genital phimosi. The wound, made by an eminent surgeon, did not heal, and in a few days it was covered by a diphtheritic membrane. The child was the son of a wealthy man, whose spacious house stands on the eastern border of Hyde-park. The two gentlemen in attendance upon the child, feeling sure that the unhealthy condition of the wound was the result of some insanitary surroundings, removed the patient to another house, where I met them in consultation, and where the wound soon assumed a healthy appearance and healed. With some difficulty I persuaded the father to have his house thoroughly inspected, when grave sanitary defects were discovered and corrected. Now, if this child, instead of undergoing a surgical operation, had been exposed to cold, and had thus got a catarrhal inflammation of the larynx, he would very probably have had a membranous exudation on the inflamed mucous surface, and the case might have been reported as one in which "the formation of false membrane in the air-passages had succeeded upon a definite exposure to cold."

It is only with reference to cases occurring in private practice, and especially amongst the middle and upper classes, that the inquiries which are requisite in order to throw light upon the etiology of these diseases can be thoroughly carried out. Cases occurring in hospital practice are, for the most part, quite unsuitable for this purpose, and it is a mistake to suppose that any trustworthy inference can be drawn from a large number of imperfectly observed and recorded cases.

In the last volume of the Guy's Hospital Reports there is a "Collection of Cases of Diphtheria and Croup," communicated by Dr. Hilton Fagge. In that paper, in the section headed "Cases of membranous pharyngitis or laryngitis due to local injury of the throat," I find, amongst other cases, one (Case 91) of a child who, having "swallowed a piece of hot potato, which lodged in his throat for some time," was found after death not only to have flakes of lymph on his tongue and tonsils, but the interior of the larynx and "the whole trachea were more or less lined with lymph." Now, surely it is inconceivable that this exudation in the air-passages was a result solely of a piece of hot potato in the gullet. In the history of this case it is said "there is no diphtheria in the neighbourhood," but nothing is stated, probably nothing was known, by the reporter with regard to the sanitary or insanitary condition of the patient's dwelling. In another case (93) of scald of the throat "a membrane was found on the pharynx and larynx, and down as far as the minute branches of the bronchial tubes"; and in a third case (94) of cut-throat there was "plastic lymph in pharynx and larynx, traceable into the smallest bronchial tubes." Surely these cases prove too much to warrant their being designated "cases of membranous pharyngitis or laryngitis, due to local injury of the throat." They prove that a membranous exudation spreading into the air-passages far beyond the seat of injury must have been due, not to the mere local injury, but to a diffusible, specific, infecting poison, the source of which might probably have been discovered by a careful investigation of the patient's surroundings before and after the receipt of the injury.

The result of my own investigations has been the conclusion that, in the absence of direct contagion, the occurrence of membranous pharyngitis or laryngitis affords conclusive evidence of infection by sewage-poison conveyed through either air or water. It will scarcely be denied that if this doctrine be true, it is of immense practical importance.

Savile-row.

ON

NERVE-STRETCHING IN ACUTE TRAUMATIC TETANUS: WITH TWO CASES.

BY EBEN. WATSON, A.M., M.D.,
SURGEON TO THE ROYAL INFIRMARY, GLASGOW.

THE effects of stretching upon the nerve-cords or their centres are not at present known with precision; but most experimental physiologists, as well as practical surgeons, are quite aware that nerves do bear considerable stretching without finally losing their characteristic properties. Attention was, I think, first attracted to this subject as a means of treating certain painful and spasmodic nervous affections by Nussbaum. Mr. Callender and others have since recorded their experience of the operation in cases of neuralgia, epi-

lepsy, &c. But, except a bare notice in the *British Medical Journal* for 1876 that M. Verneuil had had a case of tetanus at La Pitié which recovered after nerve-stretching, I have not been able to find any recorded case of traumatic tetanus treated in this way. Yet I am sure that most surgeons will agree with me that the suggestion thus made is at all events worthy of a trial. I certainly have much confidence still in the Calabar bean, which I believe I was the first to recommend, for the treatment of this terrible disease; but the operation of nerve-stretching does not prevent the use, while it may possibly assist the action, of the drug. Hence, when the following cases occurred in my hospital practice, I thought I was bound to give my patients the benefit of the proposed operation; and I now feel equally bound to make the result public without delay.

Before relating these cases, I may here remark that I have found the action of the Calabar bean of late very uncertain, so that I have sometimes doubted the genuineness of the drug. It is well known that the bean is much more potent at some seasons than at others, and if this is not attended to by those who collect and send them to market we may get a very untrustworthy article. Besides, I understand that the extract requires much care and a large consumption of beans in its formation, and hence, I fear, it is not always what we expect it to be, as, indeed, my second case illustrates.

CASE 1.—I. M—, aged sixteen, was admitted to the Royal Infirmary, under my care, on the 21st November, 1877. On the 7th of the month he had the tip of his left index-finger crushed off, and the wound was suppurating but not unhealthy when I first saw it. On the 18th day of the month, and the eleventh from the injury to the finger, symptoms of tetanus commenced in the usual insidious way; but he did not come to the hospital till late on the evening of the 21st, by which time the disease was fully confirmed and the boy's strength considerably diminished. Appropriate food and stimulants were given during the night, as well as several doses of the extract of Calabar bean; but, as the disease continued unabated in severity, I next morning proposed to my colleagues to stretch the brachial nerves, and, with their consent, I at once proceeded to perform the necessary operation.

The boy was brought fully under the influence of chloroform, and I made an incision about three inches long over the upper part of the brachial artery, at once exposing the median and ulnar nerves. Then, by separating the artery and vein and turning the former a little outwards, I readily came upon the musculo-spiral behind the vessel. All the three nerves named were severally hooked up on an aneurism needle and stretched. They were laid hold of between the finger and thumb, and pulled both upwards and downwards so strongly as to move the limb and to give to my fingers a feeling of slight fatigue. The operation was performed under carbolic spray, and after the nerves had been carefully replaced, the wound was stitched up and dressed antiseptically.

The patient was then put to bed, and on recovering from the chloroform had a general spasmodic paroxysm, after which, however, he seemed better. The Calabar bean, which was now given by subcutaneous injection, acted more powerfully than before, and he was able to swallow fluids fairly well, but his pulse and temperature continued high. His perspirations were profuse, and his strength continued to fail notwithstanding the free use of stimulants. This failure of strength was so great that the house-surgeon thought it prudent to diminish the frequency of the injection of the Calabar bean; and during the night of the 23rd he took a general convulsion, and died. A post-mortem was refused.

CASE 2.—A. F—, aged thirty-five, a drayman, was admitted to my wards on Nov. 16th, 1877. A lorry-wheel had passed over his left hand and caused a ragged wound across the palm of the hand, fracturing the two external metacarpal bones. My house-surgeon dressed it antiseptically at once, and I agreed with him next day that it did not call for operative interference.

On Nov. 24th he complained of a draught from a window near his bed, and said it had given him rheumatism in the shoulder of the injured limb. Next day his mouth and neck were a little stiff, but not sufficiently to attract attention. However, on the following morning, when I visited, the characteristic expression and other early symptoms of

tetanus were quite distinct. I at once summoned my colleagues in consultation on the case, and we all agreed that nerve-stretching should again be practised. Accordingly I at once cut down on the nerves of the arm as before, experiencing a little more difficulty than in the former case, owing, I suppose, to the greater size and fatness of the limb. The three nerves were exposed and thoroughly stretched in both directions, so as to tell at once on the injured part and on the brachial plexus. I also performed partial amputation of the hand, cutting away all the torn soft parts, in which were included the injured portions of the nerves. Antisepticism was carefully attended to, as usual with all my operations, and when his wounds were dressed the patient was put to bed.

As in the former case, on recovering from the chloroform, the patient had his first general fit of spasms. It was rather severe, but being treated by repeated injections of solution of the extract of Calabar bean. He had no recurrence of general spasms, and was soon able to open his mouth widely. Sleep was produced by moderate doses of chloral, and he took fluid food and stimulants abundantly for thirteen days after the operation. His pulse varied a good deal, and his temperature continued rather high, but on the whole I had great hope of a favourable termination of the case. I am sorry to say, however, that the extract of the bean, on which we had drawn pretty largely, ran short, and the new supply which was obtained never produced its physiological effect. Hitherto there had been no general convulsions, but only occasional and sometimes frequent spasmodic contractions about the neck, but on Dec. 8th, thirteen days after the operation, he got some trifling start, took a spasm in the neck as usual, but happened to bite his tongue. The fit immediately became severe and universal, and the house-surgeon, when summoned, found him dying. I am sorry to add that in this case, as in the previous one, the friends absolutely refused to allow any part of the body to be inspected.

In remarking upon these cases, I must first give it as my opinion that though they both terminated fatally, yet in both the progress of the disease was mitigated by the nerve-stretching. This was, I think, displayed even in the first case, though the patient only lived two days after the operation; for the fits were never so violent as they had been till the last one occurred in which he died. But it was much more manifest in the second case. Here the patient was a very big and powerful man; and in all probability, if let alone, his disease would have become extremely intense and cut him off in a very few hours; whereas he lived for thirteen days, and was really progressing favourably, when he was killed by a sudden exacerbation of the disease. For it ought never to be forgotten that during the whole progress of tetanus, and for some time after convalescence may be said to have fairly commenced, the patient is still liable to have the fits re-excited by very trivial causes, such as noises or surprises of any kind; and when this does occur, it is generally found that he is ill able to bear their violence; indeed he very frequently succumbs to their first onset. Hence it is an important rule of practice, but one not easily complied with, to save the patient from all mental disquietude. Now I am inclined to regard the death of my second patient as an instance of the accidental infringement of this important rule, rather than as a failure of the means employed for his cure. No doubt, as I have already mentioned, the extract of Calabar bean latterly used did not seem to affect him as the former supply did; but, had time been given, that could have been remedied; and, at the most, it can only be said to have laid the patient more open than usual to the incident which caused his death; for, under the full and effectual employment of the bean, I have known a similar termination of the disease take place more than once previously.

I am not an advocate for the performance of any operation that can be avoided after tetanus has set in, because I fear the effects of chloroform on such patients. I am certain that they are much more weakened by the anæsthetic than other patients, and I am still more certain that while recovering from its influence they almost always take a severe paroxysm, which may possibly be fatal. This, I suppose, arises from that same mental agitation which I have remarked on above, and which is natural to anyone when coming out of the chloroform stupor. Hence I do not approve of amputation or almost any other operation requiring the exhibition of chloroform in the case of tetanic patients. Unless, therefore, I were convinced that nerve-stretching had some favourable influence on the disease, I would neither recom-

mend nor practise it; but I confess I am now only able to say that it is an operation from which we may hope for some assistance in treating these very desperate cases. I could not, therefore, refuse any patient the benefit of it, though I am by no means sanguine of its giving us a very great numerical success. Most certainly I should not cease to use all the other means in my power as well as this operation. Complete seclusion, good nursing, appropriate food, stimulants, the Calabar bean, and occasional moderate doses of chloral are, in my opinion, the most likely measures to be taken. I must add that I have the same fear of chloral in large doses as of chloroform; for, though it puts the patient to sleep, it leaves him weaker, more excitable, and less able to contend with his disease. Nevertheless, a good many cases of so-called cure of this disease by chloral have been put on record, but I fear these are only instances of the fallacy of the argument *post hoc ergo propter hoc*, with which we are so much afflicted in medicine.

It may be interesting to some to know that my second patient, being lodged in the hospital near to the first, and hearing of his having lock-jaw before he himself took the disease was much afraid of it, and often declared he would take it. On one occasion he went into the room where the tetanic patient was lying, and was, of course, immediately ordered out by the nurse in attendance. Some may think that this strong mental impression had to do with the excitement of the disease in his case, but I myself cannot agree with that opinion. I can see no connexion between fear and any special disease, such as tetanus, and all practitioners of experience must have known many cases in which persons had the most lively apprehensions regarding particular diseases, while in nearly every case the alarm turned out to be groundless. I think the one now related is the only case in my experience in which the fear was verified in the history of the patient.

Glasgow.

THE TREATMENT OF TETANUS.

BY A. P. BOON, M.R.C.S., L.R.C.P.,
DISTRICT MEDICAL OFFICER, ST. KITTS, WEST INDIES.

THE treatment of tetanus has always been a subject of interest to surgeons, especially in the tropics, where the disease is comparatively frequent, where it is sometimes so prevalent that I have known surgeons refrain from operating, whenever it was possible, until the risk of the disease became less. It is well known that there is probably some connexion between tetanus and atmospheric disturbances, and I could, if it came within the scope of this article, adduce several interesting cases in support of this theory. It is admitted that, however much we may be in the dark as to the pathology of tetanus, we know that the mischief in the nervous system tends to right itself; it therefore seems to me that the main object of the practical surgeon, bearing this in mind, is to gain time, to keep death at arm's length; for every day the patient gets over improves his chances, and is a step towards recovery. Now, cases of tetanus may die of exhaustion, but rarely; I have never seen such a termination; they usually die suddenly of apnoea, from spasm of the muscles of respiration and of the glottis. What we have to do, then, is to keep up the patient's strength, and lessen, by all the means in our power, the severity and frequency of the tetanic spasms.

Four of the last five cases that have come under my notice having terminated in recovery, three of which were treated by myself, and two by my father, I think it worth while to record the plan of treatment; there is little, if anything, novel in it, but I venture to think that, if carried out carefully and thoroughly, it will be successful in a fair proportion of cases.

The cases are as under:—

CASE 1.—Traumatic tetanus, in a Portuguese boy, aged ten years, coming on thirty-six hours after a wound of the foot with a hoe. This case progressed favourably, the spasms becoming slight and less frequent under treatment; but on the night of the ninth day he was seized with a severe one, in which he died.