been in some measure beneficial in the majority. I shall presently refer to the various published cases; but, before doing so, I will give a short account of a patient under my own care on whom the operation was done.

John A., aged 48, a clerk, was admitted into St. George's Hospital on December 29th, 1880, under Dr. Barclay, who was kind enough to transfer him to me. *Family History.* His father died at the age of 60; his mother, aged 45, of "decline"; and four brothers of consumption. *Personal History.* The patient had rheumatic fever at the age of 13. When nineteen years old, he contracted syphilis—i.e., a hard sore appeared about three weeks after connection; but he did not remember any secondary symptoms. He married at the age of 20, and has had four healthy children. He told us that he had committed great sexual excesses before his marriage, but that he never felt the worse for them. Smoking and drinking disagreed with him, and he was always very moderate in these respects. His general health was robust, and he was much given to athletic exercises. In January 1877, he fell from a trapeze, and struck his back. He was much shaken, but was able to get up and walk home, and experienced no ill results from the accident. In the following June he had, for the first time in his life, an epileptiform seizure, preceded by giddiness, profuse sweating, and trembling, and followed by drowsiness. He had had five similar attacks subsequently, the last having occurred a month before his admission. During the time which had elapsed since the first fit (three years and a half), he had been gradually losing strength in his legs, and especially co-ordinating power, so that he soon became practically unable to walk in the dark. He had not noticed any modification in the sensation of the soles, but had frequent feelings of numbness and tingling extending over the whole left side of the body, and more particularly affecting the lower extremity. These sensations were always most marked before a fit, and were most probably of the nature of an epileptic aura. Shooting, darting pains, suddenly passing down the legs from the groins and thighs, had been frequent, and at times very severe. There had been several intervals of remission; but he had had them for the last six months nearly without interruption, although not so severely as on former occasions; they had latterly been accompanied by sharp constrictive pains round the waist. He had often suffered from "bilious attacks", with vomiting and epigastric pain, coming on suddenly without apparent cause, and subsiding in a few days. The bowels had been obstinately constipated, micturition slow, and sexual power abolished. *State on Admission.* He was a well-nourished, muscular man, with grey hair. The heart and lungs were normal; the urine free from albumen and sugar. The legs and thighs were well formed, and there was no wasting. They were moved freely in all directions as he lay in bed, and strongly extended when pressure was made against the soles. He knew their position in bed accurately, and there was no delayed sensation of pain when the soles were pricked. On getting him up, he was quite unable to stand without being supported on both sides; and, when he attempted to walk, the legs were brandished about in an irregular and purposeless manner—one foot frequently knocking against the other, and the heels being forcibly stamped on the floor. There was no ataxy of the upper extremities. The various reflexes were carefully examined by Dr. Myers, with the following results: sole and cremasteric absent on both sides; knee-jerk (patella tendon tap, quadriceps tendon tap, and depressed patella tap) absent on both sides; ankle (front tap, muscle tap, tendon tap, and clonus) also wanting on both sides. Sensation was also examined; and it was found that in the calf two points were not distinguished unless they were more than nine inches apart, and on the dorsum of the foot four inches apart. There was no inequality in the two legs. The pupils were equal and strongly contracted; they did not dilate in the dark, but did so, though not to the normal extent, during distant vision. Near and distant vision were normal, except for presbyopia, which was not excessive for his age. Ophthalmoscopic examination was impossible. *Treatment.* From his admission to January 15th, 1881, he was given bromide and iodide of potassium; perchloride of mercury was then added, and continued for a month, the only result being slight salivation. Fluid extract of ergot was next tried, and also proved of no service; there was not the slightest improvement in his condition. The pains, however, did not trouble him much till March 2nd, when they returned with great severity, and soon afterwards I determined to try the operation of nerve-stretching. *Operation.* This was performed on March 9th by Mr. W. H. Bennett, as follows. The patient being etherised, the left sciatic nerve was exposed at the lower border of the gluteus maximus by an incision about two inches in length. The nerve was then raised from its connections by passing the index finger beneath it, and dragged forcibly out of the wound, being raised about two inches above the skin. It was then grasped firmly between the finger and thumb, and the central end very

strongly pulled upon. The peripheral portion of the nerve was not stretched more than was rendered necessary by the raising of the nerve from its bed. The operation was performed antiseptically, the wound being brought together with silver wire. It showed remarkably little tendency to heal, and no attempt at union by first intention took place. On March 17th, some irritation from the carbolic dressings occurred, which necessitated their discontinuance. On removing the sutures, not the least union had taken place, the wound immediately gaping almost like a recent incision. Granulation followed very sluggishly, the granulations being weak and flabby, requiring continual local stimulation. The wound was still partially unhealed on April 20th (six weeks after the operation), when he was sent to the convalescent hospital at Wimbledon. *Result.* The effect of the operation on his pains was decidedly beneficial; they ceased entirely until April 2nd, when they reappeared in the left leg and thigh (operated side), but much less severely, and only lasted a few days. In other respects, however, there was not the slightest improvement. The spinal myosis persisted; the reflexes were about as before; sensation unchanged; he could stand no better; and the atactic movements of the legs were as marked as ever. *Conclusion.* He remained at Wimbledon in the same state until May 24th, on the afternoon of which day he suddenly uttered a moaning cry, became unconscious, and had a series of epileptic fits, affecting chiefly the left side of the body; he then became comatose, and died the same evening. *Post Mortem Examination* showed no affection of the thoracic and abdominal viscera. The brain also appeared healthy to the naked eye, but was not minutely examined. The spinal cord showed a patch of opaque adherent membranes in the lower dorsal region, and the posterior columns of a reddish-grey tint; it was put into a mixture of chromic acid and spirit, but, unfortunately, not well preserved. Microscopic sections, however, show extensive degenerative changes, most marked in the lumbar portion. The postero-medial and postero-external columns are in a state of advanced sclerosis, the neuroglia being much thickened and increased, and the nerve-tubes atrophied. The same changes are present in a lesser degree in the posterior part of the lateral columns.

[To be continued.]

ON THE TREATMENT OF STRICTURE BY STRETCHING.

By REGINALD HARRISON, F.R.C.S.,
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IF we put aside cases of organic stricture of the urethra, which are remedied by the occasional passing of a bougie, there yet remain a certain proportion where such treatment is insufficient. To take an example: a patient, having neglected the early indications of stricture, is seized with retention; with difficulty a small catheter is passed, and thus the urgency of his symptoms are met. It often happens that retention recurs, and all the difficulties attendant upon the first catheterism have to be gone over again, with, probably, considerably more spasm super-added. To meet such cases, immediately or remotely, a variety of expedients are practised. Of these, I may mention continuous dilatation, or the tying of an instrument into the bladder; internal urethrotomy; perineal section; and rupture, as employed by Holt. All these have for their object the passing of a full-sized instrument into the bladder, without which none of them can be regarded as satisfactorily completed.

For some time, I have occasionally been employing for this object a process which I think is best described under the term "stricture-stretching". In using this phrase, I do not wish to be understood as advocating the use of either a new instrument, or new treatment. I merely desire to state how I have applied well-recognised principles with equally well-known means. Stricture-stretching, as I endeavour to carry it out, is very closely in imitation of the process to which gloves are submitted by the salesman after the purchase has been made. Into each stall of the glove the glove-stretcher is introduced, in order that the fingers may the more readily pass in. If the manipulation be dexterously done, neither are the seams split, nor is the kid torn; if clumsily, a rent and a false passage for the finger is the result.

So much for the simile, now for the reality. The stretcher I employ is that much abused but valuable instrument, Holt's dilator; and the stretching is effected quite slowly, by the introduction of successive sizes of dilating rods, until the dimensions required are obtained. All this is to be done at one time, with or without an anæsthetic, according to circumstances. I almost invariably have the patient placed under ether, as it is important that the process should be slow enough to permit of the tissues stretching without tearing. I do not think we fully recognise the extent to which the urethra is capable of being dis-

tended. Dr. Otis of New York has recently demonstrated the truth of Sir Everard Home's observation: "That the urethra is everywhere much larger than had been supposed, exceeding the size of the largest bougie in use in a very great degree."* And what is true of the healthy urethra will be found to apply, though in a less degree, to the strictured one.

The adaptations in Holt's dilator, specially fitting it for this purpose, may be briefly stated. In the first place, there is attached to it a pilot bougie, which, in cases of tight or tortuous strictures, will be found invaluable. Though the pilot bougie may not be necessary for all cases where stretching is to be employed, yet, as this treatment is intended for some of the worst forms of the affection, it is as well to be prepared for every contingency. If the pilot bougie be not required, a round-top screw takes its place. Then I have increased the number of dilating rods to eight, so that the process of stretching may be gradual; and, in order that there may be no jerking as the several rods are introduced, a spiral spring controls the separation of the two portions of the instrument, instead of a screw.

The size of the dilator, before a rod is introduced, is No. 3, English gauge; the largest dilating rod brings it up to rather over No. 12—so that, between these two extremes, we have seven gradations in size. If the stricture is so tight as not to be capable of receiving the dilator, dilatation by means of filiform bougies must first be employed until the required size is obtained. Other instruments, divulsors and screw-dilators, as they are termed, have been invented for a similar purpose; but all I have seen are open to two objections: 1. They either tear or pinch with their sides the mucous lining of the urethra; 2. They are too large for use, except for strictures of the largest calibre. One of the best divulsors I know of is that adapted by Dr. Samuel Gross of Philadelphia. It is provided with an index at the handle, which shows precisely the extent to which divulsion has been carried.

A word or two in reference to the use of the instrument I employ for stretching. The patient being placed under ether, in the recumbent position, the dilator, with or without the pilot bougie, is passed fairly into the bladder, and then the rods are slowly and gradually introduced until a full size is obtained. The process generally occupies from ten to thirty minutes, according to the resistance, care being taken not to tear, and so cause hæmorrhage. I then withdraw the dilator, and pass a catheter, for the purpose of removing any urine that may be there. I usually give a dose of Fleming's tincture of aconite immediately after the stretching has been practised, and require the patient to remain in the house for twenty-four hours. A full-sized bougie is then passed every third or fourth day, until the patient has learnt how to conduct this operation himself, when he must be enjoined to continue this practice.

It will be seen that this proceeding differs essentially from what is so well known as Holt's operation. In the one, the object to be attained is stretching; whilst, in the latter, it is rupture. It is the only plan of treatment by which the strictured urethra is at once brought up to a full capacity, without break of tissue.

In conclusion, I would remark that I am not recommending this as a panacea, or as prejudicing other proceedings to which reference has been made; but as a safe and an efficient expedient for meeting immediate difficulties, and simplifying future treatment. If, in all cases of retention occurring with tight stricture, the use of this, or a similar instrument, followed the passing of the catheter, both patient and practitioner would be none the worse for the knowledge, that, whatever spasm might temporarily do, at all events there was a way to the bladder which had been made without any structural detriment, capable of admitting a No. 12 bougie. The dilator, as adapted for this purpose, was shown by Messrs. Krohne and Sesemann, in the International Medical and Sanitary Exhibition.

* On the Treatment of Strictures. Third Edition, p. 24.

ON A CASE OF CONSERVATIVE SURGERY.

By THOMAS ANNANDALE, F.R.S.E.,

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In the *Edinburgh Medical Journal* for June 1865, I published an account of the dissection of an arm, and illustrated the appearances met with by means of a woodcut, reproduced in Fig. 1. This arm was

Fig. 1.

sent to me by the late Dr. Fiddes of Jamaica, with the history that several years before the patient's death he had excised the entire radius for disease. A good recovery resulted, and the man was able to follow his employment, as a ship's pilot, until shortly before his death. The dissection of the arm showed that there had been no reproduction of the excised bone, but the hand had become turned round towards the radial side of the forearm, and its carpus articulated with this aspect of the ulna, which bone had become hollowed out at the point of articulation. The knowledge obtained by the history of the patient and by the dissection of his arm enabled me to practise the following conservative operation with success.

J. R., aged 34, mechanic, was admitted into the Edinburgh Royal Infirmary on the 15th November 1880. In May 1878, the patient fell and injured his left wrist. The accident was followed by swelling and pain, which symptoms were treated by various medical men by the application of splints and soothing lotions. After a few months of this treatment, he returned to his work; but the wrist remained swollen and stiff. One year after the accident, he noticed that the swelling was decidedly increasing in size; and, on seeking the advice of a surgeon, he was told that there was a tumour growing from the bone, and that a fracture of the bone had taken place in consequence. An operation was performed, and the tumour, together with some fragments of bone, was removed, and he returned to his work in about a month. Two weeks after this, the swelling again appeared; and, on applying again to his surgeon, he advised him to have the hand and wrist amputated. Before submitting to this proceeding, the patient came to Edinburgh to seek my opinion on his case; and, at first sight, I was inclined to agree with his own surgeon, and also recommend amputation. The condition of the disease, when seen by me, was as follows. There was a soft, lobulated tumour, of the size of a large cricket-ball, springing from the tissues on the dorsal and radial aspects of the wrist. The tumour involved the skin, and was firmly connected with the lower end of the radius for an extent of nearly

ROYAL INSTITUTION.—The forthcoming arrangements for the delivery of Lectures at the Royal Institution will include the usual Christmas course of six lectures, to be given this year by Professor R. S. Ball, the Astronomer Royal of Ireland, on the sun, moon, and planets (with illustrations by the electric light, etc.); eleven lectures by the new Fullerian Professor of Physiology; four lectures by Professor H. N. Moseley on corals; four lectures by Dr. P. S. Slater on the geographical distribution of animals; and three lectures by Professor Tyndall. The Friday evening meetings will begin on January 20th, at 8 P.M. Dr. W. Huggins will give a discourse on comets. Succeding discourses will probably be given by Mr. R. S. Poole, Professors Odling, Frankland, J. G. McKendrick, and W. E. Ayrton, Captain Abney, Mr. A. Tylor, Mr. T. W. Swan, Mr. W. Spottiswoode, and other gentlemen.