FURTHER REMARKS BY PROFESSOR EWALD.

PROFESSOR EWALD made a few remarks with especial reference to Professor Saundby's statements. He quite agreed with the efficacy of rest and bed treatment as recommended by Professor Saundby. But he went a step further, and believed that for many stomach diseases, especially those of nervous origin, the best way to treat them was to send them to a suitable sanatorium and take them away from home. As Professor Saundby pointed to the difficulty of making a differential diagnosis between pains of neurotic origin and those caused by ulcers, in his opinion there were two symptoms which differentiated between them: First, hyperchlorhydria, which was present in most cases of ulcer and failed in most of the cases of neurotic pain in the stomach. Secondly, the disappearance of the pain caused by an ulcer after the patient had been exclusively nourished for some days *per rectum*. Neurotic pains, on the other hand, soon disappeared or only persisted for a short time.

THE VALUE OF BACTERIOLOGICAL EXAMINATION BEFORE, DURING, AND AFTER SURGICAL OPERATIONS.*

By W. S. MELSOME, M.A., M.D., B.C. CANTAB.,
F.R.C.S. ENG.,

Assistant Surgeon to the Royal United Hospital, Bath.

WHEN we consider the valuable information which may be gained by a search for micro-organisms by the aid of the microscope, it is somewhat surprising that it is so little used for this purpose by surgeons in hospitals and in private practice. I am not urging that it is necessary for the surgeon to discriminate between different kinds of micro-organisms, but I wish to point out the advantage he derives from being able to decide whether or not micro-organisms are present in the structures with which he is about to deal. The answering of this question by coverslip preparations is a very simple matter, requiring no special knowledge and very little time. If by these means we may obtain information of such value as, at one time, to leave no doubt in our minds as to the necessity of immediate operation, and, at another time, the absolute necessity of postponing it, surely we cannot ignore it.

I do not hesitate to say that operations undertaken without any attempt to obtain this easily accessible information beforehand have resulted in the loss of many lives; yet, go where you will, into metropolitan or provincial hospitals, how rarely will you see it made use of by surgeons for this purpose—still more rarely will you see it used in private surgical practice. The object of this short paper is to demonstrate as far as I can the value of the microscope to the surgeon—before, during, and after operation.

THE VALUE OF MICROSCOPIC EXAMINATIONS BEFORE OPERATIONS.

CASE I.—A woman was admitted into a hospital with severe bladder trouble. She made water frequently by night and day, and during its passage and for a short time afterwards she suffered severe pain. The resident medical officer centrifuged the urine, made coverglass preparations, stained by Gram and other methods, and satisfied himself that she had gonorrhoea. A few days after admission she complained of pain and swelling in the right knee. The swelling was due chiefly to fluid in the joint. On the following day some of the fluid was drawn off and sown on Loeffler's serum, ordinary serum, agar agar, and other media; and also examined immediately with the microscope. The tubes remained sterile and the microscope showed complete absence of micro-organisms. It was decided, therefore, that there was no necessity to open the joint. The day following the examination, however, the condition of the joint was still worse. Two experienced surgeons were invited to give their opinion, and they, without hesitation, said: "The joint must be opened at once, or she will be obliged to have her leg off." The microscopical evidence and sterile tubes had no weight whatever with them. More opinions were invited, and altogether ten surgeons and physicians viewed that joint, amongst whom the resident medical officer found two supporters. The joint was not opened and the knee got perfectly well.

CASE II.—A boy was admitted into a hospital two days after receiving a punctured wound near the knee-joint. The wound was foul, and the joint distended with fluid. It was doubtful whether the wound actually communicated with the joint or whether the effusion in the latter was due to irritation of the synovial membrane, caused by diffusion of organisms or their products from the wound. The house-surgeon was ordered to aspirate the joint to ascertain whether it contained pus, and if so, to

freely open and drain it. The fluid obtained was opalescent and full of cells. So far, there was no indication for or against opening the joint. Joints containing opalescent fluid full of cells often get well if left alone; joints, however, containing opalescent fluid full of cells and micro-organisms, if left alone, may give rise to very serious consequences. Yet it never occurred to anyone present to stain a coverslip preparation and examine for cocci, though this would have given the necessary information in a few minutes.

CASE III.—An elderly woman was admitted with a foul-smelling blood-stained discharge from the uterus. A microscopical examination revealed an abundance of streptococci, which, growing under such conditions, were likely to possess a high degree of virulence. The house-surgeon was requested to dilate the cervix with tents, in order that the body of the uterus might be examined next day. Two sea-tangle tents were introduced at 11 P.M. and removed in the morning. The intrauterine examination took place at 3 P.M., and at 11 P.M. the temperature was 102°, and ranged between 102° and 104° till death on the fifth day. On the fourth day some blood was drawn from one of the veins of the forearm, and sown on serum, agar-agar, etc. All the tubes showed colonies of streptococci. At the post-mortem examination streptococci were found in the blood of the heart and in all the metastatic abscesses which were examined.

Again, in dealing with the urinary organs, a search for micro-organisms repays us perhaps as much as in any branch of surgery. It is well known that the so-called urinary or catheter fever is due to micro-organisms which invade the tissues from unhealthy urine. The importance, therefore, of examining for micro-organisms before any operative procedure on the urethra or bladder should be more generally recognised than it is. In this way information would be gained which might lead one to defer an operation, or, if an immediate operation were necessary, to adopt such procedures as would minimise its risks.

We must not imagine that because the urine is acid, contains no albumen and has no offensive smell, it is therefore free from micro-organisms. I know of several persons whose urine is crowded with them, and yet it is acid and contains no albumen; moreover, these persons suffer no inconvenience except at certain seasons of the year, when the water has a somewhat unpleasant smell. That such micro-organisms may be a source of danger to those about to undergo an operation in the neighbourhood of the urinary organs, the following case would seem to indicate:

CASE IV.—A man was admitted into a hospital to be operated on for varicocele. I happened to be present when one of the house-surgeons was examining his urine. The man made no complaint about his water, and the house-surgeon contented himself with the usual chemical tests for albumen and sugar, both of which were absent. We noticed, however, that it had a peculiar smell, and I said I would take away a specimen and examine it with the microscope at my leisure. This I did in the evening, after the operation was over. It was full of micro-organisms, chiefly streptococci. The next day other specimens were examined with the same result. The dressings became accidentally contaminated with the urine, erysipelas developed in the wound, and in a few days the man was dead.

THE VALUE OF MICROSCOPIC EXAMINATION DURING OPERATIONS.

I may state at once that although the information is interesting from a pathological point of view, it is not of the same practical importance as information obtained by examination before or after operations.

To-day the tendency is to remove chronic abscesses which we imagine to be the product of the tubercle bacillus by dissection, and, when this is impossible, to evacuate the contents, to remove as much as possible of the limiting membrane, and completely suture the skin wound with the view of obtaining primary union, and of minimising the risk of a mixed infection.

This attempt at primary union is often unsuccessful, and I think that the failures are mostly due to the fact that we have not yet learnt to discriminate between different kinds of chronic abscesses. We are too apt to think that because an abscess is chronic it is therefore necessarily tuberculous. If this were true, the failures I have just mentioned would not be so frequent.

If the contents of a number of chronic abscesses, which clinically are considered to be tuberculous, be examined microscopically, it will be found that many contain the ordinary organisms of suppuration.

Perhaps I go a little too far in saying that surgeons consider such abscesses to be tuberculous, but I have often seen them open chronic abscesses connected with glands in the neck, scrape the limiting membrane and completely unite the skin, which to my mind is a passive admission that they at the time considered them to be tuberculous, and I have frequently examined the pus from these abscesses at the time of opera-

* Read before the Bath and Bristol Branch of the British Medical Association.

tion, and having found pus cocci present, have been able to predict that suppuration would continue, and that some of the stitches would shortly have to be removed, and this is what usually followed.

Abscesses then, which are viewed clinically as "chronic," are not always free from the presence of ordinary pyococci. If the pathology of inflammation be considered for a moment, it will be seen that there is nothing surprising in this statement. If healthy tissues are subjected to chronic irritation of whatever kind, they come to be in a state of chronic inflammation, and when they have been thus inflamed for some days they offer greater resistance to microbic invasion. If we inoculate these tissues with certain kinds of living organisms the results are less severe than those produced by similar inoculations into the sound tissues of the same body. This I think is the reason why pus cocci are so apt to give rise to chronic instead of to acute abscesses in the glands of the neck in children. These glands, being so frequently irritated by septic products from the tonsils, scalp, ears, etc., are rendered more resistant than usual.

In 1894 (*Journal of Bacteriology and Pathology*) Mr. Cobbett and I showed that the peritoneum after recovering from an inflammatory attack offers greater resistance to subsequent infection than the normal peritoneum, and clinical experience, as Mr. Treves¹ has pointed out, teaches us that it may, in these circumstances, be operated on with greater safety than if it had not been previously inflamed.

The capacity of the tissue then to resist microbic invasion is probably an important factor in determining the kind of abscess which will result. Again, if the whole body be partially immunised against a particular organism towards which it is susceptible, the result of inoculation of these organisms is greatly modified; for example, if a horse be partially immunised against diphtheria, subcutaneous inoculations of living diphtheria bacilli will produce a cold abscess, from which a pure cultivation of these bacilli may be obtained several days afterwards. This fact was pointed out to me some years ago in Cambridge by Mr. Cobbett.

Again, in pneumonia, when due to pneumococci, an empyema containing living pneumococci unmixed with other organisms may exist for a considerable time, and produce remarkably little disturbance. This again is at a time when a marked general immunity has become established against this micro-organism. Now, these facts which have been proved to be true for the above organisms could probably be shown to be true of others.

Thus, then, in certain circumstances it is possible to meet with chronic abscesses due to organisms other than the tubercle bacillus, but it is often impossible to distinguish them without the microscope. If on microscopical examination no organisms are found in the pus, it is justifiable to scrape the limiting membrane and unite the skin wound. If, however, pus cocci are found, both of these procedures will be unscientific, but as I have already stated, it is not of much practical importance; suppuration will continue, and stitches will require to be removed, but grave consequences will rarely ensue.

The sac of a strangulated femoral hernia sometimes contains a blood-stained fluid, in which the microscope often reveals the presence of the bacterium coli commune. This is a sign that the wall of the strangulated piece of intestine has to a great extent lost its vitality. In these circumstances the sac should be carefully cleansed and dried before the abdomen is opened to prevent inoculation of that cavity; the abdominal viscera in the neighbourhood should be disturbed as little as possible in the process of reduction, and the strangulated piece of intestine left just within the ring, supported by a gauze plug, which also serves for a drain.

Perhaps we may conclude that although the microscope in the operating theatre may not be a matter of life and death, it may at times be valuable in cases in which doubt arises as to what line of treatment should be adopted.

VALUE OF THE MICROSCOPE AFTER OPERATIONS.

A few weeks ago a man was brought to our hospital with three extensive wounds in the left upper limb, each involving the elbow joint. There was a compound comminuted fracture of the lower end of the humerus, the bone being split through the external condyle into the joint. The superficial flexor

group of muscles of the forearm was completely severed and protruding from the wound. Arrangements were made to obtain primary union. Twenty-four hours later the temperature was 102° F. and the pulse 120. Now in circumstances such as these, it is of no use speculating as to the incubation period of streptococci, or the highest temperature and pulse-rate consistent with the mere absorption of disintegrated blood products, or again, the lowest temperature and pulse-rate consistent with sepsis. What we really want to know is, whether micro-organisms are or are not multiplying in the wounds; and in order to answer this question I passed a sterilised probe into the deeper parts of each one of them after carefully sterilising the skin along the lines of suture. I then made coverglass preparations, and examined with the microscope. No organisms were discovered. On the following day, the temperature being 101.5°, another examination was made, and again on the fifth day—each time with a negative result. The temperature remained about the same till the seventh day. The wounds, however, healed well, and the man could move his elbow-joint from start to finish.

The use of the microscope in such cases is obvious, for if the wounds become septic, you will discover the fact earlier by this than by any other means; and you are able at the earliest possible moment to open up all the wounds, and resort to continuous irrigation, or to any other line of treatment which may be thought advisable to avert a catastrophe. On the other hand, negative results allay anxiety, and prevent restless nights.

I am aware that micrococci have frequently been found by cultivation methods in many wounds which run an aseptic course, but I believe that in these circumstances they are not sufficiently numerous to be readily detected by direct microscopical examination; and I know, from a considerable number of personal observations, that within twenty-four hours after an operation they may readily be detected by this method in wounds which become septic; and if I had found a considerable number of cocci in the case I have just mentioned, I think I should have been justified in opening up the wound and taking such steps as would be calculated to check further infection.

With regard to after-examination of this kind, we may say, *Ex uno, disce omnes*; and I will not, therefore, burden you with any more.

REFERENCES.

- ¹ BRITISH MEDICAL JOURNAL, 1893, p. 632.

TWO CASES OF INTESTINAL OBSTRUCTION: LAPAROTOMY: RECOVERY.*

By W. M. BARCLAY, F.R.C.S.,
Surgeon to the Bristol General Hospital.

CASES of successful laparotomy for intestinal obstruction are unhappily not so numerous as to be commonplaces of surgical practice, and I venture to think that the two cases I am going briefly to relate have other points of interest besides their successful issue.

CASE I.—A man, aged 61, was admitted under my care at the Bristol General Hospital on November 15th, 1896. Four days previously, after a heartier supper than usual, he went to bed and awoke in a few hours with pain across the abdomen. The pain increased through the night, and the next morning he was sick. Dr. Perry was called in, and attended him till his admission into the hospital, and kindly furnished me with the details of his illness. The sickness persisted, and was bilious in appearance till the day of admission; the bowels, which had acted as usual on the morning of the seizure, were not moved afterwards, nor was flatus passed. A dose of castor oil on the fourth day produced no effect. On the afternoon of the 15th—the fifth day—the vomit was like dark liquid feces, and Dr. Perry had him removed to the hospital at once. When I saw him at night he was placid and free from pain, and had nothing of the drawn and anxious appearance of many cases of acute obstruction; the tongue was clean and moist, and the pulse 90, regular, and of good force. The abdomen was considerably distended, but, though large coils were visible, especially at the sides, they exhibited the slightest, if any, peristaltic movement. Palpation could be expected to reveal nothing under such circumstances. The rectum was empty. The patient's history was excellent; he had been accustomed to have a daily action of the bowels, and he had had no illness that he could remember. The only thing amiss before the actual seizure was a little gripping pain for a few days. Laparotomy was performed at once. A small median incision was made, and opposite to it the finger came upon a hard mass about as large as a bean; it lay deeply against the spine, and could

* Read at a meeting of the Bath and Bristol Branch of the British Medical Association.