further progress of the case is accompanied by gradual participation of the ureters and kidneys in the septic inflammation, and the patient is gradually exhausted. Acute general tuberculosis may terminate his sufferings.

Age.—The ages of the patients usually range from 19 to 40 years.

Use of the Cystoscope.—The lecturer had inspected two cases of advanced disease by the cystoscope, and the surface was irregular, with pits at the uvula vesicæ or neighbouring part of the floor of the bladder, partly filled with shreds of tissue, muco-pus, and blood clot, though in those cases cystitis, ulceration, burrowing abscess in the floor and walls of the bladder are usually super-added before death.

Differential Diagnosis of Tubercle in the Prostate.—In early cases the presence of tubercle elsewhere may be wanting, as the prostate is often affected before other organs. The disease most commonly suspected when tubercle is irritating the prostate is stone in the bladder. The urine is at first only moderately turbid in both. In prostatic tubercle there is often a gleet, or history of such having continued since an attack of gonorrhœa; a little shreddy mucus may be washed out with the first portion of urine voided, the remainder being only slightly turbid. In stone, on the other hand, a drop of blood often comes at the end of the stream instead of pus at the beginning. When blood comes from the prostate it is usually washed out first as coagula mixed with curdy pus. If the patient be sounded and stone be there, it can be generally detected. Sounding does not always discover any alteration in the shape of the prostate or trigone unless the tuberculous disease be far advanced. The distinctions of vesical tumour from prostatic tubercle are so great that confusion is not likely to occur. Tuberculous pyelo-nephritis creates symptoms which often suggest disease of the neck of the bladder. In these cases the absence of change in the condition of the prostate and the presence of tenderness in the renal regions indicate the real seat of disease.

Treatment of Tuberculous Prostatitis.—In the early stages the catarrh must be cured, and the general treatment for tubercle applied. In the later stages the ragged cavities must be carefully washed out. A good antiseptic solution is two grains to the ounce of sulphate of quinine, two ounces being injected and left in the bladder after the pus and urine are well cleared out by repeated small injections of boric acid solution. Still more antiseptic is an emulsion of iodoform. In cases of chronic cystitis, if the bladder is well washed, and a couple of drachms of this emulsion injected, the most foetid ammoniacal urine is replaced by acid urine, fœtor disappears, and the pus rapidly diminishes. In cases of cystitis caused by neglect of prostatic retention, the urine in ten days becomes quite free from deposit, and even when calculus or tumour or malignant ulceration co-exist, the improvement is enormous. The lecturer exhibited two diagrams copied from drawings made of the floor of the bladder viewed by the cystoscope, which showed an early tuberculous ulcer of the mucous membrane before and after healing. This was cured by washing out the bladder with an injection of iodoform emulsion, so that in a fortnight the patient, a man with advancing pulmonary tubercle, was cured of his bladder trouble. When the pain of washing the bladder is severe, cocaine previously injected often renders the operation bearable. When things are too far gone for this, ether should be given while the bladder is thoroughly washed with a large silver catheter and Clover's extracting bottle, then a drachm of iodoform emulsion is injected and left in. Subsequent washings may then be carried out with very little suffering. The formula for the emulsion is: iodoform, 2 parts; mucilage, 4 parts; glycerine, 2 parts; water, 20 parts.

Perineal Section.—In former years the lecturer had found it necessary to do perineal section in order to obtain constant drainage when the urine could not be restored to a healthy state by other means. But the use of iodoform emulsion may prevent this necessity when perineal drainage is carried out. The daily washing is still as needful as when the urine is voided by the urethra. The effect of this thorough drainage is so great that patients feel strong and well while it is continued, and a permanent cure by this method may be attainable. In a patient under the lecturer's care in University College Hospital, the bladder trouble was kept in complete abeyance, if not quite cured, and the patient grew stout and strong, until he sank under rapid tuberculous meningitis.

Demonstration of the Endoscope and Cystoscope.—At the conclu-

sion of the lecture the endoscope and cystoscope were shown. Grünfeld's endoscope, illuminated with light from a kerosene lamp, was inserted into the urethra of an ox. Leiter's endoscope, illuminated with electric light, was used to explore the urethra in a patient with chronic urethritis. There were several cystoscopes: Two of Dr. Nitze's, and two of Leiter's (a modification of Nitze's). Nitze's is of better shape than Leiter's, but Leiter's has the most powerful illumination. One of Nitze's has been reconstructed by Mayer and Meltzer, so as to permit of a free flow of water through the bladder, by which blood and pus are cleared away and the contents of the bladder kept translucent during introspection. Introspection was made in "phantom" or dummy bladders, on the interior of which mock papillæ and orifices of ureters had been painted. These were borrowed from Mr. K. Schall, of Wigmore Street, Leiter's agent in England, who also superintended the batteries employed for illuminating the electric lights. Just too late for this exhibition, Mr. Schall received an irrigating cystoscope from Leiter, which is of extremely ingenious construction, and promises to be efficacious.

SOME CASES IN PRACTICE BEARING UPON THE FUNCTION OF THE PROSTATE.

By REGINALD HARRISON, F.R.C.S.,

Surgeon to the Liverpool Royal Infirmary, and Lecturer on Clinical Surgery in the Victoria University.

MANY examples will occur where both to the pathologist and surgeon the observation of processes of disease in organs of the body, as well as the operative procedures necessary for their relief, have proved of service in assisting to determine the purpose and function of the part in question. In my Lettsomian lectures (1888), I laid stress on the muscular action of the prostate relative to micturition, independently of its glandular association with the generative act, whatever the latter may be. In this muscular exercise I included (1) a sphincter action, such as we know of in connection with all outlets from the body, and (2) the provision of a muscular basis for supporting the bladder and its contents. The latter purpose seems to have been insufficiently recognised, not only as a normal and well defined function of the prostate, but relatively to that form of hypertrophy of the part which constitutes disease.

In the first place, it will be noted that all deep sections of the prostate radiating from the urethra outwards, deprive it for a time of its sphincter power, and thus render it incapable of controlling the retention of the urine. Of wounds of the prostate which may cause temporary or permanent incontinence, we have instances in the deep incision of lateral lithotomy. In the ordinary median operation, the prostate is not touched with the knife, hence, where the stone is not large and the amount of dilatation or prostatic tearing is not great, the patient may never entirely lose control over the urine. This is one of the objections to the median operation, where for some reason or other it is necessary to subject the bladder to a process of involuntary drainage. In the few instances which have come under my notice where, in the male, lateral lithotomy has been followed by permanent incontinence of urine, I have no doubt that the prostatic ring has been completely severed either by a too deep incision or by the tearing of the parts in the extraction of the stone. Under these circumstances it is hardly fair, on reflection, to urge such an occurrence as an objection against the operation of lateral lithotomy.

The power of the prostate in retaining urine is further evidenced in those cases where the urethra has either been extensively or completely ruptured in its membranous portion, just in front of the apex of the prostate. Where such an accident happens, retention of urine immediately occurs, and continues until the degree of tension on the outlet of the bladder becomes such as to paralyse it; in this way time is given for Nature to repair in, and for art to interfere. In numerous cases of this kind where I have opened the perineum in the median line within twenty-four hours of the accident, for the purpose of providing an escape for the urine, it has been noted that though the bladder may have been distended, there was no evidence that extravasation of urine had occurred. The contracted condition of the prostate as determined by the finger has, as I have frequently pointed out, been quite sufficient to explain this. In the case of the last patient I operated upon, that of a young man aged 22, who was

admitted into the infirmary on May 1st with a ruptured urethra and a fractured leg, caused by being run over, though sixteen hours had elapsed since the accident, and the bladder was largely distended with bloody urine, there was not the slightest evidence that any extravasation of urine into the contused perineum had taken place. Here the prostate was so firmly contracted as to grip my finger with considerable firmness as I pressed it along the prostatic urethra, prior to the introduction of the drainage tube. This condition of the prostate I have frequently drawn attention to under similar circumstances.

In connection with wounds of the prostate, allusion may be made to various operations which are now being practised for the removal of portions of it when it becomes hypertrophied. Where this is extensively done so as to include the greater portion of the ring, incontinence of urine is certain to follow. In a case I recorded¹ where the prostate was almost entirely extirpated for carcinoma, though the patient lived for over twelve months, and was able to resume his out-door occupation, he had incontinence of urine, which was pretty successfully remedied by the use of a sort of perineal truss which I had specially made for him. The patient eventually died of a recurrence of the disease in the neighbouring glands. I showed the part removed at a meeting of the Royal Medical and Chirurgical Society, in connection with some remarks on the operative treatment of the enlarged prostate.

The experience of the operative surgery of the urethra seems pretty clearly to show that to render a male temporarily or permanently primarily incontinent of urine, the lesion must involve more or less of the continuity of the prostatic circle. The examination of persons who have died within ten days after lateral lithotomy affords direct evidence in support of this conclusion.

Similarly, certain disintegrating diseases of the prostate may be followed by the same consequences. Of these, I may mention some of those rare instances where calculi have formed within the prostate and have been removed from it by operation. I have now a case of this kind under observation (the particulars of which I hope to publish after the lapse of a little more time), where I fear the power of retaining urine will be much restricted. On referring to the remarkable case of this kind recorded by the late Dr. T. H. Barker,² of Bedford, where a large prostatic calculus was removed by perineal incision, it was reported that though recovery took place the patient remained unable to retain more than one ounce of urine at a time. In the same way I have observed that in some chronic abscesses of the prostate, where there had probably been considerable destruction of tissue, the power of retaining and holding urine was interfered with. The acuter forms of prostatic abscess, such for instance as those seen in connection with gonorrhoea, are chiefly confined to the ducts of the part, and are rarely followed by any permanent weakness. I have now the case of a young man under observation where by reason of the prostatic ring being riddled with tubercular deposit as far as the finger can reach, the power of holding urine is almost entirely lost.

I will illustrate in another way how the prostate may lose its power as a sphincter. The following case is, in my experience, almost unique, for though I have frequently suspected that certain symptoms connected with the act of micturition were due to varying degrees of the pathological condition of the prostate, presently to be described, I have never had another opportunity of demonstrating it to others.

R. W., aged 50, was admitted into the Royal Infirmary under my care on February 4th, 1889. Three years previously, after some excess in drinking, he had difficulty in passing his urine, which continued up to fifteen months ago, when, under medical advice, he had to resort to regular catheterism. He has since been unable to pass any urine without the use of the instrument. On admission it was found that he had to use a catheter three or four times during the day, and twice or thrice during the night. There was no stricture of the urethra, but a sense of resistance when the prostate was reached. Examination by the rectum showed the prostate to be natural in size, with some fulness about the right lobe. The urine was normal. The patient was carefully catheterised for several days, but as no improvement took place, I performed median perineal urethrotomy on February

19th. On introducing the finger the prostatic urethra was found in the condition of a hard fibrous ring, not unlike the constriction of a thick rubber band. This was also examined by Mr. Bickersteth, who assisted me, and it was agreed to divide it freely in a downward direction, and to put in a drainage tube. This was accordingly done; the drainage tube was retained for eight days, when it was removed, the urine escaping involuntarily by the perineal wound. The patient's condition gradually improved; he was able to dispense with the use of the catheter, and when he left the infirmary he was voiding urine naturally, with the exception of a small quantity, which escaped by the wound.

What the future of the case will be it is impossible to predict. However this may be, it in no way detracts from its value relative to the morbid condition the prostate may assume, both as regards function and structure. Here there could be no doubt that within the limits of the prostatic urethra there was such an obstacle to the voluntary discharge of urine as could only be removed by a surgical procedure.

The last case I shall bring forward is also one of much interest, not only in reference to the subject now under notice, but as bearing upon certain functional disorders of micturition from a somewhat different standpoint than has, so far as I know, been hitherto adduced. The case was brought to me for corroboration by Professor Barron, who has kindly permitted me to refer to it at length in connection with these remarks.

A well-nourished, healthy-looking boy, aged 4 years, was brought to me with the statement that he had suffered from birth with incontinence of urine, except at times when he was lying down. He had, in addition, suffered constantly from constipation of the bowels.

On examining the genital organs it was noted that circumcision had been performed, the portion of the prepuce that remained having a hypertrophied appearance. The penis, and particularly the glans, were deficiently developed. The scrotum and testes were natural in appearance and consistence. He was placed fully under chloroform, and a small metal sound passed into the bladder in order to facilitate the examination of the parts involved and their relations. The capacity of the bladder was small; it contained about a drachm of urine. On passing the finger into the rectum the line of the urethra was noted to be in much closer relation with the anterior wall of the rectum than is normal at this age. On examining the neck of the bladder nothing like the usual rudimentary prostate could be felt; there was a slight ridge on the left side which would correspond in position with the left prostatic lobe. The ridge did not extend to the right side, and, compared with other boys of the same age I have examined, did not represent the normal amount of prostatic development. Further, the relationship between the rectum and the neck of the bladder was far closer than what is usual in male children at this period of life. The thighs and adjacent parts had that excoriated appearance which is seen in cases of extroversion of the bladder. It was reported that the urine was normal. I concurred in the conclusion arrived at by Dr. Barron that there was evidence of arrested prostatic development, and that this probably explained the incontinence. Professor Gross gives the following measurements relative to the prostate at four years of age: "Breadth at base 6 lines; just above the middle, 7; and at the apex, $2\frac{1}{2}$; length along the middle, 6 lines, and 7 lines at the margin; thickness at base, $2\frac{1}{2}$ lines; at the middle, 4; and at apex, 2. Weight, 23 grains." The question naturally arises, What proportion of cases of incontinence in male children is due to an imperfect development of the retentive apparatus which must exist in the parts constituting the neck of the bladder? My belief is that by far the larger number of them are explainable by reflex causes, such as we are familiar with. I am not, however, at all sure that some may not be due to an arrested development in the prostate, such as I have illustrated. The muscular use of the prostate appears to me to be indicated in connection with the common operation of passing a bougie or a catheter along a urethra of natural calibre. The process is, as a rule, unattended with any other than the usual sensations of passing a foreign body along a mucous canal until the instrument enters the prostatic canal, when an irresistible desire to discharge urine is experienced; in fact, persons as a rule believe they are micturating, though a bougie only is used when this part of the canal is entered. This experiment may be easily tested either by measurement or with the finger in the bowel.

In a paper recently published by Mr. J. Griffiths³ on the minute

¹ *The Surgical Disorders of the Urinary Organs.* By Reginald Harrison. Third Edition, p. 346.

² *Trans. Prov. Med. Assoc.*, vol. iii (New Series).

³ *Journal of Anat. and Phys.*, April, 1889.

anatomy of the prostate, it is stated that its muscular power appears to have been exaggerated, and exception is taken to the conclusions drawn in reference to this point by Professor Viner Ellis.⁴ It seems difficult to reconcile Mr. Griffiths' views with such illustrations as I have ventured to draw from the practice of surgery bearing upon the function of this part.

NOTES OF A CASE OF WEIL'S DISEASE.¹

By SURGEON-MAJOR W. B. MILLER, Medical Staff.

PRIVATE J. N., aged 21, of two years' service, and belonging to the 2nd West Riding Regiment, when on parade on May 24th last, suddenly felt faint, and had at the same time a burning sensation all over him, with a feeling of exhaustion. On admission to hospital the temperature was found to be 103.6° F. He complained of slight headache, his face was dusky, the conjunctivæ were congested, he complained of a disagreeable taste in the mouth, his tongue was moist, indented, and covered with a dirty yellow fur. The heart sounds were faint, and respiration was slightly increased. He had no diarrhoea. The urine was dark coloured, in fair quantity, specific gravity 1022, and contained no albumen. He developed slight jaundice and congestion of the abdominal organs. Three days after he had a mucous expectoration of a dirty brown colour, while the lungs presented no physical signs to account for it. There was considerable gastric disturbance.

On May 28th he complained of pains in the calves of the legs. There was no œdema of the parts or swelling of the muscles. Gastric disturbance continued, and the first sound of the heart remained weak.

On May 29th there was a marked diminution of the slimy expectoration and the pains in the calves. There had been no eruption. The temperature gradually went down, and on the last day but one of the month the circulation had improved and the tongue was much cleaner. At night he had a sharp epistaxis, and while he had been heavy before it, he became much relieved and brighter. On the last day of the month there was an absence of fever.

On June 2nd both pulse and temperature were subnormal, as well as the respirations.

On June 4th these were normal, as also were the secretions and excretions.

On June 9th he was convalescent, and was allowed to be out of bed, and was discharged fit for duty on June 16th.

Diagnosis.—This might have been a case of non-specific continued fever from exposure to heat, or might have been supposed by some to have been enteric fever. It had not, however, the appearance of ardent fever, while its mode of commencement, with severe general symptoms, rapid pulse, and pains in the calves, the absence of diarrhoea, together with the other symptoms and the temperature chart, helped to distinguish it from enteric fever.

A word of caution regarding temperature charts may here be given. They are not so valuable as they formerly were as helps to diagnosis, as by antipyretics in general use the chart becomes more a guide as to the effect of these remedies than a clinical aid in detecting diseases.

This case was diagnosed as Weil's disease. Weil's disease, the cause of which is at present unknown, is said to attack the male sex at the prime of life, and develops usually during the hot season of the year. It was described by Dr. Weil in 1886, and was thought to be an abortive form of enteric fever; but Dr. Fiedler, who has given some attention to it, says that it is not so, but is a distinct, acute infectious, or toxic affection. The case under review presented the general characters, namely, fever which lasts eight or ten days, headache, gastric disturbance, jaundice, and muscular pains, especially in the calves of the legs.

Prognosis.—Had it been a case of enteric fever the prognosis would have been very guarded, as complications at any time might have arisen; but being a case of Weil's disease, the opinion formed was of a favourable nature.

Treatment.—The man was isolated on account of the infectious nature of the ailment. A purgative draught was given on May 25th. There was nothing of an unusual character in the stools. The temperature was reduced by sponging; quinine was afterwards given, and, later, iron. The diet at first was milk or milk and soda water; towards the end a little brandy was given, and he was put on solid food some days before his discharge from hospital.

HYSTERICAL CHOREA.¹

By P. BLAIKIE SMITH, M.D.,

Physician and Lecturer on Clinical Medicine at the Aberdeen Royal Infirmary.

THE case of hysterical chorea which I shall presently introduce to your notice is that of a woman, aged 22, who was admitted into the infirmary under my care on February 20th.

There is nothing important in her family history, but her personal record and the origin of her trouble are highly significant. She stated that about five years ago she acted for six months as nurse to a child the subject of St. Vitus's dance, and that three months ago another child, also affected with this complaint, resided near her house. Towards the end of last year she got a great fright by a dog suddenly running against her legs, and ever since then she has suffered much from nervousness; but she dates her convulsive trouble from four days before coming to the infirmary, when a violent pain temporarily seized her right foot, and coincident with this her "shakings" made their appearance. When I first saw her she was lying in bed with closed eyes and half-averted face. Her shoulders and arms were in constant movement. Each shoulder alternately was either violently raised or brought forward, and then suddenly lowered or retracted, while the arms, as they lay on the coverlet, were constantly being rotated inwards or energetically flexed. The movements of the shoulders seemed to have no relation to those of the arms, and both sets of movements were liable to sudden and unaccountable exacerbations. There were no spasms of the muscles of the neck, nor any contortions of the face. The tongue was protruding quietly, and remained out for inspection until the patient was told to withdraw it. Speech was unaffected. The grasp of both hands, notably the right, was much impaired. The superficial reflexes of the legs and trunk were greatly diminished, the knee-jerks much exaggerated and capable of being produced by tapping the rectus tendon on the front of either thigh. Rectus clonus, too, was present on both sides; ankle clonus was absent. The legs were free from spasm. The heart-sounds were normal, and its action regular.

A few days after admission it became evident that the spasmodic movements were performed with a certain amount of regularity; it was also noted that they ceased during sleep, that they were intensified by mental emotion, and that, however violent they were, they could occasionally be kept under control. For instance, the patient could feed herself without spilling her food; she could also knit, but, strange to say, she was quite unable to sew, and, though she could write, the agitation of her hand rendered it almost impossible to decipher what she had placed upon the paper.

When she walked, her body swayed from side to side, and her progress was erratic. She repeatedly knocked up against the furniture in the ward, and there were frequent sudden flexions of the body, now to this side, now to that, as she went along, while all the time her shoulders and arms continued in a state of active movement. Her mind was clear, and she was generally bright and cheerful, but occasionally she had fits of crying. For nearly three weeks there was little change in the symptoms just detailed. The movements persisted with varying intensity. The condition of the reflexes, too, was not constant; sometimes they were nearly normal, at other times they were in excess; hardly ever were they equal on the two sides. During this period the treatment consisted first in the administration of large doses of

⁴ *Med. Chir. Trans.* Vol. xxii.

¹ Read at a meeting of the Bermuda Branch of the British Medical Association.

¹ Read before the Aberdeen, Banff, and Kincardine Branch of the British Medical Association.