previous to him had suggested similar ideas with regard to putrefaction, but they could not see any way of applying these ideas to practical surgery. It was work done by Pasteur that gave Lister the solution of the mystery, and he always acknowledged his indebtedness to the famous French chemist. Lister had been trying to get information as to the cause of putrefaction in any likely quarter, and it was his colleague, Professor Anderson (Professor of Chemistry at Glasgow University) who referred him to Pasteur's work. On perusing Pasteur's papers on putrefactive fermentation and on spontaneous generation, Lister found the information which he required in order to enable him to take up the matter clinically. This is a very interesting example of how one science may help another, and also of the value of what is often spoken of as "pure" science. Pasteur's work on putrefaction was done in order to round off his studies on fermentation and spontaneous generation. He was not thinking of surgery when he made these experiments, and had no idea that he was providing Lister with the knowledge which would enable him to revolutionize surgery, nor did he know anything of Lister's quest. Lister, on the other hand, was at that time fully occupied with surgical work, e.g., amputations and anæsthesia, and had no time to keep up with the advance of chemistry, and consequently did not come across Pasteur's work. It required someone to bring them together, and this is where Professor Anderson's suggestion proved of the highest value and enabled Lister to solve the problem.

The relative value of the work of these two great men in the early days may be illustrated by a suppositious meeting and conversation between them arranged by Professor Anderson.<sup>1</sup>

<sup>1</sup> *Pasteur*: I am told that you wish to have a few words with me as to the cause of the putrefactive fermentation of organic substances.

*Lister*: That is true and I shall be very glad if you can throw some light on the putrefaction of organic substances such as blood, dead tissues and so on. I may explain the reason why I have been most anxious to get some help from you in this matter. I may say that after an operation the blood, blood-clot and dead tissues, in fact the discharges from the wound, become as a rule extremely putrid and, do what we may, surgeons are unable to prevent this occurrence in open wounds. In subcutaneous injuries such as simple fractures no such putrefaction occurs, and conversely when this fermentation occurs in wounds it is usually accompanied by high fever and severe and very often fatal diseases of various kinds. On the other hand a subcutaneous injury, even though complicated with much bleeding into the tissues and sometimes mixed with air filtered through the lung, usually heals without any illness and without any putrefaction in the tissues. The more I ponder over these facts the more I become convinced that the illness after wounds which have putrefied is a direct result of the absorption of the putrid material and that if I could ascertain the causes of the putrefactive fermentation I might be able to prevent it, and so place the injured tissues in the same favourable position as the simple fracture.

*Pasteur*: I think I can answer your question and I hope that what I say may enable you to attain your ideal of converting open wounds into subcutaneous ones. I have for some years been devoting much attention to the subject of fermentation and I have found that all fermentations are due to the growth of minute living bodies in the fermentescible materials. Each of these groups of living bodies produces its own fermentation, but if you kill the growing microbes (as I have called them), or if you prevent the living microbes from getting into the vessel containing the fermentescible material, it remains unchanged. What is true of alcoholic, butyric, lactic and other fermentations is also true of the putrefactive fermentation.

*Lister*: My best thanks. I now know that the putrefactive fermentation is due to living organisms floating in the air, becoming deposited on surrounding objects, and very minute. I must direct my work against these microbes rather than against gases or internal derangements and other theoretical ideas. I will have to try to prevent the entrance of these living microbes into the wounds, and their growth there. It will be a very difficult matter, but, I hope, not an impossible one.

From this time forward the work was entirely Lister's. He devised and constantly improved the technique which he found necessary in order to get rid of the septic diseases. I have no time to refer further to Lister's methods of dealing with sepsis. Some of them sound very simple, but in reality it was a very laborious matter, and one which opened up many interesting and complex problems. In this work he was very much aided by his faithful and devoted wife, who rejoiced in acting as his assistant, and in writing down the experiments and their results. As he became more and more certain that his technique was satisfactory in excluding sepsis, Lister began to consider surgical cases, as they came to him, from a new point of view, viz., whether they would or would not be benefited by operative treatment. The result was the rapid expansion of surgery to such an extent as very largely to displace the physician. Lister led the van in this direction also, but his work on those lines was much obscured by the greatness of his gift to mankind by the abolition of sepsis.

In conclusion let me make some remarks about Lister himself. Lister's influence on the students was very great indeed. At the time when he began to teach surgery, the science of pathology was very much behind-hand, and medical science was full of most curious theories, which were often very difficult to understand, and so the student had to memorize a good deal of what he was told without understanding very much about it. Hence it was a very great change when Lister came with well reasoned arguments, supported by facts observed in the course of experience and confirmed by experiment. In fact, Lister was one of the pioneers of surgical pathology.

It is interesting from this point of view to record the fact that at the end of his first year at Glasgow Lister's class sent him a letter of thanks for the interesting lectures which he had delivered during the session, and expressed the earnest hope that Lister would soon be appointed on the staff of the Glasgow Royal Infirmary. When later he began his crusade against sepsis, those who attended his clinic were full of enthusiasm, and helped in every way they could.

Quite apart from the scientific work, Lister's personality had a great influence on those who were associated with him, or who attended his clinique. His beautiful gentle face radiating kindness and sympathy was most attractive, and caused a feeling of awe, as if we were in the presence of someone far above us. His sympathy with his patients, and the care with which he changed the dressings himself, were a lesson to all onlookers, and gave the patients perfect confidence, for they felt that everything must go on all right as the Professor was looking after them himself.

I have just been reading a book by Dr. J.R. Leeson, in which he gives some interesting pictures of Lister at his work. One of these pictures comes in very apropos here, and I trust that he will forgive me for mentioning it. The incident, which is not only narrated but also pictured, represents Lister coming into his ward followed by a long train of distinguished surgeons, British and foreign, and stopping at the bedside of a little girl, who had damaged her doll. She held it out to Lister, and he, falling into the humour of the scene, examined it very carefully, located the injury, asked the nurse for a needle and thread, and proceeded to repair the damage, to the great delight of the little patient.

Lister was always willing to help anyone in distress, and I shall end my little discourse by referring shortly to one occurrence in connection with Lister's migration

from Edinburgh to London. This is described in full in Professor John Stewart's first Listerian Oration. For some years Lister had been very interested in the progress of chronic spinal and hip joint abscesses. At the time when he left Edinburgh, there were seven such cases in his wards, six male and one female. Shortly after he left he heard that the Committee of Management were going to send them home, and, as the cases would not be able to obtain the antiseptic treatment, sepsis was sure to occur, and in all probability the patients would soon die. He at once had the woman brought up to London, and after a short time in the hospital he removed her to his nursing home, and she remained there for nearly two years, all expenses being defrayed by Lister. Her wounds ultimately healed, and when she was seen by Lister, fourteen years later, she was perfectly well and leading a very useful life. The six males were put in Lister's old nursing home in Edinburgh, and all but one recovered; one became a doctor and one a journalist.

My Lord, such are very briefly a few notes regarding the man, the centenary of whose birth we have met to commemorate this evening. I am very sorry that time and capacity interfere with my bringing a better picture before you. I am often chaffed for being a hero-worshipper. I am not ashamed of that, especially as my hero was Lister. Lister himself was a hero-worshipper, and his heroes were his father and his father-in-law (Mr. Syme). Where can one find a better hero than Lister, a man so earnest, so conscientious, so lovable, and so devoid of guile, and one who devoted his God-given talents to the alleviation of pain and suffering, and to the general welfare of his fellow men?