pain and irritability of the bladder, and in August, 1899, he was laid aside by a severe and persistent attack lasting thirteen days. I first saw him on October 10th, 1899. He usually saw blood every day or so, sometimes every time he made water, and was unable on this account, as well as from the pain, frequency of micturition, and straining, to satisfactorily carry on his usual occupation. I examined his bladder and removed many fine specimens of papilloma. The urine contained pus. He questioned me as to the advisability under the circumstances of another operation, and I suggested as an alternative that he should try the effect of nitrate of silver injections. I therefore taught him the method, commencing with $\frac{1}{2}$ gr. to 4 oz. of warm water, and increased the strength daily. He returned home in the course of a week carrying out the treatment.

January 25th, 1900. He reports "the best month since December 1896." He has injected regularly, using $\frac{1}{4}$ gr. of the silver nitrate. The blood has steadily decreased in frequency and amount, a period of a week often elapsing without any symptom, and then only a drop or two of pure blood coming at the end of micturition. The other bladder troubles had also become much less pronounced. During the early part of the treatment he had voided many fragments of tumour, exhibiting the usual changes.

September 25th. Two gr. of silver nitrate have been injected daily. No blood has been seen for a month and the other symptoms have quite subsided. The urine is not quite clear for it contains pus.

May 24th, 1901. The patient writes "I am surprisingly well." He has made no injection since the last report.

May 8th, 1902. He writes, "I think I should like you to know how well I am, certainly better than since 1892." He commenced to inject in February and intends continuing until June 1st.

October 26th, 1903. In February of this year he again resorted to the treatment, and has continued it with fair regularity until July 4th. He has "not noticed the slightest trace of blood or discoloration in the urine since June 13th," and he carries out all his engagements without trouble, walking three or four miles a day and is in good health.

CASE II.—C. J. B., aged 42. At the commencement of 1900 he first saw blood in considerable quantity. Again during the year in April, July, August, October, and November, and on two occasions the haemorrhage was so severe that it necessitated his lying up. He likewise complained of difficulty in commencing to micturate. I removed some fine specimens of papilloma.

On December 2nd, 1900, Dr. Dudley Buxton administered an anaesthetic, and I examined the bladder with the cystoscope, finding a diffuse papilloma covering a considerable area in the region of the trigone. The position and character of the growth being determined I decided, as I always intended when a suitable case presented itself, to pinch off as much as I could by means of a flat-bladed lithotrite introduced in the ordinary way through the urethra. This I did, while the bladder was distended with 8 oz. of fluid, and I afterwards washed it out thoroughly with an evacuating tube and bottle filled with a solution of silver nitrate $\frac{3}{4}$ gr. to the ounce. Much tumour debris was removed, sufficient, I should say, to form a growth the size of a small walnut. There was not much haemorrhage, but sufficient to obscure the view of the cystoscope and prevent its advantageous use during the operation. In future I intend to apply a solution of adrenalin, which, I think, will enable me to see exactly what is or has been done by the lithotrite. There was little or no haemorrhage after, and what there was ceased in forty-eight hours. He had retention, and had to be catheterized two or three times, but otherwise made a satisfactory recovery, and was in his usual health in less than ten days' time. Three days after the operation I commenced to teach him to inject himself with silver nitrate.

June 24th, 1901. He has continued to make daily injections, using $\frac{1}{4}$ gr. to the 4 oz., and has never seen any blood since he left the nursing home on December 17th. The difficulty of micturition has entirely subsided, and the urine is clear. He will make no more injections for the present. He is under the care of Dr. Duguid of Sheffield.

February, 1902. The first appearance of blood since the operation, more than a year ago, occurred to-day, but he has had no treatment since last June. His health has been good. I advised a course of injections.

October 5th, 1903. He writes that he continued the injecting till the end of June, 1902, and since then, now sixteen months ago, he has done nothing, nor has he seen any blood. He is able to work hard, and has no urinary inconvenience whatever.

CASE III.—J. A., aged 43, was sent to me by Dr. Smyth, of Brockley. The first symptoms of papilloma were noted in 1896, when he was taught to inject with silver nitrate. The treatment was carried out at first fairly regularly, but it was afterwards neglected. In June, 1902, he came to me complaining of frequency of micturition, constant haematuria, and a feeling of great distension in the lower part of the abdomen. He strained a good deal to void his urine, and could only pass a very small quantity at a time. A catheter introduced immediately after he had passed water withdrew 10 to 15 oz. of blood-stained urine. I endeavoured by regular catheterization and by injections to restore the natural function of the organ, but without avail, for not only was the bladder exceedingly difficult to empty with the instrument, but the manipulation certainly caused considerable increase in the haemorrhage. I therefore decided to perform a suprapubic cystotomy with the view of removing the obstruction and of thoroughly draining the bladder.

October 1st, 1902. Dr. Dudley Buxton administered the anaesthetic, and I opened the bladder in the usual manner. On examination with the finger and with an electric lamp I found, as I had anticipated, a sessile growth springing from the base of the bladder, which,

coming forward when an endeavour was made to pass urine, effectually blocked the outlet. I removed as much of the growth as I was able with safety, but was perfectly aware that I had not removed the whole on account of the extended area from which it sprang. The papillomatous debris I judged would have been sufficient to form a mass the size of a small egg, one or two of the larger tufts having a distinct, well-formed, fibrous base. Afterwards I drained the bladder, both by a tube in the suprapubic wound and by a catheter tied in the urethra. A good deal of haemorrhage followed, and I commenced to flush the bladder—a proceeding greatly facilitated by the two tubes—with a solution of silver nitrate, $\frac{1}{4}$ gr. to 4 oz. I continued the flushings twice a day, rather increasing the strength, and on the seventh day after the operation, as the bladder commenced to hold urine and the latter was clearing, I removed the suprapubic tube. The wound healed rather slowly but quite satisfactorily, and had entirely closed by the end of a month. The ordinary injections were resumed after the flushings ceased, and were continued throughout. At the end of the time mentioned he could hold his water three to four hours during the day, and would rise once or perhaps twice at night. The bladder had entirely regained its power, as I frequently proved by introducing a catheter directly after micturition, the urine itself being clear and bright and quite free from blood.

March 31st, 1903. He has continued the injections daily since he left the nursing home on November 5th. He empties his bladder by his own effort, frequently passes the night without rising, and holds his urine three and a-half hours during the day. He has seen slight traces of blood twice in December and once in February.

October 31st, 1903. He reports he has seen blood on ten occasions; the "haemorrhage has only been in the nature of more or less pinkish drops after a stream of urine." He holds his water four or five hours by day, and does not rise at night. He ceased to inject in April, but will commence again directly.

These cases, I think, demonstrate:

1. That recurrence of papilloma after removal by suprapubic cystotomy, which unfortunately very frequently occurs, may be effectually held in check by injections of silver nitrate.

2. That if injections are made, when it has been found impossible to remove the growth entirely by operation, the recurrence of the symptoms is retarded longer than could be expected without the treatment.

3. That much of a tumour may be removed by the urethra without serious haemorrhage, and a result gained equal in some cases to that of a suprapubic operation.

4. That there is reason to hope that papillomatous growths may be entirely destroyed by long-continued applications of silver nitrate.

The conclusions, therefore, which may be drawn, although confirmatory evidence is needed, are:

(a) That injections should be made after operations for the removal of the growth, whether the operator is satisfied that he has done so efficiently or not.

(b) That the urethral route should be tried, when removal of the papilloma is contemplated, before a more serious operation is undertaken.

The question whether most cases of papilloma should be operated on through the urethra before the injections are commenced, even when the diagnosis is made early and the tumour is small, or whether injections alone should be relied upon, requires further investigation. I should be inclined under favourable circumstances to give the former plan another trial; for, in the first place, the operation need not be severe nor attended with serious consequences, if strict attention is paid to sterility in instrumentation. In the second, the improved instruments recently made by Leiter and the advantages derived from adrenalin in stopping haemorrhage, render manipulation more certain; and thirdly, the size of the tumour to be attacked by the injection afterwards will be less even if only small portions are removed, and consequently the time required to check the disease shortened. In the female I have no doubt that this is the proper proceeding. Suprapubic cystotomy can hardly ever be wanted when access to the bladder is more easily gained through the urethra by the means of Kelly's tubes.

CASE OF EXTERNAL URETHROTOMY TREATED BY CONTINUOUS RETENTION OF A RUBBER CATHETER HELD IN POSITION BY A "PERINEAL STOP."

By C. HAMILTON WHITEFORD, M.R.C.S., L.R.C.P.,
Plymouth.

A PATIENT, aged 38, had a bad stricture of twelve years' standing, causing retention of urine. No catheter could be passed. I performed external urethrotomy, and kept a No. 12

Jaques rubber catheter in the urethra continuously for three weeks, by the end of which time the perineal incision had considerably closed. The occasional passage of a No. 20-24 Clutton steel sound completed the treatment. After operation recovery was uneventful. Rigors were entirely absent, and the presence of the catheter did not even cause discomfort. At the present time—that is, 2½ years after operation—the patient is well, and, as a precautionary measure, easily passes on himself a 20-24 steel sound once a month.

The accompanying diagram shows a Jaques rubber catheter fixed in the urethra from the perineum after Wheelhouse's external urethrotomy by what I have termed a "perineal

stop." (In the diagram the eye of the catheter should be in the bladder, and not, as represented, in the prostatic urethra.) It is used as follows: After external urethrotomy has been performed, and the urethra dilated to the size of a No. 12 or 14 silver catheter, a No. 12 Jaques rubber catheter is passed along the whole length of the urethra, if necessary by means of a stilette, the eye lying half an inch inside the bladder. The portion of catheter lying in the angle of the urethral incision nearest the pubes is drawn out by forceps through the perineal wound, and an incision one-twelfth of an inch made in the long axis of the catheter. Into this minute opening the "stop" is inserted, the long arm first and towards the bladder. The catheter is then drawn towards the meatus as far as the "stop" will allow, and a clip on the catheter close to the meatus completes the fixation.

If the presence of the point of the catheter in the bladder should cause irritation (although this has not occurred in my experience), the catheter may be fixed so that the point stops just short of the bladder, into which the catheter may be pushed by means of the "perineal stop" when it is desired to draw off the urine. When the perineal wound has partly closed, I use a "stop" with two short arms, which can be placed in position without drawing the loop of catheter through the perineal opening, and can therefore be employed until the urethral wound has nearly closed. To ensure that the eye of the catheter points away from the base of the bladder, it is convenient to cut a notch in the outer end of the catheter on the same side as the eye to act as an indicator. During the retention of the rubber catheter a certain amount of mucoid secretion appears between the catheter and the mucous membrane. This secretion is of no importance; it is not due to urethritis but is simply the secretion of the glands which normally open into the urethra. A metal catheter, tied in after external urethrotomy, frequently causes so much pain that it has to be withdrawn after a day or two. Urine then passes over the raw surface, and rigors not infrequently result. Later, an attempt is made to pass a metal instrument; this often causes bleeding and pain, which sometimes necessitates an anaesthetic for the successful introduction of the catheter, and when this has to be removed a day or two later rigors are again liable to occur.

The advantages of a rubber catheter securely fixed are:

1. The patient is free from pain, and can turn freely in bed without risk of the catheter slipping out.
2. The catheter can be retained continuously for several weeks, being removed every few days for cleansing; in fact until the perineal wound is nearly closed.
3. Retention of the catheter being continuous instead of intermittent, as is the case with a metal instrument, the wound heals round the catheter, and consequently the lumen of the strictured urethra is larger and requires less subsequent dilatation.
4. Rigors are avoided, since the urine does not come in contact with the raw surface.

5. The catheter, "stop," and clip are easily sterilized by boiling.

6. Tapes, plaster, rings, etc., are dispensed with.

The "stop" is made by Messrs. Reynolds and Branson of Leeds.

THE PATHOLOGY OF HALLUX RIGIDUS.

By J. M. COTTERILL, M.B., C.M., F.R.C.S. EDIN.,
Surgeon, Edinburgh Royal Infirmary.

Two communications have appeared in recent issues of the BRITISH MEDICAL JOURNAL on the above subject. In discussing the etiology of hallux rigidus Mr. Tubby says that he has come to the conclusion that "there is one cause underlying all the conditions—namely, an osteo-arthritic condition of the first metatarso-phalangeal joint." With regard to this opinion Mr. Ellis makes the pertinent remark that Mr. Tubby does not explain why this particular joint should be so affected.

It is of course abundantly evident to those of us who frequently operate on such cases that the joint is in a condition of chronic irritation, in which lipping of the bony edges, erosion of cartilage, and alterations in the synovial membrane are indicative of osteo-arthritis. But this statement of fact does not seem to take us in the least degree nearer to the solution of the question at issue—namely, why does this condition so frequently attack the metatarso-phalangeal joint of the great toe. Mr. Ellis comes to the rescue with the suggestion that all such cases (if I do not misunderstand him) are due to the hallux being packed under the second toe, as is found in a certain proportion of cases of hallux valgus.

Now, while this state of matters does occasionally account for stiffness about this joint, may I suggest that it by no means explains more than a comparatively small percentage of cases? and while many such patients are troubled by bunion, they do not in my experience consult the surgeon on account of stiffness and pain in walking due to ineffective efforts to dorsiflex the hallux on its metatarsal bone.

The condition of stiff great toe in adolescents, for which I suggested the name "hallux rigidus" in 1886, was discussed in a paper read before the Edinburgh Medico-Chirurgical Society in that year, and a short excerpt of the paper may be found in vol. vi of that Society's *Transactions*.

I then pointed out that while stiffness in this joint may doubtless sometimes arise from such causes as trauma, rheumatism, gout, ill-fitting boots, etc., in the large majority of cases it was primarily due to flat foot. In order for the condition of "hallux rigidus" to be produced, the flat-footed person must be in the habit of wearing boots which, as ordinary strong British boots are capable of doing, prevent the great toe rising to its normal angle of relation to its metatarsal bone, when the base of that bone falls into its abnormal position in flat foot.

Unless boots are worn hallux rigidus will not be caused. The big toe, instead of being extended straight out parallel to the ground, will turn up and thus retain its normal angle of about 150 degrees with its metatarsal bone. This is well seen in such negroes or children who are flat-footed, but who have never worn boots.

The stiffness is in many cases (as Mr. Tubby remarks) reflex in character, and is due to muscular spasm the result of joint irritation; in more advanced cases the ligamentous and other structures of the joint are altered in such a way as to cause permanent stiffness, which will not disappear under an anaesthetic.

This condition of hallux rigidus is in my experience very common in the out-patient department of a large hospital and in schoolboys. In early cases perfect cure can be attained by attention to the flat foot, and by passive movements and massage. In later cases excision of the head of the metatarsal bone is the best treatment. If, however, the patient object to operation, entire relief from pain can be obtained by following the suggestion made years ago by Professor Chiene to provide a stiff metal sole for the boot, which prevents any strain in the direction of extension being put on the painful joint in the act of walking; but this method, while quite successful as a palliative, perpetuates the stiffness and ungainly manner of walking.

THE new Belgrave Hospital for Children, Clapham Road, will be formally opened for the reception of patients by the Bishop of Rochester on Tuesday next.