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

contact with the wound is sterilized by heat; heat-sterilized salt solution is used as a lotion; heat-sterilized cotton swabs are used for sponges; and a heat-sterilized cotton dressing is applied to the wound. I am at a loss to know how this type of surgeon sterilizes his hands, or the patient's skin, because if he uses the harmful chemical he ceases to be consistent, and becomes what I suppose would be called an antiseptic surgeon. One who writes somewhat vauntingly about his so-called aseptic surgery nevertheless uses strong chemicals for his ligatures; and, furthermore, transfers the ligatures straight from the chemical into the wound.

The other school is consistent, for it applies the word aseptic to the end and not to the means. To gain the end both heat and chemicals are utilized. Perhaps in the future science may provide some method of sterilization as yet undreamed of. This school, to which I belong, will apply it to the end in view—sterility—and continue to speak of aseptic surgery. Should the other school use the new discovery they will have to invent some new name for their new method. We are, perhaps, living too near the great revolution in surgery to be able to take a dispassionate view of the question. The voices of those who threw doubt upon the teaching of Lord Lister may still be ringing in our ears. But, assuredly, in the future it will be assumed, as a matter of course, that all surgery is aseptic; and then surgeons will cease to speak of "aseptic surgery" or of "antiseptic surgery" as though wishing to imply that they alone dealt in a special brand of superior excellence. But even in that golden age it may be that, after suitable tests, the ultimate result will be called septic or aseptic. For even then sepsis will sometimes occur. All the bacteria will not have died of senile decay.

It may be readily granted that ideal perfection would be reached if asepsis could be attained without the use of chemicals. Nay, I will go further and say, as I have often said before, that the more efficaciously heat is used to sterilize instruments, lotions, materials, and dressings so much the more can we dispense with the use of chemicals. It is, however, difficult to conceive how they can ever be dispensed with in the disinfection of the skin. To sterilize on a large scale the lotions, sponges, materials, and dressings entails an elaborate equipment and organization. A special scheme of architecture and system of ventilation are required merely to improve the atmosphere. A reasonable outlay is justifiable to attain these ends. Asepsis must be easier to attain under such conditions, and the proportion of sepsis ought theoretically to be less.

In this country several elaborate and expensive installations have been started with these ends in view. It will be most instructive to have detailed reports of the results. These reports should not be based upon opinion, but should tell us exactly what proportion of sterility was obtained.

The atmosphere with its swarms of bacteria must of necessity vitiate the results of the consistent aseptician. Reluctant to bring chemicals into contact with wounds, he is compelled to strive for a germless air. If it were found that the attempt was successful, then the elaborate and expensive precautions would be fully justified. But what if the air showers bacteria into wounds unprotected by either antiseptic or disinfectant? Are we now to put our trust in the assumed harmlessness of atmospheric bacteria, or are we to confide in the germ-killing powers of the tissues and fluids of the body? Obviously no combination of glass, brass, and marble can ensure a germless atmosphere. So what provision does the consistent aseptician make for the destruction of atmospheric germs? Surely his aim is to keep out all bacteria, or does he pretend to separate the harmful from the harmless, allowing the latter to enter and keeping the former outside? It is impossible for me to conceive that an open wound is germless. When it is closed some bacteria must be imprisoned in its depths, unless some steps be taken to wash them out or compass their destruction. One would imagine that it were easy to be sure whether a wound was septic or aseptic. But even such a straightforward question is difficult to answer. One observer³ has tested cases of laparotomy at various stages of the operation. Culture media were inoculated from the wound and from the peritoneum at the beginning, the middle, and the end of the aseptic operation. Bacteria were constantly present. They were most numerous in long operations involving much manipulation. Döderlein opines that most of the bacteria come from the hands and person of the operator, some entering by contact, and some through the air.

It seems to me irrational to make no attempt to get rid of these bacteria, especially when there is a reasonable possi-

bility of washing them out or of killing or attenuating them with dilute chemical solutions. It is true that the wounds which Döderlein tested healed by first intention. But laparotomy wounds are not the most stringent test. The fate of a breast wound in which a haematoma had formed might have been very different. Buried silk sutures, too, might reappear in a mysterious way from these microbe-haunted wounds. To my mind such observations as these are arguments in favour of the rational and moderate use of chemicals.

Pray do not suppose that I wish you to infer that by any use of chemicals all the evils of an infected atmosphere can be overcome. In our cities a large expenditure is justifiable to improve the quality of the air supplied to the wards and operating theatres of our hospitals.

It is so well known that the air of ordinary operating theatres contains bacteria that it is unnecessary to recapitulate the evidence. I should now like to hear what is the condition of the air in those new theatres into which purified air is driven. Perhaps an elaborate bacteriological report has been issued, but, if so, I regret that I have not seen it yet. Such a report would be of great value to those who contemplate the adoption of this system rather than that which relies upon extraction, aided by the occasional introduction of steam.

I wish the results of bacteriological tests could be laid before you in every case, but it has only been practicable to carry them out in hospital practice. Therefore the success or failure of the methods has had to be judged by the way the wound healed. But it will be observed that the slightest amount of suppuration, even of a minute part of a wound or of a stitch, suffices to place it in the septic class. It may be that the sepsis was too slight to injure the result, but that is not the point: the patient ran an unnecessary risk. Some fatal cases of sepsis have very small beginnings.

What constitutes an aseptic case? Our ideal is one in which all the sponges, towels, materials, instruments, skin of the hands, skin of the patient, and the wound itself are all sterile when tested with culture media. This stringent ordeal entirely puts aside the personal idiosyncrasies of the operator. If it were in common use we should not hear of a septic discharge called a little turbid serum, or of such an absurdity as non-purulent pus.

It is our endeavour to have the wound tested with culture media when the dressing is removed. Except when a drain is left in to provide for the oozing of blood, the first dressing is done on the eighth or tenth day. As a rule a piece of one of the skin sutures is dropped into the broth. Hitherto a very minute proportion of wounds have withstood this stringent ordeal. Theoretical perfection is exceedingly hard to attain; but the effort to attain it has a most excellent disciplinary effect. When house-surgeons, dressers, and nurses know that their towels, sponges, dressings, silk, catgut, and skin may at any time undergo the stringent test of culture media, they apply themselves with great earnestness to carry out with exactitude the directions of the surgeon. The surgeon, too, does his best to sterilize his own hands when he knows that their state of sepsis or of asepsis will be accurately revealed. I need hardly add that he will avoid introducing infection into the wound with as much care and accuracy as if he were dealing with culture media; in fact, he ought to remember that he is performing a delicate bacteriological experiment.

To my mind this experiment is rendered fallacious by two things: first, the uncertain disinfection of the skin of the patient, of the surgeon, and of his assistants; and secondly, by the condition of the atmosphere in which he works. It has become too much the fashion to ignore the dangers of aerial infection. Perhaps we shall arrive at an explanation of some of our contradictory results when we have accumulated enough scientific information regarding all the conditions under which operations are performed.

A culture tube of nutrient broth is a very delicate test. If we were working without chemicals it might be absolutely relied upon. No chemical need be introduced with silk, towel, or silkworm gut, for they can be conveyed straight from the sterilizer into the broth. But a certain quantity of antiseptic clings to the bits of skin removed from the fingers of the surgeon and of his assistant and from the margins of the wound, and some clings to the sponge. The catgut probably contains a relatively large quantity. The presence of a minute trace of a diluted chemical does not render the tests absolutely valueless. In spite of its presence a percentage of test objects infects the broth. Being very dilute, and in exceedingly minute quantities, it probably cannot

exert more than a retarding influence upon bacterial growth. Inasmuch as the tubes are incubated for a week at body temperature, there is time for the bacteria to grow in spite of the presence of the minute trace of chemical. For some time we tried to neutralize the biniodide of mercury upon the test object by dipping the bits of skin or of sponge into a solution of ammonium sulphide. There was no increase in the proportion of infected broth, and therefore the unpleasant sulphide was discontinued. I think most will concede that although our present tests may not be perfect, nevertheless they are infinitely better than none at all. At all events, since they have been instituted there has been a marked improvement in results. I am endeavouring to get our bacteriological department to undertake independent and stringent tests of their own. Further, may we not reason thus? If the chemical which clings to the skin prevents the skin from infecting culture media, may it not also prevent the skin from infecting the wound? Surely it is reasonable to suppose that skin saturated with the antiseptic is less likely to infect than skin which is not. Chemicals will kill spores or bacteria in time, but in surgical practice they are used under the most disadvantageous conditions. Sublimate, for instance, is rendered inert by the albumen and salts with which it comes in contact. I am quite sceptical as to the possibility of disinfecting an infected wound. Indeed, it is hard to imagine any one more helpless than a surgeon confronted with a septic wound. He cannot cure, and his best efforts may not alleviate. If the septic wound could with certainty be made aseptic, surgery would have made another vast advance. On the other hand, although we cannot disinfect with chemicals, yet we possess several which, even in extreme dilution, act as antiseptics, and can be relied upon to protect the hands, the wound, the instruments, and materials from aerial infection. I cannot myself observe that the dilute antiseptic solutions have the slightest appreciable malign influence upon the tissues. Therefore it seems to me irrational to leave bacteria within a wound when there is a possibility of washing them out with a weak and harmless chemical solution.

The search for the ideal chemical antiseptic and disinfectant is as arduous as the quest of the Holy Grail. It is easy, as I have said, to find a chemical which, in weak and harmless solutions, acts as an antiseptic, but it is quite another matter to find a chemical disinfectant. The task would be easier if our knowledge of the action of chemicals upon bacteria was more scientific. It is useless to beg the question by saying that the bacteria are poisoned. I confess a deep ignorance as to how a chemical like sublimate kills bacteria. It may, and probably does, enter into chemical combination with the micro-protein. But this cannot be the whole truth, because the quantity of the chemical varies according to the species of bacterium and not according to the quantity. Some species of micrococci are more quickly killed by a given quantity of sublimate than others, and even the age and vigour of the growth may make a difference. We begin to know something about the antiseptic and disinfectant properties of chemicals. Quite a romance might be written about the vicissitudes of some. The experiments of Koch placed sublimate upon the highest pedestal only to be laid low by the experiments of Geppert. Kanthack and Drysdale gave the palm to biniodide of mercury, and said it was twice as strong as sublimate. Andrewes,⁴ and Krönig and Paul⁵ throw doubt on this and exalt sublimate; but, as a matter of fact, a chemical which is the best in the laboratory is not necessarily the best in surgical practice.

The other day a friend showed me his hands covered with an angry rash. He had been trying a skin disinfectant on the recommendation of a bacteriologist. The disinfectant had, I believe, given wonderful results in the laboratory, but evidently it did not agree with that particular skin. Nevertheless another individual might have found it non-irritating; so much depends upon personal idiosyncrasy. Whilst working with a colleague who used sublimate my own hands were in a continual state of irritation and yet his seemed always to be smooth and comfortable. Now the biniodide of mercury which I habitually use never causes me discomfort and seldom roughens the skin of my hands. Others, owing to some peculiarity, may not have had such a fortunate experience. Again, a chemical which gives bad results in the laboratory may give good ones in surgical practice. Iodoform is one of these. It cannot be called a disinfectant and its antiseptic properties are exceedingly feeble; nevertheless it is of great value in the treatment of wounds about the rectum and for some forms of tuberculous ulceration.

The truth is that different kinds of infection have to be fought with different kinds of chemicals used in different ways. Experience has a great part to play in the choice, and doubtless we have all much to learn. Here are a few examples, selected because they illustrate some sources of infection which are sometimes overlooked.

The importance of using the right chemical disinfectant in the right way is, I think, well shown in the treatment of chronic sepsis of the bladder and urethra. These dangerous forms of sepsis are often overlooked and the strange symptoms they produce are attributed to wrong causes. For instance, an officer was affected with a series of abscesses in the subcutaneous tissues of the face, neck, buttocks, and thighs. The abscesses left discharging sinuses which did not heal. Although the tubercle bacillus was not seen or its presence demonstrated by inoculations the abscesses were attributed to tuberculosis. Whenever a patient has mysterious supuration the source of infection should be looked for though it may be very difficult to find. In this instance it was discovered by making the patient pass urine into a glass, when numerous flakes of lymph were seen. The bladder could not be disinfected until a stricture of the urethra, about which nothing had hitherto been said, had been divided. Recovery was rapid, complete, and permanent.

When bladder sepsis is overlooked its effects may be attributed to mere abstractions, such as "rheumatism." A gentleman who was supposed to have "gouty arthritis of the ankle" was speedily cured by disinfecting the infected bladder and urethra with nitrate of silver. A lady with "rheumatic arthritis of the knee" was cured and remarkably improved in health after a gynaecological colleague had curetted and disinfected the septic interior of the uterus. Some chemicals can hardly be used on conscious patients because they are so painful even in extreme dilution. This is especially noticeable when they are applied to some of the mucous membranes. For instance, a gentleman's bladder was being disinfected with a solution of nitrate of silver, the strength of which had been gradually increased until it had reached 1 gr. in 1 oz. of distilled water. This could be retained in the bladder for five minutes without much discomfort. One day no nitrate of silver was available, so 4 oz. of 1 in 10,000 solution of sublimate was introduced. The patient immediately complained of intense pain, and was obliged to eject the lotion as quickly as possible.

I have found solutions of hydrogen peroxide far more efficacious than mercurials in the treatment of those horribly fetid appendicular abscesses, and for similar ones about the middle ear. The effects of about three applications of a 5 per cent. solution of hydrogen peroxide were most striking in the case of an elderly lady. A large localized appendicular abscess was opened, with relief of pain and a diminution in the height of the temperature and in the rapidity of the pulse. Two days afterwards the abscess cavity became abominably fetid, with gangrene of the edges of the abdominal wound. The gangrene attacked the muscles more than the skin and fat. The patient became critically ill, with a rapid pulse and heightened temperature. The gangrene was arrested and the fetor removed by two or three applications of a 10 per cent. solution of hydrogen peroxide, and the patient got well. The usual mercurial disinfectant had been used, but without any result.

It is not without interest to note how iodoform has fallen from its high repute. Less than five years ago many of us thought a dusting of iodoform an indispensable part of the dressing of a wound. I myself have quite given iodoform up, and seldom use it except in the form of 10 per cent. iodoform gauze for septic wounds, such as those about the rectum, fetid appendicular abscesses, or those in connexion with middle-ear disease. In such cases as these it seems to be of value but in what way I know not. It is also useful in the treatment of tuberculous ulcers of the skin or mucous membranes.

It is sometimes asserted that the iodoform is decomposed in septic wounds and gives off free iodine, a powerful disinfectant. But I have tested mixtures of putrid pus and iodoform, and also septic wounds, with the delicate starch reaction without seeing a trace of blue discoloration, so that that explanation seems open to doubt. Perhaps iodoform does neutralize ptomaines, but we are still groping in the dark, and obviously must continue to do so until provided with scientific information. There are other reasons for relinquishing the use of iodoform. Some patients object strongly to its peculiar odour, others are very susceptible to its poisonous effects, and speedily begin to smell and taste

it. Occasionally iodoform causes acute local inflammation. A lady had several operations performed upon her face after a severe horse accident. A little finely-powdered iodoform was dusted upon the wound, and produced an acute dermatitis with abundant vesication. Had this occurred but once I might not have thought much about it, but it happened after a second operation, and not after others in which iodoform was omitted. It is only fair to say that iodoform has not infrequently been blamed for the effects of septic infection. Doubtless the layer of iodoform dusted upon a wound served a good purpose by excluding the air, but a layer of silver foil is more efficacious and perfectly harmless.

We all devote much time and attention to methods of operating, but I am inclined to think that all do not give the same thought to what may be called "the organization of operations." I should imagine that the organization of an operation bears the same relation to methods of operating as strategy in war bears to tactics. In an aseptic operation every detail must be perfect and all engaged in it consistent. Not least amongst the details should be included an exhaustive diagnosis and a complete knowledge of human anatomy and pathology. To get the very best results in hospital practice each surgeon ought to have his own wards, theatres, instruments, nurses, and assistants. It is most undesirable for septic cases to be introduced into the wards or theatres used for the aseptic, and separate septic wards and theatres ought to be provided. It is necessary to make provision so that septic cases arising in the wards can be removed. Obviously to carry out these requirements necessitates a much larger provision of isolation wards for septic cases as well as a theatre for septic operations. Moreover, the theatres at present used for aseptic operations often leave much to be desired, especially as regards the intrusion of the audience into the area of operation. The present organization, buildings, and equipment of our old hospitals cannot be made to meet such requirements as these; but I do not doubt that evolution will continue and that our ancient hospitals will be replaced by modern. Hospitals built on modern lines require for their construction a spacious area of land. Imagine for a moment a spacious ward containing twenty-five beds, all in view of the night nurse. Then project from one end the sanitary towers cut off by cross-ventilation, and perhaps a balcony too; at the other end put the sisters' room, kitchen, day room for convalescents, clinical room, four separation rooms, linen rooms, clothes room, and such like conveniences. Lastly, remember that in proximity must be operating theatres with anaesthetic rooms, recovery rooms, instrument rooms, and dressing rooms. What a space all these require, without mentioning the accommodation of the resident medical and surgical staff, or of the medical school, or of the sterilizing rooms, or machinery for heating and ventilating. A medical school is a great aid to efficiency and to that perfection of organization which aseptic surgery demands. Further, it is to be remarked that all this tends to the humane and considerate treatment of those who are so helpless from disease or injury. To my mind it is barbarous to compel those who are convalescent to sit about in wards surrounded by those who are undergoing the painful ordeals from which they themselves have just emerged, and to pass their time

'Mongst horrid shapes, and shrieks, and sights unholy!

Day rooms should be provided for them, and separate rooms for those who are maimed, and whose lives are ebbing away. As a profession we are far too callous about these things.

It is also probable that the system of assistants will require modification. It is of importance that the surgeon should be assisted by one who is a convinced aseptician, and who is thoroughly conversant with his methods. In nearly all our hospitals the house-surgeons and dressers are appointed for limited periods. Those gentlemen do their work remarkably well, and with great devotion, but unfortunately their period of office comes to an end just as they are beginning to be efficient.

Obviously our present system must increase the percentage of sepsis even among the cases of the most consistent aseptic surgeon; but the system is of great educational value, and it is difficult to say which is best—a system which sends out into the world numbers of men well educated in the requirements of aseptic surgery, or one which helps one surgeon to obtain a minimum percentage of suppuration. I myself have no doubt as to the right answer; the greatest good of the greatest number ought to prevail. I believe that

the inhabitants of the British Isles, even in remote parts, have at their disposal one of the best medical services that exists.

I have pointed out many details in which my own organization may be imperfect. The disinfection of the skin of the patient and of the operator's hands leaves much to be desired, and much of my work has to be done amidst surroundings which are out of date. But one who is alive to deficiencies is more likely to supply them than one who is wrapt in complacent optimism. I am an advocate for simplicity and uniformity in the organization of operations. It has been well and truly remarked by the celebrated Desault "that the simplicity of an operation is the measure of its perfection."⁶ In organizing the operation it would be hard to improve upon these words of Desault, quoted with approval by one of his peers. Now that we are so alive to the dangers of infection simplicity is more needed than ever before. The elimination of each unnecessary pair of hands lessens the dangers of infection. Therefore the surgeon alone handles the instruments, ligatures, sutures, and dressings. The single assistant has little to do and his fingers ought to be kept out of the wound. A garrulous assistant is particularly objectionable. A passage of infective particles from the nose and mouth ought to be a well-recognized danger. Simplicity should govern the choice of instruments and of materials. Instruments should be few and simple, materials uniform and simple. Thus it would be safer to use a single reel of silk throughout than several sizes, with perhaps some fishing gut or catgut and kangaroo tendon in addition. Obviously diversity of materials multiplies the chances of infection. The same applies to dressings. The chances of error must be less when one kind of dressing is chosen and adhered to. As our hospital organization is at present I find it difficult to adhere to one dressing and those who watched my practice might naturally suppose that I was extremely inconsistent.

REFERENCES.

- ¹ BRITISH MEDICAL JOURNAL, October 25th, 1890; May 28th, 1892; January 27th, 1894; July 11th, 1896; September 17th, 1898; February 24th, 1900. ² Correspondence in BRITISH MEDICAL JOURNAL, August 6th, 1902; *Lancet* February, March, May, and June, 1903; also Watson Cheyne, *Aseptic and Antiseptic Surgery*, *Lancet*, February 7th, 1903, p. 347. ³ Doederlein, *Munch. med. Woch.* (Abst. BRITISH MEDICAL JOURNAL, June 27th, 1899). ⁴ *Lessons in Disinfection and Sterilization*, by F. W. Andrewes, London, 1903, p. 91. ⁵ Die chemischen Grundlagen der Lehre von der Giftwirkung und Desinfection, *Zeits. f. Hyg. u. Infectiouskrankh.*, Leipzig, 1897, pp. 1-112. ⁶ Robert Liston, *Practical Surgery*, 3rd edition, London, 1843, p. 1.

SOME PRACTICAL POINTS ASSOCIATED WITH APPENDICITIS.

By W. D. SPANTON, F.R.C.S. Eng.,
Consulting Surgeon, North Staffordshire Infirmary.

QUITE recently it has fallen to my lot to see several cases of appendicitis which present tempting material for a few remarks, for almost every case, and certainly every group of cases, presents some features of interest and value.

Somewhere about twenty-five years ago I excised the appendix, long before it had become a fashionable procedure. No doubt, like many other affections, appendicitis had been long known and recorded, but its full clinical significance was not appreciated until more recently; now, as one comic paper cynically observes, those are most subject to it who can afford to pay for an operation. There may be some truth in this, although it is by no means the rule.

The early symptoms are often not only obscure but positively misleading, and the typical signs the books describe so mathematically are often represented by a cipher. Statistics on the subject have been denounced by one surgeon as belonging to the third category of lies, so I will refrain from alluding to them. The remarks I have to make are based entirely on my own observation and experience, which date back to a period long before McBurney's point was ever heard of.

CASE I.

The first case of nine quite recent ones was a young gentleman, aged about 22, whom I was asked to see by Dr. Leapingwell. When I saw him he looked very ill. There was distinct tension and fullness over the right intra-iliac region; he did not complain of pain, and only slight tenderness over the swelling. The temperature, which had been nearly 108° F. at 4 a.m., was at 8.30 a.m. about 104°. His pulse had become firmer, about 120. As he had rallied from the collapse of early morning I at once operated by lateral incision, and found considerable matting of the omentum round the caecum, the appendix gangrenous, lying in a circumscribed cavity containing some reddish, thin, foul pus. I removed the appendix very close, and noticed sloughy patches on the