letting these remain on for some days, or till they drop away of themselves, does not commend itself to me as good surgery; neither do I care to use the cautery. The chief risk of this operation arises probably from hæmorrhage, and death from hæmorrhage is not infrequent when the cautery is used. The reason of this is that the action of the cautery must be incomplete, there being no room to apply pressure behind the cauterised parts. The simple way to do this operation is to do it with scissors, to go as wide of the disease as the bladder or ureters will permit, to stop all bleeding and oozing, and to close the wound carefully, uniting peritoneum and all the structures. Some are cured, or die years after of other diseases; and when death does come from a return of the disease, it comes in a milder and less terrible form, generally from some intraperitoneal affection. The misery of the spreading of the disease on to the vagina and outwards, and opening into the bladder and rectum, is generally saved to the patient and her friends.

It need not be added that discrimination in selecting cases for operation is absolutely necessary. Unfortunately, the number who are alarmed in the curable stage is few, for the symptoms of the beginning of cancer of the uterus are unknown to, and are thus overlooked by, the patient. Her attention is rarely drawn to symptoms before the disease is past surgical interference. Operated on at an early stage, uterine disease will show results not much inferior to operations for cancer in other parts of the body.

EXTRACTS FROM AN ADDRESS ON THE PRESENT POSITION OF ANTISEPTIC SURGERY.¹

*Read in the post-graduate course of the University of Toronto,
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For several years it has been my custom in my lectures at the University of Pennsylvania to pass rapidly over the evidence in support of the antiseptic theory of wound treatment, with the remark that the time for argument had passed, and that it was merely necessary now to present such facts as might serve to make clear the principles involved and to emphasise the enormous benefit that has resulted from the application of those principles to practical surgery.

I also thought that the whole history of the development and establishment of this great theory, while including the admirable labours of hundreds of medical men in all parts of the world, and constituting one of the brightest chapters in the record of human progress, yet centred around the figure of the English-speaking surgeon, whose name was identified with it from its incipency, in whose mind the grand conception first took practical and definite shape, and whose patient, unassuming, conscientious work in elevating his original thought into a working hypothesis and in transforming the latter into a theory of worldwide acceptance, seemed to me to present perhaps the best, and certainly the most important, example of the application of purely scientific methods to practical surgery to be found in the history of the profession.

When, however, a noted surgeon, a successful operator, and a vigorous controversialist undertakes to traverse the whole line of thought and argument upon which my confident acceptance of the theory was founded, denies its basal facts, ridicules its logic, jeers at its methods, challenges its records, and attacks its author and his supporters, it seems to me proper that those of us who are teachers should once more review the evidence, consider the situation, and, according to our conclusions, publicly reaffirm or renounce our faith in the theory and practice of antiseptics.

The antiseptic treatment of wounds might, under Mr. Tait's ruling, be described as a treatment directed against

the causes of putrefaction in wounds; but a more accurate definition expands it, as Mr. Cheyne has suggested, so as to include treatment directed against the cause, not merely of the putrefactive fermentation, but of all fermentations.

The sterility of the blood and tissues is denied by Mr. Tait, who says "the germs exist already in the blood and elsewhere, and are ever present, according to the best authorities." The elaborate and carefully conducted experiments of Hauser,² Watson Cheyne,³ and others completely contradict this statement, which is really the foundation of Mr. Tait's argument. The germ theory of fermentation is undisputed. Fermentation in wounds can, therefore, be prevented by the exclusion of germs; it has been shown microscopically that these can be kept out (asepsis) or can be destroyed (antiseptics); practically, therefore, it only remains to show the effect upon patients with operative or other wounds of excluding or destroying germs to show the value or lack of value of antiseptics and the antiseptic theory. By looking back a few years to the very beginning of the employment of antiseptics we can obtain the most striking and convincing evidence of the effect of treatment directed almost exclusively, though then very imperfectly, against the introduction of bacteria.

The record of the work of Professor Lister may well begin our series of examples. In Glasgow, in 1864, 1865, and 1866, Mr. Lister's mortality in a series of operations of all sorts was 45.7 per cent., largely from septic diseases. About this time he began to employ gradually some antiseptic methods in his treatment of wounds and during operations. In 1867, 1868, and 1869, his mortality fell to 15 per cent. At Edinburgh, having greatly improved the details of his system, we find that from 1871 to 1887 he treated 553 grave surgical cases with a mortality from septic disease of only 0.36 per cent., a diminution in the death-rate which, when we remember that these different results were obtained by the same man operating upon the same class of patients and for the same injuries or diseases, is so striking as to be in itself conclusive. Still later, an opportunity was afforded to compare Mr. Lister's results with those of a colleague, Mr. Spence, working in the same hospital, but declining to employ antiseptic methods. The total results of their major operations showed that Mr. Spence lost just about three patients where Mr. Lister lost one, while the deaths from infective diseases were 2.4 per cent. among Spence's cases, and one-third of 1 per cent. or eight times less among those of Mr. Lister. When we turn to the work of other surgeons, we find evidence, if possible, still more conclusive of the value of these methods. Nussbaum has shown that during forty years in the clinic under his own direction as well as that of his predecessors, among whom was Stromeyer, the deaths from wound diseases were so common that patients with even the slightest injuries often succumbed to them; that erysipelas and abscesses were matters of daily occurrence; that 80 per cent. of all wounds and sores were attacked with hospital gangrene, and that nearly all patients with compound fractures died; and he states that immediately upon the introduction of the antiseptic system, all these diseases vanished; and healing by first intention, previously almost unheard of in his service, became the rule instead of the exception. Professor Volkmann, in an address before the International Medical Congress which met in London in 1881, testified strongly and clearly to the results obtained in his own practice, selecting two subjects especially, compound fractures and major amputations, as evidence of the value in his hands of the antiseptic method. He said that the mortality after compound fracture had, during the long labours of the surgeons who preceded him as well as during his own, reached the sad height of 40 per cent. Immediately before he adopted the antiseptic method of treating wounds, his last twelve patients with compound fracture had all died of pyæmia or septicæmia. From that time up to the period at which he delivered this address he had treated 135 compound fractures without losing a single patient from either of these wound diseases; 133 were cured; 2 died, one of fatty embolism of the lungs during the first few hours, and one, a drunkard, of delirium tremens. As to the amputations, he asserted that he now cured each year by the antiseptic method more cases of amputation of the thigh, for example,

¹ A reply to Mr. Tait's recent criticism of Sir Joseph Lister's Berlin Address. The full text, with tables, will be published in the forthcoming number of the *Annals of Surgery*.

² *Archiv f. experiment. Pathologie und Pharmacol.*, Bd. xx, p. 182.

³ *BRITISH MEDICAL JOURNAL*, March 3rd and 10th, 1888.

than during all the rest of his labours before the introduction of the method. In an article on the treatment of compound fractures, Professor Dennis, of New York, has compiled further evidence in this same direction. In the Pennsylvania Hospital, between the years 1839 and 1851, there were treated 116 cases of compound fracture of the leg and thigh; excluding those cases requiring amputation, there were 51 deaths, a mortality of 45 per cent. In the New York Hospital, during the same period, there were treated 126 cases of compound fracture of the leg and thigh; excluding amputations, there were 61 deaths, a mortality of 48 per cent. From 1860 to 1876 there were reported from the surgical clinics of Vienna and Zürich by Billroth 180 cases of compound fractures; excluding amputations, there was a mortality of 41 per cent. from septic disease. In the Obuchow Hospital Reports of St. Petersburg, 106 cases of compound fracture gave a mortality of 68 per cent. In Guy's Hospital, from 1841 to 1861, there were reported 208 cases of compound fracture, with 50 deaths, a mortality of 26 per cent. After the introduction of antiseptics, this death-rate immediately fell to 4 per cent. from an average of 40 to 50 per cent.; and in this article of Dr. Dennis, in which he reports 516 cases of compound fractures, there was no record of death from septic trouble in any fracture of the extremities, which was the class of injuries included in the above statements.

Mr. Tait endeavours to break the chain of reasoning by saying: 1, that the germs are everywhere and cannot be got rid of—a misstatement—and 2, that the presence or absence of sepsis depends on the presence or absence of “pabulum,” that is, dead organic matter, blood clot, serum, etc. It has been one of the axioms of antiseptic surgery from the beginning that scrupulous attention should be paid to hæmorrhage and to drainage. No one has taught this more earnestly than Lister and his followers, and Tait's adoption of it as his “view” is evidence of his ignorance of the work of others. To be sure he says that Keberlé first taught him drainage in 1875, and gives due and deserved credit to Chassaignac for his work in this direction, but English and American surgeons have employed drainage fully and carefully since the early part of this century, and Syme in 1826 made the importance of providing a free escape for the discharges from wounds the subject of one of his most important papers. It is easy to say that if you have nothing to decompose there will be no decomposition, for that is what it amounts to. “Get out all decomposable matter,” he says, “and you can let the germs in freely,” but in practical surgery this is by no means always possible. Mr. Tait deals habitually with a membrane, the peritoneum, which has a remarkable power of self-protection. Microbes gaining access to the abdominal cavity are exposed to destruction either by the serum which it copiously exudes, or by a possible phagocytic action of its enormous numbers of endothelial cells, or by both.

Mr. Tait's remarks against dosage are further evidences of his want of acquaintance with Listerian work and teachings. He says: “With the Listerians one germ is as good as a thousand.” I suppose it is safe to class Mr. Watson Cheyne, whom I have just quoted, as a “Listerian.” In Mr. Cheyne's lectures on “Suppuration and Septic Diseases”⁴ he not only asserted, but proved experimentally, that the number of bacteria introduced modified greatly the intensity of the symptoms and even the character of the disease. Similar observations have been made by Passet,⁵ Pawlowsky,⁶ and others, and are as well known as any in connection with antiseptic surgery.

It is evident that what is original in Mr. Tait's “hypothesis” is not true, and that what is true in it is not original.

The Prevailing Antiseptic Methods.—It seems apparent, at any rate, that Mr. Tait is not a safe or reliable authority on the general subject of surgical antiseptics, but towards the end of his paper he ventures on a specific fling at Lister's last surgical dressing. The most obvious advantages of the double or mixed cyanide of mercury and zinc are—first, that it is non-volatile; next, that it almost entirely unirritating; thirdly, that it is insoluble in water and only soluble in 3,000 parts of blood serum; and, finally, that, while it possesses but little germicidal value, its inhibiting power is so high

that a 1 in 1,200 solution is sufficient to keep animal fluids permanently free from putrefaction. This combination of qualities is possessed by no other of the antiseptics which have been mentioned, and its deficiency in germicidal power is easily remedied by including in the manufacture of the gauze dressings which are impregnated with this material a small percentage (1 in 4,000) of sublimate, enough to be germicidal, but too weak to be markedly irritating.

[Dr. White showed a table of 195 cases treated since beginning the use of cyanide gauze, that is, from September, 1889, to December, 1890.] Of the five deaths in this list, two were due to pre-existent and chronic disease; the other three were abdominal cases, operated on with the patients almost *in extremis*, with swollen bellies, intestinal paresis, and in one case with suppurative peritonitis. In the whole list there have not been six freely suppurating cases, and there have been no cases of septic trouble and no deaths from any form of blood poisoning. The majority of these cases have been observed from beginning to end by sections of the University class, and have been under the daily care of my residents at the University Hospital. Upon others I have operated in private.

I am glad to be able to give this positive testimony in favour of the latest Listerian method, which, while it may not be permanent (as there are yet many opportunities for improvement before the ideal dressing is reached), is obviously undeserving the epithets of “deadly and dangerous,” applied to it by Mr. Tait, without, I will venture to say, his having taken the trouble to watch its effect in a single instance, to calculate the quantity of cyanide in a single dressing, to consider the improbability of absorption, or indeed to give the matter any serious consideration whatever.

It cannot be disputed that in the light of modern science the operator has a twofold duty, namely, to prevent the entrance of living pathogenic microbes into the wound, and at the same time to preserve the vitality of the tissues themselves. We have abundant reason to believe in a general antagonism between the body cells and the micro-organisms of disease, and it follows that the theoretical propriety of non-interference with these tissues cannot be doubted, and Lister plainly admitted and accepted this new view when he said that the floating particles of the air having been shown to be less harmful than was supposed, we may possibly dispense with antiseptic washing and irrigation, “provided always that we can trust ourselves and our assistants to avoid the introduction into the wound of septic defilement from other than atmospheric sources.”

When this method is adopted it is evident that all strong antiseptic solutions which might compromise the vitality of the tissues must be discarded; instruments, silk, ligatures, sponges, etc., must be sterilised by heat, hands must be washed clean in sterilised water (after previous chemical disinfection), and the same is true of the skin over the field of operation. If antiseptic solutions are used at all they must be very feeble—1 to 60 carbolic for instruments (after previous sterilisation by heat), 1 to 10,000 sublimate for sponges, etc.

In the meantime, however, while waiting for further improvement in this direction, I have felt and still feel that it is safer in a large general clinic to depend upon full antiseptics rather than upon asepsis.

NOTES ON THE APPEARANCE OF CERTAIN SPOROZOÏD BODIES IN THE PROTOPLASM OF AN “ORIENTAL SORE.”

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THE appearance of Dr. Russell's interesting article upon the results of his investigations into the nature of what he considers to be a characteristic organism of cancer prompts me to call attention to the fact that very similar bodies have been discovered in the peculiar ulcer known as “Oriental sore,” “Delhi boil,” or “Multan sore,” etc. In an early issue of the *Scientific Memoirs of Medical Officers of the Army of India*, published at Calcutta in 1885, I think, there appeared a very clear and able article on the presence of peculiar para-

⁴ BRITISH MEDICAL JOURNAL, March, 1888.

⁵ *Monatshfte f. prakt. Dermatol.*, B. vi, No. 10, 1887.

⁶ *Centralblatt f. Chirurgie*, No. 48, 1887.