

**Remarks on the Treatment of Wounds in connexion with the Recent
Results obtained at St. George's Hospital¹**

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About a year ago in the Bradshaw lecture I went into the subject of the treatment of wounds, and pointed out what I considered to be the essential factors to be attended to in trying to obtain an aseptic result. I also ventured to criticise some of the details of the methods which are so generally employed by surgeons at the present time, and which seemed to me to be imperfect from a bacteriological point of view, and thus were apt to lead to failure in securing the desired result.

It is most unfortunate that the idea seems to have grown up that the success or non-success of the treatment of wounds depends to a large extent on the materials used, and on the method by which the sterilization of these materials is effected.

The result of this idea is that the failures in avoiding suppuration are apt to be attributed to the use of this or that material, or of this or that method of sterilization rather than to the true reason – namely, failure on the part of the surgeon to meet the bacteriological requirements of the case. Hence we have the extraordinary craze at the present time to banish the use of antiseptics, the failures being attributed to their employment and not to the real cause – namely, faulty manipulations on the part of the surgeon. As a matter of fact, efficient sterilization of the instruments, materials, &c., can be brought about in various ways, but the asepticity of the results depends essentially on the care that is taken to prevent re-infection of the hands of the operator and his assistants, the instruments, materials, &c., during the course of the operation, for if these become infected again, sepsis in the wound may very readily follow.

The discussion which is going on about what is falsely called aseptic treatment as against the use of antiseptics is utterly unscientific and misses the real point at issue. It reminds one of the early objections raised against Lister's work. Many, under the impression that the essence of it was the use of carbolic acid, began washing their wounds with carbolic acid, and naturally failed to get the desired results. They accordingly wrote and spoke against the method, but they failed to recognize that the essence of the matter was not the use of carbolic acid, but the way in which it was used. So at the present time the stress which is laid on the fittings of operating theatres, the use of masks, Rubber gloves, dry swabs, and all the other paraphernalia which are the fashion just now, is apt to overshadow the real point in obtaining an aseptic result – viz., what the surgeon is doing with his hands. It is in the manipulations carried out by the surgeon that the real essence of the matter lies, not in these various fanciful surroundings. The personal equation of the operator has more to do with the result than anything else.

¹See paper of a "Comparison between the Antiseptic and Aseptic Methods of Operation, with special Reference to the Occurrence of Suppuration, based upon the results obtained at St. George's Hospital during the years 1906 and 1908 respectively," by H.S. Pendlebury, F.R.C.S. Eng., and Ivor Back, F.R.C.S. Eng., *The Lancet*, November 27, 1909, p.1578.

There are certainly two schools at the present time, but the essential point of difference is not whether use should be made of antiseptics in the course of an operation or not. The essence of the question at issue is whether the treatment of wounds shall be looked upon as a bacteriological problem or not. On the one hand we have those, among whom I may include myself, who look on the treatment of a wound as a bacteriological problem of a complex character and who take advantage of anything which aids in fulfilling the bacteriological requirements of the case, not forgetting, of course, that the tissues themselves have to play an important but secondary part. The other school looks on the action of the tissues as the essential element and the bacteriological question as of secondary importance. They try, therefore, to irritate the tissues as little as possible, and sacrifice various things which would be of value if the case were regarded as a bacteriological problem. In doing so they are apt to be led away by the non-essential surroundings, and forget what an element the personal equation plays in the result. It is, I fear, too often a case of keeping the outside of the cup and platter clean. In my opinion, this view is a very serious fallacy, and the essential point is what the surgeon does with his hands during the operation, and not the surroundings in which he operates.

I have felt certain for a long time that the results obtained by those who endeavour to do away with the use of antiseptics, and who rigidly employ what is falsely called the aseptic method, cannot be compared with those which are got when the treatment of a wound is looked on as a problem in bacteriological work and when the surgeon acts accordingly. Till recently, however, I had no actual statistics at hand as regards the frequency of suppuration in wounds treated by the recent methods, and consequently I have always felt that, though I was right, my argument was not altogether convincing, seeing that I could only speak generally. This difficulty has, however, been remedied by the publication in the *Lancet* of November 27, 1909, of the results of the so-called aseptic method which have been obtained at St. George's Hospital.

Before, however, I go on to refer to these results I may mention a few of the points on which my conclusions adverse to this method were founded. In the first place, this so-called aseptic method, with its sterilizers, boiled water, heated towels, dry swabs, dry dressings, saline solutions, masks, &c., is full of loopholes, and does not in any way meet the bacteriological requirements of the case. To wash the skin with soap and water, even though the water is boiled, and then rub it over with a 1 in 500 solution of biniodide of mercury and spirit, is not in any way a reliable method of sterilizing the field of operation. To lay instruments on a dry sterilized towel, and to work with them for perhaps half an hour, or an hour or more, without re-sterilizing either them or the hands of the surgeon or his assistants, is utterly opposed to any real attempt at keeping wounds aseptic. To wear the same overall during a whole afternoon's operations, even though it was sterilized in an autoclave in the first instance, is hardly consistent with asepsis. To put on this sterilized overall after the hands have been washed but before they have been disinfected, as is so often done, is to infect it at once, still more so to put it on and then subsequently arrange blankets, &c. What bacteriologist would ever dream of carrying out his work under such conditions? No doubt the answer is that the tissues themselves have a great power of dealing with organisms which come in contact with them, provided that the latter are not too numerous or too virulent, and provided that the tissues themselves are very tenderly dealt with, so as not to impair seriously their power of resistance. This is, no doubt, to a certain extent true, and very fortunately so, but one must not try the tissues too far, or place too much reliance on

their action. The less the tissues have to do in the way of destroying bacteria the greater the probability, and, I may even say, the certainty of securing an aseptic result.

As regards the imperfections of these methods I also judge by the way in which many nurses who have been trained in hospitals where these plans are carried out act at an operation as indicating the training which they have received and the ideas which they have gathered from it. Nurses are always using the term “sterilized” and “aseptic”, but the majority of those whom one comes across in private practice have no real conception of their meaning. Ask a nurse who is wearing rubber gloves which have been well boiled, and who has perhaps been washing sponges in sublimate solution, and whose gloves are thus perfectly aseptic, to come and hold a retractor. What is the first thing she does? Instead of coming promptly she rushes off to a tap or basin of water and carefully rinses off the antiseptic and soils her gloves, and then comes beaming with satisfaction at having demonstrated how thoroughly aseptic she is. Her annoyance when I decline her assistance after this performance cannot be concealed, and she evidently regards me as an extreme faddist and quite behind the times. Only quite recently I had two “aseptic” nurses to assist me at an operation, who, having by my direction boiled some towels to surround the area of the operation, and not having a basin at hand, placed them in the commode till they were required! I could fill pages with the absurd errors which I have seen and which would be highly amusing if they did not imperil the well-being of the patient. One would have expected that, coming from a hospital where these difficult aseptic methods are employed, the nurses would have been especially thoroughly drilled in the extreme care that it is necessary to exercise in every direction during an operation if there is to be any certainty of success as regards the occurrence of sepsis. But, on the contrary, I find that so long as the instruments or materials have been immersed in boiling water, for however, short a time, or heated in one of the imperfect sterilizers which are on the market, everything is all right, whatever may have happened to these things since they were prepared.

Further, I frequently hear the experience of medical men who have been visiting hospitals abroad and at home where this treatment is carried out, and their reports of the aseptic results as obtained by the modern methods are not particularly favourable, and they constantly express themselves puzzled as to how we obtain the results which we do at King’s College Hospital, where our operating theatre cannot be said to be in any way a model of a modern operating theatre.

I have also been very much impressed by what one hears of the difficulty of sterilizing ligatures, skin, &c., and of the frequency of stitch abscesses (I have known a large collection of pus in the pelvis after a clean ovariectomy spoken of as a stitch abscess), things which very seldom come under our notice, and I have been especially struck by the incredulity which is evident when, in discussing these matters, I have said that I have had little or no experience of them. The conversation is at once dropped, evidently from a desire not to lead me to imperil my immortal soul by further perjury. As an example of this point and the results generally obtained in Germany, I was very much interested, in reading Bier’s “Text-book on Hyperæmia,” to come across the following remarks on p.287 in the English translation. In speaking of the treatment of infected wounds he says:-

“Not infrequently laparotomies which cannot be executed aseptically and even radical operations for hernia, are followed by a mild small infection leading to the formation of sinuses.”

And again, on p.334, in the course of some remarks on the prophylactic treatment of wounds suspected of infection, he says:-

“In connection with this experience (the failure of the hyperæmic treatment in some cases) are experiments which I have undertaken with a view to change the aseptic treatment of wounds. It would be incredibly foolish for a surgeon to question its brilliant accomplishments. But in spite of asepsis, we have not yet progressed so far that we can guarantee with certainty the healing by first intention of all wounds adapted to suture. How often, for example, does it occur that silk threads are expelled, or that a wound which on the whole has healed by first intention shows small defects (stitch abscesses, sinuses)!”

These are to me astonishing statements and what astonishes me most is the matter-of-fact way in which these failures are spoken of, as if they were every-day occurrences. If I had a “small defect” in a wound I should be very seriously unhappy, and should not rest till I had tried to find out what was the error which I had committed.

The result of these experiences is manifested in various ways. Thus we have many surgeons objecting to buried sutures for the reason that they are very apt to be extruded. We have, again, various devices for bringing together the edges of the skin so as to avoid if possible the occurrence of stitch abscesses. We have the abandonment by surgeons of many useful materials, such as catgut, marine sponges, &c., on account of the supposed difficulty in disinfecting them, the idea being that nothing but heat is a trustworthy disinfecting agent. To show how this fear of the danger of infection, which can only be inspired by experience, affects the conduct of an operation, I may mention that I have more than once had remarks made to me by distinguished visitors as to the mode in which I deal with the sac in performing radical cure of hernia. In the great majority of cases, for reason which I need not go into here, I twist the sac and push it upwards under the abdominal wall, and the objection that is made is that in leaving a sac so tightly twisted as I do I am leaving a piece of dead tissue which will lead to suppuration. I can only say that in my experience this has not occurred, and that even if it were dead, which I doubt, to leave a piece of dead tissue, provided that it is aseptic, is a matter of little or no consequence from the point of view of infection, provided the measures employed for keeping out bacteria are really efficient.

In yet another direction I notice the way in which the experience of those who employ this aseptic treatment affects their practice – viz., that they hesitate in doing things which can readily be done safely and which ought to be done. For example, quite recently a distinguished orthopædic surgeon, in speaking of “tuberculous abscesses,” stated that “numbers of children die in consequence of the routine opening of tuberculous abscesses,” and he holds that better results are obtained if these abscesses are not, as a rule, dealt with at an early period. This is quite contrary to our experience, and is, to my mind, only another example of the failure of the so-called aseptic methods. That these methods should fail in such a condition as a psoas abscess is only what one would expect, because there we are dealing not with an opening in the tissues, lined by healthy tissue with its strong antibacterial powers, but with a

cavity containing putrescent material, the walls of which are themselves composed in great part of degenerated, devitalized tissues. That is just the sort of case where we would expect failure and it is evident from the passage I have quoted that this expectation is correct. On the contrary, the success obtained by dealing early with psoas abscesses was one of the points of which Lord Lister was always most proud, and we, who have been his immediate pupils, find that this success can still be obtained even to a larger extent than formerly.

I have referred to the results obtained at St. George's Hospital, as published in the *Lancet*, November 27, and I may now make a few remarks with regard to them. In the first place, it seems to me that the gentlemen who collected the results are quite satisfied with them, and in fact they end their paper by saying that "We hope that these statistics will prove useful and of interest to the practitioner, and help him to give a patient a fair idea of the average chance of aseptic healing in the commoner operations." The main object of the paper appears to be to contrast the results which they obtained at St. George's Hospital in the first place when they employed antiseptics, in what way is not exactly stated, and in the second place since some alteration was made in regard to the use of antiseptics. It is not really clear from the paper what the alterations were, but in any case the results as obtained in 1906 by the methods then employed, which they speak of as antiseptic methods, were 13.6 per cent. of septic cases, falling in 1908 under improved methods to a percentage of 7.2 per cent. of septic cases. As the details of the two plans are not fully given I cannot criticize them, but it strikes me that probably the whole difference in the results is accounted for by the fact that in the second period nearly all the surgeons used rubber gloves; in the earlier period this was apparently not the case. There is no doubt that boiled rubber gloves are of the greatest value where the methods of disinfection of the skin, and especially of the hands, are faulty, and I believe that this point forms practically the essential cause of the difference between the results in the two years which are contrasted and not the question of the use or disuse of antiseptics.

The authors, in addition to mentioning the total cases, refer especially to five groups, and these show very interesting results. Taking the 1908 statistics, the class of cases in which the best results are noted was apparently operations for quiescent appendicitis where the percentage of septic cases is only 3.3 per cent. This agrees with what we are now thoroughly familiar with – namely, that the peritoneum has a power of dealing with bacteria which may come in contact with it in a way which is not equalled by any other tissue of the body. The opposite extreme is given by the operations on the breast, where the percentage of septic cases reaches the large amount of 12.2. This result is exactly what I should have expected. Operations for cancer of the breast are extensive operations and take a very considerable amount of time, and thus on the one hand ample opportunity is afforded for infection of the wound where no sterilization of instruments or hands, &c., takes place during the course of the operation, while the tissues which are dealt with have not nearly the efficacy as bactericidal agents which the peritoneum has.

I think that Mr. Pendlebury and Mr. Back are to be congratulated on the very careful way in which they have gone into the hospital records and on the very fair way in which they have stated the results which have been obtained. In my opinion, however, if these are the best results that can be got from the recent septic methods the sooner they are abandoned and their place taken by a line of treatment in which the main

attention is paid to the bacteriological problem, the better for the well-being of the patient and the ease of mind of the surgeon.

I may say that the paper to which I am referring has created a great deal of interest and excitement among the junior staff (house surgeons, &c.) at King's College Hospital, and I was very much gratified to find that on their own initiative, and without any suggestion on my part, they had gone into the results which have been obtained in my wards since the beginning of 1901, and to my surprise and pleasure I have received from them complete and very carefully worked out statistics of all the clean cases on which I have operated during that period, the results of which I have verified and shall now produce. I may say that these statistics have been put together on the same lines as the statistics at St. George's Hospital, which I consider to be the correct ones – that is to say, they are only statistics of clean cases; in other words, of cases where the surgeon had unbroken skin to start with, and where in the course of the operation he did not have to open any mucous cavity, not did he come into contact with any focus which was the seat of septic infection. For example, intestinal resections, gastroenterostomies, operations on the gall-bladder and bile ducts, renal calculus, &c., are excluded, and of course all operations on the rectum, bladder, urethra, mouth, throat, abscesses, septic sinuses, &c. I am very much struck by a large proportion of these cases as contrasted with “clean” cases which occur in one's hospital work.

The numbers work out at a total of 1,028 clean cases operated on during the eight years, and of these 19 are classed as becoming infected. It is, however, very doubtful whether several of these 19 cases should be included, as I shall mention immediately.

	Cases	Infected	Percentage of infection	Percentage of infection in the St. George's Hospital cases in 1908
Radical cure of hernia	235	4	1'7	9'6
Excision of the breast	112	2	1'8	12'2
Operations on the thyroid gland...	28	0	<i>Nil</i>	6'2
Operations on the male genital organs	51	2	4	6'5
Operations for quiescent appendicitis	89	1	1'1	3'3
Miscellaneous	513	10	1'9	6'3
Total	1,028	19	1'8	7'2

Dividing the cases into classes as in the St. George's Hospital statistics, the numbers come out as above.

The miscellaneous cases include, for example, 91 operations on bones (recent fractures, ununited fractures, deformities, tumours, such as exostoses, &c.), 17 operations for tuberculous disease of bone where there was no external opening, 31 operations on joints (chiefly displaced or loose cartilage), 17 operations on

tuberculous joints (arthrectomy, excision, &c.), 32 clean laparotomies (ovarian tumours, enteroptosis, explorations, adhesions, &c.), 14 amputations (excluding amputations for gangrene), 73 operations for tuberculous glands (all very extensive and prolonged operations), 22 operations for malignant glands, 20 operations on the kidney (nephropexy and nephrectomy), 17 cases of spinal abscess, 80 operations for varicose veins (usually five or six wounds in each case), and a variety of other cases.

From the above figures it will be seen that there is a very marked difference between our results and those obtained at St. George's Hospital. Had the results been the same as in that hospital, instead of 19 septic cases, we should, according to their 1906 statistics, have had 140 septic cases, or, according to the improved results of 1908, the numbers ought to have been 74.

Apart from mere numbers, it is interesting to note why and when the cases became septic. I shall therefore run over the various cases.

Hernia (4 Cases)

- (1) Case of large ventral hernia in a very fat woman; a drainage-tube was inserted at the time of the operation. In this case there was no sign of infection till the ninth day. No doubt the infection in this instance entered through the drainage-tube subsequent to the operation.
- (2) Case of large ventral hernia in a woman. Here the course at first was quite aseptic. The wound was dressed and the stitches removed at the end of a week; on the sixteenth day the dressing was again changed and a collection of serum was seen to be present. A tube was therefore inserted. Three days later the fluid coming from the tube was somewhat turbid. No doubt infection through the tube.
- (3) A little child, aged 2, with strangulated hernia and muddy fluid in the sac. He also fouled his dressings. Slight suppuration. It is a question whether this case should be included among clean cases, as we know that in a very short time after strangulation the fluid in the sac contains bacteria.
- (4) Also a child and also soiling of dressings. In this case I had to remove the deep stitches before healing occurred.

Male Genital Cases (2 Cases)

- (5) Case of boy with undescended testicle, in which I brought down the testicle and secured it to a wire cage by a stitch passing through the lower end of the scrotum, in the manner which I described some years ago. When this stitch was removed ten days later there was a drop of pus at the point of exit. Immediate healing.
- (6) Hydrocele and hernia. Sac of hydrocele dissected out and radical cure for hernia. Drainage tube put into the lower end of the scrotum, but in spite of that a considerable hæmatoma formed. Drainage tube left out after eight days. At the end of fourteen days blood-clots with which some pus was mingled were squeezed out. Here sepsis through drainage-tube subsequent to the operation. It is very difficult to prevent infection when a tube has to be kept in the scrotum for several days.

Quiescent Appendicitis(1 Case)

- (7) Operation three weeks after a severe attack of appendicitis. First dressing and stitches removed on the tenth day, when some accumulation was found in the wound which necessitated daily dressings for about ten days. The registrar's notes state that it was septic.

Excision of the Breast for Cancer (2 Cases)

- (8) The operation was performed on November 22. First dressing and tube left out on 24th. Next dressing and stitches removed on December 1, when the wound was healed and everything looked healthy. On December 7 some purulent discharge was noticed coming from the wound which on examination was found to contain staphylococci. Probably a collection of serum in the wound which had become infected through a stitch track.
- (9) Here the tube was left out on the second day. At the second dressing on the sixth day some pus was found and the tube was reinserted. The sepsis was quite mild, the temperature only once reaching 100.4°.

Miscellaneous Cases (10 Cases).

(10) Intermittent hydronephrosis, in which I performed the plastic operation on the pelvis of the kidney, described to me in the Lancet in 1907. The wound healed well, and we were about to discharge the patient when, twenty-five days after the operation, he was jumping about in bed (it was Christmas time), and suddenly felt severe pain in the loin This was followed by fever and the formation of a swelling, which, when opened, was found to contain urine and pus. It quickly healed with drainage. I think that during his violent movements some point in the line of union of the pelvis of the kidney gave way and urine was extravasated. I doubt, however, whether this case should come among clean cases. The urine was not examined bacteriologically before the operation, but we know that in many of these cases bacteria are present in the urine.

(11) Bad club-feet in a child. The astragalus on each foot was removed. Both sides healed by first intention, but on one side a little point in the scar broke down on the twelfth day, and was some days in healing. At this point the skin had been a good deal bruised by the retractor, and if organisms were really at work in causing the breaking down (there was no suppuration) they probably entered through the injured skin rather than at the time of the operation; indeed, it is doubtful if this case should be included among the septic cases.

(12 and 13) Two cases of tuberculous glands in the neck. One of these cases had acute tonsillitis at the time of the operation, and there is a note by the registrar that the glands when removed were infected. There were also difficulties with the anæsthetic, and the administrator's fingers and the saliva were dangerously near the wound. In the other case, infection must have occurred at the operation, as pus containing streptococci was evacuated on the second day.

(14 and 15) Two cases of operation for ununited fracture of the femur. In both cases drainage tubes were used. In one the wound went on quite well till the tenth

day, when the dressings were soiled with an enema and fæces, and this fact was not at once reported. Suppuration, though limited in amount, occurred. In the other case the right femur had been fractured about its middle on three different occasions, and there were great deformity, stiffness of the knee, and a large swelling at the seat of fracture. The operation was very extensive, and was accompanied with a good deal of bleeding. Two deep-seated vessels could not be tied readily, and it did not seem advisable to prolong the operation. Hence Spencer Wells forceps were left on the bleeding points for two days, the wound remaining open at that part. Suppuration was evident on the fifth day. Considering all the difficulties of the case this result is not surprising.

(16) Excision of the elbow-joint for ankylosis after acute osteomyelitis of the humerus five years previously. For three and a half years sinuses had remained open, and various operations had been performed for the removal of dead bone. These sinuses had, however, healed eighteen months before the present operation. Suppuration was evident on the fifth day.

(17) Excision of hip. This was a case of excision in a man who had a most remarkable series of deformities in the way of stiff and distorted joints after an acute illness. There were numerous pustules on the skin, and it was very difficult to keep him clean; in fact, the operation was delayed so as to let the pustules heal. The hip was excised so as to give him movement in one joint and a drainage-tube was inserted, but the wound suppurated.

(18) Tuberculosis deposit in lower end of the tibia. This was the case of a tuberculous deposit in the lower end of the tibia, which was thoroughly cleared out, and the large cavity in the bone was filled up with large pieces of decalcified bone. These were supplied by the instrument maker in alcohol, and were used as delivered. Sepsis at once occurred, but the wound healed rapidly after removal of the decalcified bone.

(19) Stitch abscess after nephropexy. Wound closed without drainage. Stitches removed on ninth day; there was pus along the middle stitch tracks.

Analysing these cases, we may note in the first place that it is very doubtful whether two (Nos. 3 and 10) really come under the category of clean cases; however, as they have been given to me, I put them in. In one (No. 11), the sepsis was doubtful. In No. 12 the glands were probably infected at the time of the operation. In three of the cases sepsis followed soiling of the dressings with fæces and urine (Nos. 3, 4, and 14). Further, it may be noted that in many of the cases the sepsis was very slight, and in none did it lead to any serious consequences; in fact, I may say that none of the 1,028 clean cases died.

A point of importance is that in seven of the cases (Nos. 1, 2, 8, 9, 14, 15, 17) drainage tubes were inserted at the time of the operation. In very fat people (*e.g.*, the ventral hernia cases), and in very large wounds (*e.g.*, breast cases) I think it is advisable to introduce a drainage tube for a few days, so as to prevent the collection of serum which is otherwise apt to form. This, however, increases the septic risk because it means several dressings, and at each of them septic infection of the tube may occur unless the dresser is very careful. In our list there were seven cases in which infection

showed itself late, and in six of these it, in all probability, entered through the drainage opening, and not at the time of the operation.

Cases of sepsis after wounds fall under two heads – viz., those where infection takes place at the time of the operation, and those where it occurs afterwards. In the above list, the cases where the infection almost certainly occurred during the operation were six in number – viz., 7, 12, 13, 16, 17 and 18. This gives an operation sepsis of 0.6 per cent.

A most important point to be noted is the conditions under which these results were obtained. In the first place we have only one operating theatre, used by all the surgeons and for all cases, septic or otherwise, and also used for lectures. Our theatre is very much as it was built and fitted out some sixty years ago. With the exception of a tessellated floor, we have none of the modern arrangements; in fact, I expect it is the worst operating theatre in any of the large London hospitals.

Another and very important point is that the after-dressing of the cases is left to the house surgeon; indeed, in most cases, if I have a very full afternoon, I leave the stitching up of the skin wound to the house surgeon while I get on with the next case. Of course a house surgeon, however, excellent, is only a beginner, and to him the precautions necessary to procure an aseptic result are not yet automatic; he has constantly to think what he is about from an aseptic point of view, and I think it is very remarkable that the number of septic cases has been so few, when we remember that the men change every six months, and that during these eight years there have been seventeen house surgeons and sets of dressers. Fortunately, there is a very healthy spirit of rivalry among our house surgeons. We have three house surgeons, one for each full surgeon, and they are very strong partisans, each trying to show better results than the others. When a house surgeon takes up his appointment he sets two chief aims before him. The first is to put a larger number of cases through his wards than the others, and the second to show better results, more especially as regards asepsis. With the first aim I have no sympathy whatever. I do not see why I should be overworked simply in order that my staff may crow over the others. The second aim, on the contrary, I encourage in every way. It means that the men take their work more seriously; it develops habits of care and thoughtfulness, and it trains them to regard the aseptic treatment of wounds as a matter of paramount importance. Each faction watches the others most closely, and if suppuration, however, slight, occurs in any case we very soon hear of it. I venture to think that this is a spirit which should be very carefully fostered. Without it, indeed, I could not leave the after-treatment of the wounds to the house surgeon with any degree of comfort.

I may also draw attention to one point which shows very convincingly to what an extent the asepticity of the results depends on the personal equation. The cases were given to me arranged in years, and I find that in four of these years there was 1 septic case each year; in two years there were 3 septic cases each year; in one year there were 4 septic cases; and in one there were 5. These two years in which 9 septic cases occurred, nearly half the total, were consecutive years, and for a time I was puzzled to account for this large proportion of failures. It occurred to me, however, to note the dates of admission of these 9 cases, and I then found that 7 out of the 9 occurred under the care of one house surgeon. As I had seventeen house surgeons during these eight years, this leaves 12 septic cases to be distributed among sixteen men. As a

matter of fact, several house surgeons had no septic case during their term of office, some had one case, and some had two.

I do not put these results forward as an example of the best that can be obtained; in these cases much has been left to beginners, and I think they are to be congratulated on the careful way in which they have done their work. But as experience and skill increase, the precautions necessary to secure an aseptic result become more or less automatic; one feels instinctively if anything is wrong, and failures become more and more only the result of accidents.

One other point is shown by these facts – viz., that the extravagant amounts which are sometimes expended on operating theatres, fittings, &c., are to a large extent unnecessary. I have no objection to a nice, well-fitted operating theatre at all, but things are sometimes carried to an extreme, and the operating theatre is apt to assume an undue importance in the eyes of those using it. Our operating theatre and arrangements cannot compare for a moment with those at St. George's Hospital, and yet they get four times as much sepsis as we do.

I think that the above facts show that there is a great deal more in the treatment of wounds than simple cleanliness and the avoidance of irritation. I do not believe that a surgeon will get the best results unless he takes the view that suppuration in clean wounds is avoidable, and that the way to avoid it is to look on the treatment of a wound as a bacteriological problem, and to act accordingly.