

understanding that it is our duty to destroy and exclude them from the body with all the care we possibly can; and if the means adopted for that purpose—call them Listerism, antisepticism, surgical cleanliness, or by whatever name we will—turn the scale a feather weight in favour of restoration to health or saving the life of a single human being, the man who refuses to employ them through prejudices or apathy incurs a responsibility nothing short of criminal. The difficulty which is now exercising the minds of practical pathologists and chemists is to find the most suitable germicide—one which will act efficiently without being poisonous to the tissues or the system at large; and it was interesting to watch how one after another they have been lauded and proclaimed, only to be superseded by another and another; and here at all events we are very far removed from finality. Carbolic acid, corrosive sublimate, iodoform, thymol, have each for a time enjoyed the crown for a few months, only in their turn to be deposed and dismissed as impostors with ignominy.

There is, however, another side of antisepticism which has been almost entirely neglected. It would appear as if, up to the present, attention had been exclusively fixed on infective germs, sufficient regard not being had to the important influence of environment. Every effort has been strained to discover the most infective and deadly germicide, when we know that these atoms, no matter how virulent they may be, cannot undergo their life changes, cannot produce these infective results, unless the environment, like the cultivation liquids of the histo-pathologist, was capable of developing and sustaining these changes. Deposited on clean metal, glass, or porcelain, they died of inanition; they exercised no influence whatever, and were amenable to none. In contact with dead organic matter, or living matter in certain conditions of altered or reduced vitality, they become a teeming source of infection, decomposition, and decay. If pathological surfaces could possibly be brought to and maintained in such a condition that they would not afford a suitable cultivation ground, would not almost as much be accomplished as when they are destroyed? He need hardly, Dr. Hamilton interpolated, quote examples of this influence of environment, such as the protection afforded by vaccination against the germ of small-pox, and the protection of the blood by previous action of exanthemata. The bacilli of splenic fever, so destructive to the herbivorous animals, take little effect on carnivora, and none at all on the pachydermata. The bacteria which will cause septicæmia in the mouse are wholly inert against the field mouse. We could learn much that would enlarge our views if we studied human by comparative pathology, and our researches must not be confined within the narrow limits of even the animal kingdom. Much can be learned by the pathology of the vegetable kingdom. Some of the most troublesome diseases which the surgeon has to deal with are derived from the invasion of vegetable parasites.

In connexion with the influence of environment, Dr. Hamilton related a remarkable fact which had been communicated to him by a friend who devoted much time and patient industry to the cultivation of fruit, and which he thought explained many facts in human pathology. In exhibiting fruit for prize competition, they have to be brought to a certain degree of ripeness to a day, almost to an hour, and the ripening can be hastened with almost mathematical precision by interposing between the prize specimens fruit of the same species which were already ripe, as if the emanation from the ripe fruit produced a ripening impression upon the apples in its immediate vicinity. He thought we saw this principle of environment frequently illustrated in human pathology when disease extends to adjacent but not continuous surfaces. This twofold aspect of infective inflammation was forced on his attention when trying to think out the best mode of dealing with chronic abscess—a subject which has for a long time taxed the ingenuity of the surgeon, and often defeated his most ingenious plans, no matter how carefully they may have been carried out. This might be gathered from the long list of methods paraded in our systematic works on surgery. There was nothing which indicated the uncertainty of our knowledge so much as the multiplication of modes of treatment; witness the hundred-and-one ways in which it is proposed to deal with so simple an accident as a broken collar-bone or a fractured femur. The structure of the immediate wall of a chronic abscess has been the subject of much diversity of opinion, and there is considerable doubt as to the existence of any such structures as the so-

called pyogenic membrane or cyst wall. The idea of Billroth, that an abscess is but a hollow ulcer, conveys probably an accurate description of its structure. Its action as an absorbent surface is frequently brought under our notice, but its power of pyogenesis is not in accord with modern pathology. There was a fact of very great interest in this connexion. The discharge from a recently opened chronic abscess does not contain the microzymes which are so characteristic of purulent matter in acute suppuration. Ogston and others have failed to detect them by the most carefully conducted observations, or to produce septic results by them; and hence it is that the collections produce little or no constitutional disturbance until they are opened. They may remain for years without any effect other than mere local inconvenience until the matter is discharged—either by the efforts of nature, or by the knife of the surgeon,—and the repeated observation of this fact has induced the surgeon to postpone any interference, waiting often too long for the slow process of natural opening. The clinical records of these cases would lead us to believe that in some remarkable way the system would appear to be somehow prepared for this event; and he was satisfied in his own mind that far less constitutional disturbance follows the natural opening than that effected by the surgeon. There could be no doubt the use of antiseptics has done much to reduce this difference, but he could not say, as the result of his own experience, that they had completely removed it.

Dr. Hamilton then briefly reviewed his plan of treatment of chronic abscesses, and, condemning the Vivisection Act, concluded by appealing to his hearers to make the best use of the means at their disposal and to carry forward the standard of investigation into new and unexplored fields. There was, he said, ample room and verge enough for work—many untrodden fields of discovery—so that they could make the future of Queen Victoria's reign as glorious in the annals of scientific discovery, as full of help to the sick and wounded sufferer, as had been its past.

NOTE ON THE USE OF DRAINAGE TUBES.

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IN THE LANCET a few weeks ago (vol. i. 1887, p. 947) was a very interesting note on the "Value of the Hæmorrhage in the Treatment of Wounds," wherein was set forth the opinion of Professor Turazza that hæmorrhage, provided that it be not due to the lesion of large vessels or carried to excess, is of small importance, and does not interfere with primary union. And as the outcome of his experience, the following "new rule" in surgery was formulated: that "in wounds perfectly disinfected, and free from foreign substances, the effusion of blood is not a source of danger, but the reverse, for the extravasated blood fills up the cavity of the wound perfectly, preventing the formation of empty spaces, and rendering both compression and drainage superfluous, and further, the organisation of the clot favours healing." Holding these views, the note tells us (for I have not seen his original paper) that he almost entirely discards the drainage tube, "because it increases septic risks, and may remove from the cavity into which it is inserted fluids which in an aseptic condition may be useful by reabsorption."

It would be instructive to know what is nowadays the general practice of surgeons with reference to the point of procedure here recorded. That the amplest possible drainage is ever necessary in cases of suppurating wounds, or of wounds which cannot from various circumstances heal by first intention, is, of course, an accepted doctrine; but it is a question—and with this question I now wish to deal—how far the drainage tube is really necessary, or for what length of time it should be used in the case of wounds inflicted by the surgeon under perfectly aseptic conditions. About the time that this paragraph appeared I had an amputation below the knee performed under not the most favourable conditions, in which the presence of a large blood clot did unquestionably seem to be of value in, or at any rate to cause no interference with, the healing process. This was the case of a woman, aged fifty, in whom a very bad displacement after fracture of the lower end of the tibia and fibula was gravely increased by a violent attack of delirium

tremens, and in whom it was found impossible to bring the bones into apposition or to secure union. Efforts in this direction having failed, her leg was removed below the knee on May 10th, two months after her accident, by lateral Stephen Smith flaps—a method of flap-formation, by the way, which is highly to be commended in amputation at the seat of election. The position of the flaps rendered a drainage tube unnecessary, although a very large amount of oozing was expected from the cedematous state of the tissues. The oozing of blood was very great indeed, but in the course of forty-eight hours, at the second dressing, it was seen through the opening which had been left at the most dependent part of the wound that the flaps were filled and distended with a large blood clot. This clot was subsequently watched with much interest. The skin healed by first intention, and at no time was there any pus. The clot gradually contracted in size, and became firmer and firmer, and it clearly aided largely in the filling up and consolidation of the stump, which was perfectly sound and firm when the patient left the hospital on June 16th. The stump had then, in fact, the appearance of one which had been formed for several months, and was absolutely free from discomfort. There can be no doubt, I think, that in this case the blood clot did what Professor Turazza claims for it, and it raises an important question as to the use of the drainage tube. Speaking as the result of general observation and experience, and without reference to any particular case, I should say that the sooner a drainage tube is removed the better is it for the healing process—that is, in aseptic wounds inflicted by the surgeon. The drainage tube performs its office of carrying off superfluous blood and sanguineous serum in the course of from sixteen to twenty-four hours. If its margins have been accurately adapted, the skin wound is healed in this time—sufficiently healed, that is, to render the parts beneath occluded from the air,—and any subsequent extravasation of blood, of which there is sure to be some in the course of the next forty-eight hours, will be dealt with by the tissues, as the tissues ordinarily deal with blood poured out in a true subcutaneous injury where there is no communication with the outside. Some of this blood will be reabsorbed, some—perhaps the greater part—will clot, and organisation forthwith proceeds in this blood coagulum, which fills up all the nooks and crevices of the wound. The clot acts as a sort of scaffold for the building up of new tissue; in other words, organisation takes place on it and in it, and the process of union, of healing, and consolidation is much helped thereby. If the drainage tube be left longer than the time named it is very prone to act as a source of irritation, and I feel sure that it is the frequent cause of suppuration and of apparent failure in antiseptic methods, simply because it has been retained too long. Seeming to act with perfect and needful efficiency because of the visible discharge on the dressings, it is all the while merely carrying off the fluid which itself has caused the tissues to exude. Professor Turazza would discard the tube altogether, and encourage the collection of blood and formation of clot, and his opinion clearly deserves the consideration of surgeons. Without going as far as he, I would say that each case must be dealt with according to its own conditions, and by no hard-and-fast rule. After some wounds no drainage tube is obviously needed, but in the large majority of cases where it is, the early removal of the tube will, I am convinced, conduce to the healing process and lessen the risks of failure and of suppuration. Accurate apposition of the skin, a dry dressing, and perfect rest—these are the essentials for rapid healing in the presence of ordinary cleanliness, by that obtained by purification of water, or with this or that antiseptic solution. With these precautions, and the very early withdrawal of the tube, the immediate healing of a wound seems, in my experience, to be a matter of almost absolute certainty; it matters not whether it be the extensive wound in an amputation of the thigh, an arthrectomy of the knee or the excision of a large breast, or the smaller wound such as is inflicted in the operation for strangulated hernia or the removal of a small lipoma. The surgeon secures the immediate closure of the wound, and all inflammatory action which may be set up in deeper parts by the injury of the operation goes on under subcutaneous conditions. We only need to use the drainage tube for the removal of that fluid which, if excessive and causing tension, will interfere with the perfect rest and apposition of the divided tissues. The use of the tube for this purpose is rarely demanded for more than from sixteen

to twenty-four hours, and the method of its *gradual* removal by cutting it a little shorter day by day is, I think, vastly inferior to that of its bodily removal at the end of the first day, or at the first dressing on the day after the operation, in less than twenty-four hours, even if its presence beyond this time be not positively injurious to the tissues and does not interfere with the process of healing.

The antisepticism of modern surgery has sometimes been derided, and it has been held that the drainage tube is the real source of all the good which is to be had from antiseptic treatment. The spray has had its day, and it will be strange if the drainage tube is to follow it. *Pace* Professor Turazza, I find it hard to believe that the drainage tube will disappear entirely from use, even in aseptic wounds. Experience, it is more probable, will lead to its being employed with greater discrimination and caution, and with better adaptation of means to ends, than heretofore; and towards this desirable result (for by it we shall have greater certainty in the healing of wounds) the paper of the Italian surgeon on the value of the hæmorrhage in the treatment of wounds cannot be without influence.

NOTES ON ULCERATIVE ENDOCARDITIS.¹

By HENRY McCLURE, M.D.

ANY contribution to the literature of ulcerative endocarditis must prove interesting to the profession, and the two cases I am about to give should prove doubly so by reason of the recovery of the patients. The first case is a recent one, the duration of the illness being sixty-eight days—that is, from the beginning till the temperature settled steadily down to the normal.

Miss C—, aged twenty-six, fairly well nourished, rather anæmic, menstrual function normal. Gouty family history. No history of rheumatic fever or rheumatism. Was seen first on Oct. 9th, 1886. Had complained of some pain in the back and chest for the previous week. She was coiled up in bed in extreme pain, which was referred to the region of the left kidney, with excessive tenderness on pressure. Pulse 80; tongue clean; temperature normal; urine cloudy, containing copious lithates, but no albumen. A morphia and ether mixture was given, with chloroform and opium applied externally.

Oct. 10th (second morning).—Still in great pain, which now seems to shoot from the original seat up the back to the left shoulder, with very anxious look; complexion dusky; pulse 109; temperature 103°; a distinct direct murmur heard at the second interspaces; some tenderness all over the abdomen; tongue coated with smooth white fur; thirst; no headache or nausea. Evening (7 P.M.): In much the same state; temperature 101.5°; pulse 100. Ordered salicylate of soda, in ten-grain doses, every two hours.

11th (third day).—Temperature 104°; pulse 110; pain less; very restless night; some delirium; urine contained traces of albumen (sp. gr. 1020); systolic murmur heard up into the neck, rasping in character. Evening temperature 101.6°; pulse 120, and very feeble. Brandy given and salicylate discontinued; quinine in four-grain doses to be given every three hours. Bowels had acted; motions natural in character. An Austin's inhaler with carbolate of iodine is now to be used frequently.

12th (fourth day).—Temperature 102°; pulse 106. Some delirium in the night; severe headache; no nausea; pupils react to light.

13th (fifth day).—Temperature 105°; pulse 120; respiration 28; headache; some delirium. Lungs carefully examined; nothing abnormal. Evening temperature 101°; pulse 110.

14th (sixth day).—Temperature 102°; breathing very shallow; respiration 28; constrictive pain round lower part of chest. Urine and fæces passed involuntarily. Evening temperature 103°; a roseolous rash observed on abdomen.

15th (seventh day).—Morning temperature 101°; some sickness, delirium, and headache; urine albuminous; sp. gr. 1018. As there is great difficulty in using the inhaler, an oro-nasal one was now substituted, with sponge saturated

¹ Abstract of a paper read before the Norwich Medico-Chirurgical Society.