during trephination must, therefore, be regarded as the signal danger indicating the urgent necessity of relieving the intracranial pressure.

TOTAL ENucleATION OF THE PROSTATE FOR RADICAL CURE OF ENLARGEMENT OF THAT ORGAN.

A FURTHER SERIES OF 119 CASES OF THE OPERATION.

BY P. J. FREYER, M.A., M.D., M.Ch.,
SURGEON TO KING EDWARD VII'S HOSPITAL FOR OFFICERS, AND TO St. PETER'S HOSPITAL.

In my last paper on the subject of total enucleation of the prostate, published in the British Medical Journal of October 7th, 1905, I dealt with a series of 96 cases of the operation performed by me during the year ending July 29th, 1905, and concluded with a brief review of the results obtained in 206 cases of my operation performed by me down to that date. During the period that has elapsed since my return from my holiday on September 6th, 1905, to the end of July, 1906, I have operated on a further series of 119 cases, of which 30 were in hospital and 89 in private practice. The object of this paper is to place before the profession at large the results obtained from these operations. In my earlier series I gave full details of every individual case, and in my last two papers details of many of the cases, adding tables giving the date of operation, age of the patient, and medical man with whom seen or by whom sent, of each individual case. The present series is, however, such a large one that it is impossible within reasonable space to give in detail more than a few of the cases, or of some important features of the operation. Where almost every case is replete with interest it is difficult to make a selection.

CASE CVII.

Mr. aged 75, was seen by Dr. H. Murray Norris (London), September 8th, 1905. Prostatic symptoms for three years; lately intense frequency of urination and much pain. Catheter passed September 8th by Dr. Norris, and a large quantity of residual urine, which was alkaline, drawn off. Passed no urine subsequently except by catheter. I saw off 9 oz. residual urine, thick with pus and phosphates. Prostate enlarged to the size of a Tangerine orange, round, firm, movable. Patient very stout; intensely nervous. Next day there was much difficulty in introducing the catheter, which had to be tied in. Patient in great distress. On September 11th, Dr. Norris assisting, I enucleated the prostate, which weighed 15 oz., entire, with some difficulty, owing to adhesions caused by cystitis. Several small calculi were imbedded in the substance of the prostate and removed therewith. There were about a dozen calculi in the bladder the size of peas.

The patient passed several ounces of urine per urethram on October 5th, and wholly in this way after October 11th. He left for home October 13th in excellent health and spirits, able to pass and retain his urine as well as he ever did. I saw this gentleman on October 30th, when he was entirely well.

I have noticed that prostates containing calculi imbedded in their substance are more liable than others to be attended by severe cystitis, and that there is more difficulty of enucleation owing to adhesions contracted with the sheath and mucous membrane of the bladder.

CASE CXLIV.

On May 15th, 1905, an American gentleman, aged 65, resident of New York, consulted me on the advice of Dr. Kranz of Carlsbad. Prostatic symptoms had existed eight years. Catheter employed for six years, during which time patient was practically dependent thereon. Prostate much imbedded in the bladder, much pus, smooth, moveable, and bimanually felt prominent in the bladder. Urgent business required his presence in America, so operation was postponed till his return in November, when there was much difficulty in introducing the catheter and the urine was passed naturally.

On November 29th, 1905, I enucleated the prostate entire, Mr. C. Draine being the anaesthetist. The time occupied fromcommencing the suprapubic cystotomy till the prostate was delivered from the bladder was 5 minutes. The recovery was uninterrupted. Some urine passed naturally December 15th, and next day the suprapubic wound was healed. On January 2nd, 1906, he left the surgical home in excellent health, able to pass and retain urine, which was normal, as well as he ever did.

The prostate (Fig. 1), which weighs 2½ oz., is of peculiar shape, presenting a gutter-shaped outgrowth in the bladder 2 in. long resembling an epispadians penis. This is the second prostate of this shape that I have removed.

CASE CXLV.

This gentleman, aged 75, consulted me, September 12th, 1905, on the advice of Dr. McAfee, West African. Forty years previously he had retention of urine whilst travelling in Italy. Catheter employed for three days, after which the urine was passed naturally till two years ago, when the catheter was resumed. Has had cystitis, orchitis, and haemorrhage occasionally. Residual urine 1 oz., containing much pus and mucus, though the bladder was washed out daily. Prostate enormously enlarged, bilobed, soft, moveable. General health fair; patient very stout, with tendency to chronic bronchitis. Operation advised but postponed at patient's wish.

On December 15th I was summoned to Crowborough to see the patient with Dr. Basden. He had been confined to bed for nearly three months with cystitis, attended by rigor, high temperature (105° F.) and delirium from time to time. Condition very feebile; pulse irregular and intermittent, so that I did not consider it advisable to undertake the operation at that distance. On December 29th he was conveyed to London by ambulance. Health somewhat improved, but still feeble and flabby. On January 2nd, 1906, I enucleated the prostate entire, Dr. Basden, Dr. Adam Simpson, Liverpool, and Dr. L. E. Schmidt, Chicago, being present. The prostate (Fig. 2) was the size and shape of an enormous pear, two-thirds of which passed in the bladder. The right lobe had several nodular outgrowths. Weight 9½ oz. The enucleation was easy considering the size of the prostate and the condition of the patient, the time being seven minutes. There was little haemorrhage, and the patient was well borne.

Progress was on the whole satisfactory, though slow during the early days after operation, but he was able and there was no delirium. Had slight orchitis during the third week. When sitting up and convalescing, on February 10th, a sharp attack of bronchitis set in, for which I had the advantage of Sir Thomas Barlow’s care of the patient. By March 2nd the patient was again out of bed. A sharp attack of delirium, I tied in a catheter for a week; after its removal the urine was passed naturally. By March 14th the wound was firmly healed and the patient walking about, able to pass and retain his urine, which was quite clear, as well as he ever did. The patient is now in excellent health. The case gave Sir Thomas Barlow and myself much anxiety. Considering the patient’s condition his complete recovery was remarkable.

CASE CXLVI.

Gentleman, aged 75, seen with Dr. R. J. Roch, London, January 3rd, 1905. Prostate symptoms 10 years. Had retention in June, 1905; relieved by catheter, which had been irregularly employed ever since. Residual urine 1 oz. Lately there had been much difficulty in introducing the catheter. For several days he had suffered from rigors, and the temperature during the last two days 104° F., with mental symptoms amounting almost to acute mania, the result evidently of blood poisoning and uraemia. The prostate was enlarged to half a small pear, being bilobed, smooth, dense, and very tender on examination per rectum.
Owing to the pyrexia and mental symptoms I considered it advisable in the first instance to drain the bladder suprapubically, and later on, if these symptoms subsided, to complete the operation of enucleation of the prostate. Accordingly on January 4th I opened the bladder and inserted a large drainage tube.

On January 13th, the acute symptoms having subsided and the patient's general health having improved, I enucleated the prostate, which was pear-shaped with a plum-like outlet, from the right lobe; weight 24 oz. Rapid recovery. Passed 16 oz. of urine naturally January 21st; wound dry February 3rd.

On February 15th he went home in good health. On July 21st he wrote that he was perfectly well, able to pass and retain his urine as well as he ever did.

Amongst this series of 119 cases there were three instances in which, owing to the existence of certain conditions, I considered it advisable to drain the bladder temporarily before enucleating the prostate. Details of another of these cases will be given later on, to illustrate the varied conditions under which I regard this procedure as advisable.

CASE GXLXX.

Gentleman, aged 84, seen in consultation with Dr. P. L. Read, South Kensington, March 16th, 1906. Prostatic symptoms dated from 1905, accompanied by rigors during the last years. The patient drew off 15 oz. of urine daily till three days before admission, and had passed a bloody stool. catheter with a thickened, distended, and distressing urine, thick with pus and mucous. Prostate greatly enlarged, bilobed, dense; felt bimanually as a bulge in the rectum. On March 20th, Dr. Read assisting, I enucleated the prostate (Fig. 3) entirely, with a thin layer of the sheath adherent thereto, easily and rapidly, the time occupied being five minutes. The patient scarcely felt any inconvenience from the operation, and read the newspaper after the operation, the first day. Some urine passed naturally on April 8th, and the wound was closed on April 11th. He was sitting up out of bed on April 9th, and went for a drive April 15th. Within four weeks from the close of operation he resumed business in the City, and is now in excellent health, untroubled by any urinary symptoms.

The prostate (Fig. 3) weighs 74 oz. A thin layer of the sheath was left. The left lobe weighed 44 oz. It had almost incessant micturition day and night. He suffered much from thirst, dry tongue, bitter taste, nausea, and vomiting—symptoms more or less constant. He had chronic over-distention of the bladder, and which, no doubt, are uremic in origin. I drew off 65 oz. of pale urine of low specific gravity (1005), and containing pus, but I did not quite empty the bladder. The prostrate was about the size of a Tangerine orange.

By March 21st the patient's health had markedly improved, and all the uremic symptoms had disappeared, so on March 23rd I enucleated the prostate, which weighed 11 oz., entire in its capsule. On April 2nd some urine was passed naturally, and entirely in this way on and after April 6th. On April 27th he left the surgical home in perfect health, able to pass and retain his urine, which was normal as to its color and pungency.

I have heard from him recently. He keeps quite well.

CASE CCCLXVIII.

A gentleman, aged 65, resident of Durban, came to England to consult me with a view to operation, on the advice of Dr. A. McKenzie of that town. Prostatic symptoms had existed for four years. Catheter employed for three and a half years; entirely dependent thereon for ten months. Prostate greatly enlarged. On May 18th I drained and enucleated the prostate, which weighed 4 oz., entire in its capsule. In five and a half months. More blood was passed than usual, but pulse kept slow and full. Uninterrupted recovery. Passed some urine per urethram June 1st; wound dry June 3rd. Left the surgical home June 22nd, passed as he ever did. He is now in perfect health.

CASE CCCLXII.

W. L., aged 74, has been a patient at St. Peter's Hospital on and off for eight years, suffering from enlarged prostate and vesical calculus. During that period he has been operated on five times. He was operated on by Dr. Read with a catheter, having been admitted to the hospital suffering from chronic diarrhea and asthma; had mitral systolic and diastolic murmurs, with pronounced systolic thrills of the lower limit; very stout and flabby. Prostate greatly enlarged per rectum, the right lobe being more pronounced than the left, rather hard, and not very movable. During the past two or three years I had thought of enucleating the prostate, but the patient's condition was such that I hesitated in whom to calculate removed by me litholapaxis no less than fourteen times. Catheter employed for five years; entirely dependent thereon for eighteen months. The urine during the last three or four years has been thick, with a heavy deposit of pus, mucus, and blood. Two years ago I removed the right testicle for sloughing orchitis, but no relief to the prostatic symptoms. Patient suffering from chronic bronchitis and asthma; mitral systolic and diastolic murmurs, with pronounced systolic thrills of the lower limit; very stout and flabby. Prostate greatly enlarged per rectum, the right lobe being more pronounced than the left, rather hard, and not very movable.

On May 22nd, 1906, I opened the bladder suprapubically, and removed two phosphatic calculi the size of kidney beans. The prostate was then enucleated entire in two and a half minutes. It presented a broad, tongue-shaped outgrowth in the bladder, and weighed 4 oz. There was more haemorrhage than usual, as I almost invariably find the bladder in this condition. The latter little lobes, which occur in connection with enlarged prostate. The anaesthetic was badly borne, as on previous occasions with him during the litholapax operations, and he was much collapsed after the operation. He soon rallied, however, and was quite cheerful next day. Wound very slow in closing. Some urine passed per urethram June 27th; wound dry July 5th; went home July 12th. He is now in good health, the oedema having entirely disappeared, and can pass and retain urine, which is clear, as well as he ever did.

This patient's recovery is, I submit, truly remarkable, considering the unfavourable state of his health at the time of operation, and indicates that patients should not be allowed to die in agony unoperated on even under the most desperate conditions.

CASE CCLX.

An American gentleman, from Washington, aged 65, consulted me on May 22nd, 1906. Prostatic symptoms had existed for ten years, enlarged, globose, dense, moving with difficulty. Prostate now its capsule. In four months. Catheter employed for twelve years, latterly five or six times daily; severe haemorrhage from time to time. Prostate
TOTAL ENucleATION OF PROSTATE.

On May 28th, Mr. Thomas Nunn, London, and Dr. G. Clarke, London, Canada, being present, I enucleated the prostate entire in six minutes. Scuriously any bleeding. The prostate, a fine, pear-shaped specimen, weighs 9 oz.

The urine passed naturally on June 12th, and wholly in this way on and after June 14th. He left the surgical home June 30th, able to pass and retain urine normally. I saw the patient on July 17th on his way home to America. He was in perfect health, able to retain urine from four to eight hours, and pass it as well as he ever did.

Case CCLXII.

A distinguished physician from the North of Ireland, aged 80, came to me on June 14th, 1905, on the advice of Sir James Dick, R.N. Prostatic symptoms for fifteen years. Catheter employed two years. In great distress from pain and constant desire to urinate, due to cystitis. Residual urine, 8 oz., contained much muco-pus. weighed 2 oz. I removed his prostate suprapubically, and weighed 91/2 oz. After twenty minutes the patient passed urine, which was normal, as well as he ever did. On July 17th he wrote: “Since my prostate was removed I am a new man. I am not only free from pain and torture of frequent urination, but the normal functions of the bladder are completely restored.”

Case CCLXIII.

An eminent French physician came from Paris to consult me June 12th, 1906, with a view to removal of his prostate. Suffered from prostatic symptoms for six years. Retention of urine two years ago; entirely dependent on a catheter自此. Some urine passed naturally June 28th; wound dry July 3rd. On July 7th he was walking about quite well, and able to pass and retain his urine, which was normal, as well as he ever did. On July 17th he wrote: “Since my prostate was removed I am a new man. I am not only free from pain and torture of frequent urination, but the normal functions of the bladder are completely restored.”

On June 12th, 1906, Surgeons-Generals J. Cloghern and W. R. Browne, I.M.S., and Dr. Emery of Toronto being present, I removed 11 calculi, weighing 91/2 gr., superimposed, and then enucleated the prostate, which weighed 24 oz. entire in its capsule. Fourteen minutes elapsed from commencing the operation till the prostate was delivered from the bladder, ten minutes being occupied in removal of the calculi.

Multiple calculi. Some urine passed naturally June 20th. On July 1st he passed 16 oz. at once in full stream and with great ease. The suprapubic wound being slow in entirely closing, a soft catheter was tied in from July 18th till July 26th. On its removal, the whole of the urine was passed normally. He walked and drove out July 28th, and on August 4th he returned to France in excellent health, able to pass and retain his urine, which was normal, as well as he ever did.

The ages of the patients varied from 50 to 86 years, the average age being 68 years. The prostates weighed from 4 oz. to 9 oz., the average being a little over 2 oz. In comparison with these 119 operations there were 9 deaths, or 7 1/2 per cent., the remaining 110 cases having been completely successful. The causes of death were:

1. One from pneumonia embolism on the fifth day. I saw the patient an hour before his death, and he had had no unfavorable symptom up to that time.

2. One from shock seven hours after operation.

3. One from shock seven hours after operation.

4. Six from uraemic symptoms, from three to thirty-nine days after operation, in all of which the kidneys were extensively diseased before operation, and patients were found to be suffering from cancer of the bladder at the time of operation; and in one case the bladder was literally full of phosphatic calculi.

Though all these deaths are accepted as occurring in connexion with the operation, the fatal result in most of the cases occurred from diseased conditions previously existing rather than from the operation. In the operation of the patient that died from pulmonary embolism—an accident liable to occur from any operation—they were all desperate cases, in which operative interference was postponed till catheterism could no longer be employed, and when the patients were practically moribund. But to refuse to operate in such instances would mean the sacrifice of many lives, as the details of cases in this and Fuller’s method of sweeping testimony. Amongst these 119 cases I had a consecutive series of 39 operations without a death. Taking the advanced ages of the patients the subjects of this disease into consideration, I wish to say that there is no more successful operation in surgery in experienced hands, provided it be undertaken before the kidneys become seriously diseased.

In the April number of the "Australasian Journal of Surgery" for 1904, Dr. Eugene Fuller, of New York, lays claim to having been the originator of the operation which I have described as my own. A similar claim was advanced by him during the controversy that ensued on the publication of my first lecture on the subject in the British Medical Journal of July 20th, 1901, and its abridgement demonstrated in the issue of that Journal of August 17th, 1901. I should not, therefore, be necessary to refer to the subject again, only that Dr. Fuller now publishes in support of his contentions a somewhat belated letter, dated February 5th, 1905, written by him by Dr. Ramon Guiteras of New York, in which this latter gentleman alleges that when passing through London in 1900 he explained to me Fuller’s method of sweeping embolism, and his own modification thereof; and then I am accused of having published their combined method as my own without any reference to either the two methods.

It is true that I did not allude to the work of either of these gentlemen, for the simple fact that, as I shall presently show, there is no similarity between my operation and that described by Dr. Fuller; and the “instruction” alleged to have been given by me to Dr. Guiteras exists only in the imagination of that gentleman.

Dr. Fuller bases his claim to having originated the operation which I have described as my own, and published in the Journal of Cutaneous and Genito-Urinary Diseases of June, 1895, entitled “Six Successful and Successful Cases of Prostatectomy.” Turning to this article we find that not alone was this claim made by Dr. Fuller radically different from mine, but that his operation was purely a partial prostatectomy of the McGill type, bearing no resemblance to mine. In the operation described by Dr. Fuller—(1) a perineal section is made in addition to the suprapubic cystotomy; (2) the suprapubic wound is closed by deep and superficial
sutures; (3) an attempt is made to render the prostate prominent in the bladder by pressure of the flat on the posterior cutting-edge of crushing instruments, or by cutting the urethral opening, "the cut extending from the lower margin of the internal vesical opening of the urethra backwards above and a little below which the floors and accessories are, it will have been observed, foreign to my operation.

Let us now examine Dr. Fuller's 6 cases in detail to ascertain the extent and nature of the prostatic substance removed in each instance, and see if this bears any resemblance to that removed by me as already described and figured. The description of what was removed will be given in Dr. Fuller's own words.

**CASE A.**-I removed a large left lateral hypertrophy and the median hypertrophy, which last was moderate. Owing to the bad condition of the patient I did not wait to remove a small left lateral hypertrophy.

**CASE B.**-I enucleated in the way described a large collar-like hypertrophy of the prostate.

**CASE C.**-I found two large lateral hypertrophies. The median hypertrophy was not marked. These hypertrophies were not truly enucleated without difficulty. As the result of the operation a very hard large lump was left in the bladder, and this lump was lying transversely across the floor of the bladder just at the vesical neck. This was cut away by the knife in making the perineal incision. It was, however, so fibrous and so firmly attached to the capsule of the prostate that it was found impossible to enucleate it, and consequently had to be cut away by the use of both the serrated scissors and of prostatectomy cutting forceps.

**CASE D.**-I enucleated two large lateral hypertrophies, but in one, I will no mass comes away in one piece.

**CASE E.**-I enucleated two large lateral hypertrophies, together with a collar-like median hypertrophy, partially surrounding the urethra.

It is simply ludicrous to claim that these were total prostatectomies, resembling that described and practised by me. One (Case D) is a perineal operation pure and simple. In one (Case A) Dr. Fuller "did not wait to remove a small left lateral hypertrophy". They were only enucleated as far as they projected upon the bladder, and with its capsule out of the enveloping sheath of rectovesical fascia. It was the discovery that this could be accomplished—contrary to the then accepted teachings of the profession, that constituted the essential point in my operation. We can in consequence approach our task—that of removing the prostate entire, and the prostate only—by a simple and scientific plan of campaign, instead of the crude and unscientific methods previously practised by McGill and his imitators, in which scissors, cutting forceps, and scoops of all kinds were employed to cut and tear away portions of prostate, leaving others behind, and frequently removing portions of the bladder and other tissues beyond the limits of the prostate, with such fatal results that for some years before 1901, when my operation was placed before the profession, these operations had been practically abandoned.

The objects figured as removed in cases E and F in Dr. Fuller's series are obviously mere masses of prostate, and bear no resemblance to the cleanly enucleated entire prostate figured by me, which the number of over 300 have been preserved in my private collection or presented to public museums, and which have been seen by and examined by scores of Dr. Fuller's countrymen. I challenge again, as I have repeatedly challenged, the production of a single authentic specimen of entire prostate from any museum in the world, placed there before the publication of my first series of cases in July, 1901, with any published illustration thereof, or description of what had been removed in its absence. There was no such specimen in the great Hunterian Museum of the London College of Surgeons till, at the request of the Curator, I presented a dozen specimens therein.

Dr. Fuller's idea of what constitutes a total prostatectomy is not less strange than his conception of what constitutes a successful operation. Describing the condition of Case E he writes: "Four weeks after the operation the patient sat up, and now, six weeks after, the result was considered very satisfactory, with the help of an attendant. The urine, now clear, still comes through the granulating suprapubic wound, which isa very slight one, the patient is quite free from pain, and I feel that urination will be accomplished without difficulty. The uremic symptoms have not disappeared, but are considerably less, the awakening of the kidneys is gradual, and if any I am fully convinced that in time he will succumb to his nephritis, and such is to be expected, especially since, owing to his poverty, comparatively little can be done for him."

Let the reader imagine himself in the position of this patient, and say if, under the circumstances, he would regard the operation as successful. But what matters it what the reader thinks, since Dr. Fuller adds the irreconcilable testimony of Mr. MacRitchie, that the effect that it was entirely successful? In his article in the *Annals* Dr. Fuller writes: "Mr. Robson concludes his reference to me with the remark, 'Moreover, Dr. Fuller's cases referred to above are all successful'. I scarcely think that even the testimony of Mr. Robson will convince the reader that this case was either "successful" or "completely cured'."

Dr. Fuller quotes freely from the letters of my opponents in the controversy that ensued in the *British Medical Journal* on the publication of the first four cases of my operation, and adds, "any one interested can read them." Yes, indeed, and interesting literature they will prove in the light of subsequent events. But considering the triumphant success of my operation, and vindication of the views I then enunciated, I would venture to suggest that, for the credit of the profession, a veil might be drawn over the misrepresentations, misstatements, and sophistry with which I was then assailed, when I stood practically alone—a fate which I have enjoyed in common with every pioneer of any great advance in surgery or medicine. With reference to Dr. Guiteras, the statement of Dr. Guiteras's letter of February 5th, 1906, published by Dr. Fuller in his *Annals*, to the effect that when in London in 1900, on his way to Paris, where he read a paper before the International Medical Congress on the result of the treatment of prostatic hypertrophy, he met me and explained Dr. Fuller's method of operating, and his own modification thereof, I was not previously aware that I had had the honor of this gentleman's acquaintance. He does not state in his letter where the interview took place, but Dr. Fuller supplies the omission by locating it at St. Peter's Hospital, a fact that would indicate that this letter was not the only communication between these gentlemen on the subject! I presume that, like scores of his countrymen—who are always welcome—he honoured me with his presence in the operating theatre. But I have no recollection of having ever conversed with him on prostatectomy or any other subject; and certainly if any such conversation did take place it left no impression on my mind.

It is fortunate, under the circumstances, that the paper read by Dr. Guiteras in Paris is published in *extenso* in the *New York Medical Journal* of December 8th, 1900, so that we are in possession of the exact words and scope of Dr. Fuller's operation. After describing this operation, he writes:

In this way the bulk of the prostate can often be shelled out in three large pieces, with very little hemorrhage or sciatica. Enucleation cannot always be performed by this means, and frequently the operator has to be content with the removal of a piece from the principal part of the prostate.
the operation described, whether in its technique or in its scope, bears no resemblance whatever to that which bears my name.

Dr. Fuller published the description of his operation with 6 cases in June, 1895, but his teachings seem to have fallen on deaf ears. No one ever seems to have thought it worth while to point out the resemblance it bears. I have been rather, it seems, then fallen into the favour. So far as I am aware, his name was never referred to on this side of the Atlantic for more than six years after—till it was unearthed from the dusty archives of the Medical-Chirurgical Society by Mr. Mayo Robson during the controversy that ensued on the publication of my first lecture on my operation in July, 1901, and then only after the attempt by Mr. Robson to father my operation on himself had been exposed and refuted. I am not aware that in his own country it fared much better. Contrast with this the profound interest elicited by the publication of my operation; while dissemination in number and intensity and length of span was evident at once after the use of antitetanic serum. The dose of serum given is also noteworthy. In all, 120 c.c.m. were given; this required twelve separate punctures, and cost £2 8s.

The interesting points about this case are: First, the absence of any apparent inlet, except the foul mouth, for the germ; secondly, the slow development, and this bears on the happy issue of the case; thirdly, the loss of weight (3 lb. 14 oz.) while the spasms continued, and the steady gain after they ceased; fourthly, the almost normal temperature while the convulsions were at their worst, and the high temperatures occurring after the use of oxin rashes; fifthly, the treatment. Here it is noteworthy that, though the chloral and bromide made him sleep, they had no apparent action on the spasms; while diminution in number and intensity and length of span was evident at once after the use of antitetanic serum. The dose of serum given is also noteworthy. In all, 120 c.c.m. were given; this required twelve separate punctures, and cost £2 8s. The authorities recommend 400 c.c.m. in all, which would mean forty punctures, and a cost of £8; but surely few patients could stand this. It seems desirable that both the cost and the bulk of the remedy should be somehow lessened. Yet my conclusion is that in a case of tetanus, whatever the pain and whatever the cost, antitetanic serum should be fairly tried, and with as little delay as possible.

**CASES OF TETANUS TREATED WITH ANTITETANIC SERUM: RECOVERY.**

J.—By W. WINSLOW HALL, M.D., M.R.C.S., LONDON.

The following case affords an example of the value of antitetanic serum:

A. B., aged 23 years, previously healthy, of a family prone to rheumatism and otitis media, was brought to me on August 19th, 1906. It was said that his breath was offensive, and that he screamed at nights. The tongue, and the mouth generally, were swollen and sore.

On August 21st I saw him at his own home. He had stiffness about the neck, and a slight riaus sordidus; but his father maintained that this painful smile was his natural expression; the pulse was good, and the temperature was normal. I could find no physical signs of disease other than the foul mouth. The bowels were cleared out with calomel, and potassium bromide gr. 5 was given every four hours. On August 19th the condition was unchanged. On August 20th the rash was more marked, and the parents volunteered an account of opisthotonos occurring during the night; the pulse was 72, the temperature 98.6°F. I took the boy into St. Monica’s Home Hospital; there the mouth was carefully treated with boric acid, and afterwards with hydrogen peroxide. He was given chloral hydrate gr. 5, and potassium bromide gr. 75 every two hours.

On August 21st it was reported that he had slept, but that spasms had occurred every ten minutes during the night. Riaus sordidus was unmistakable, as a spasm occurred in my presence, opisthotonos was equally unmistakable. He could swallow slowly, but with pain. Grey, palpebral ulcers were visible over the tongue and cheeks, but full examination of the mouth was impossible, owing to rigidity of the jaws. The pupils were small and equal, and the eyeballs rotated down. There was no otorrhoea, but the right membrana tympani was thickened and opaque. The skin reflexes in the abdomen and the lower extremities continued unduly brisk.

At 5 p.m. 60 c.c.m. of antitetanic serum were injected in the ileo region. The chloral and bromide mixture was given four-hourly.

On August 22nd the boy’s condition had improved. There had been only 23 spasms in twenty-four hours, against some 98 in the preceding day and night. The temperature was 98.6°F; the pulse rate 108, and the respiration 22 to 28. The tongue was cleaner. Nourishment was improved. The chloral and bromide mixture was given six-hourly.

On August 23rd, the patient looked brighter; only eight spasms had occurred in the twenty-four hours; the tongue was still cleaner, and he had swallowed two pints of milk since the preceding morning. On August 25th only seven spasms had occurred. On the morning of August 26th the number of spasms for twenty-four hours were being cleaned off the tongue. On August 27th the reflexes had reappeared up to the level of the epigastrum. The chloral and bromide mixture was given thrice daily. Spasms were still absent, nor, with the exception of one spasm at 2.30 a.m. on August 31st, did they recur. The tongue ulcers naturally did not heal, but were not free from ulceration till September 10th. His convalescence was chequered by a rise of temperature to 100° and 102° on September 3rd and 18th, and 21st respectively. He had an urticarial and erythematous rash. On September 14th he was allowed up. On September 19th he was sent home convalescent home. He is now at school, and is perfectly well.

**II. By EUSTACE G. CARTER, M.R.C.S., ESG., CHAPL.-ALLETON, LEEDS.**

Professor Sims Woodhead, in Allbutt’s System of Medicine, states: “Of those cases where the incubation period is under ten days not more than 5 to 4.5 per cent. recover; whereas the incubation period was under ten days, almost all patients attacked throw off the disease.” In the case described below the incubation period was seven to eight days, and belongs, therefore, to the more serious group. I think, therefore, to the antitetanic serum must be given the credit for the favourable termination of the case.

On the evening of July 24th, 1906, I was sent for to a young farmer aged 22, who had fallen from a wall and strafed a diaphragm stick, causing a lacerated wound of the scrotum, and exposing both testicles, which were otherwise uninjured. As is frequently the case in those that work in the land, the wound in the abdomen of the wound was extremely dirty, and it took a considerable time to cleanse it even comparatively; the wound was therefore left to heal by first intention. He had no emetic or other symptom of constitutional disturbance till the morning of August 1st, eight days after the accident, when he is said to have become worse, and the edges drawn together with cautery sutures. The wound suppurated, and at least a square inch of the scrotal arch was detached. On the 5th, however, after two days, he was a little better, and a slight sense of stiffness about the angles of the jaws and difficulty in opening his mouth. Within four hours I injected 10 c.c.m. of antitetanic serum, prepared by the Pasteur Institute, under the skin of the abdomen. The general condition of the patient was good, temperature normal, pulse 72, respirations 16.

When I saw him on the following morning he had passed a restless night, the rigidity of the jaws was more marked, and accompanied by stiffness in the muscles of the abdominal wall and lower extremities. I injected 10 c.c.m. of serum, and ordered 20 gr. doses of chloral hydrate and potassium bromide every four hours, to be discontinued if the patient became too somnolent; the same evening 10 c.c.m. of serum were injected as before.

On the morning of August 3rd the nurse reported to the patient that had passed a restless night, the rigidity of the jaws was more marked, and accompanied by stiffness in the muscles of the abdominal wall and lower extremities. I injected 10 c.c.m. of serum, and ordered 20 gr. doses of chloral hydrate and potassium bromide every four hours, to be discontinued if the patient became too somnolent; the same evening 10 c.c.m. of serum were injected as before.

On the morning of August 5th the nurse reported that the patient had passed a restless night, and that he had had several convulsions, accompanied by stiffness in the muscles of the jaws, abdomen, and thighs more marked, so I injected 20 c.c.m. of serum, which as I inserted the needle the patient became almost a picture of pronounced opisthotonos. There being no change for the better in the condition of the patient, on the next day injection of 30 c.c.m. of serum was given. On the morning of August 6th the nurse reported that for two or three hours after each injection of the serum, there was an attack of spasms; otherwise he remained much the same. This I found to be the case after every subsequent injection.

The object of this case is to give a detailed account of the progress of the case from day to day; the patient was now in the midst of an attack of acute tetanus, which lasted for two weeks, during which time he was not brighter; that is to say, the senescent phase of tetanus. The final convulsive seizure occurred on the twenty-eighth day after the onset of the trismus. For some days longer, however, there remained some stiffness about the