intervals, ten to fourteen days before the expected date of confinement.

The sensitized vaccine is preferable to the ordinary vaccine because of the absence of reaction and the more rapid immunization.

Appended is a table showing particulars of the cases in this series treated to date. The inclusion of Cases 9, 10, 11, which were all severely ill on admission to hospital, has lowered the recovery-rate in the small series of cases available during the last year.

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TREATMENT OF A UTERINE ABSCESS BY SENSITIZED BACILLI PROTEI.

BY

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THE following case is of interest pathologically since a localized uterine abscess due to the *Bacillus proteus* is comparatively rare, and therapeutically on account of the excellent results which followed use of the double method of applying autogenous bacilli in treatment.

The patient was a married woman aged 55 who complained of a long-continued vaginal discharge of pus. Three years previously she had undergone subtotal hysterectomy for fibroma, an umbilical hernia being replaced at the same time. For six months subsequent to this operation the patient had trouble with her bladder, and then became subject to a vaginal discharge. This was found to be due to escape of pus from the cervix, and though active measures, such as dilatation of the cervix and its washing out and drainage, were long carried out in a hospital, the discharge never ceased.

On November 12th, 1913, the patient presented herself for treatment in Dr. Darier's service at the St. Louis Hospital, and on examination the vagina was found to be full of yellowish, thick, tenacious pus, without marked smell; it was seen to be exuding from the cervix, and a probe passed into the latter led into an abscess cavity a little under $1\frac{1}{2}$ in. in diameter. Some pus withdrawn from this cavity was submitted after microscopic examination to culture, and colonies of pure *B. proteus* resulted.

It was decided to treat the case by the double method described by me at the International Congress in London, 1913, and in order not to obscure the results, to prescribe nothing except prolonged daily vaginal douches. The first part of the treatment consisted in giving, at intervals of three or four days, seven injections of a culture of the bacilli derived from the pus; the doses gradually increased in amount, the first being equal to 100 million bacilli, and the last to 2,000 million. The bacilli were heated to 60° C. for an hour before administration. A very slight local and general reaction followed each injection.

On the eighth day after the last injection of these dead bacilli 20 c.cm. of blood was taken from the patient and used for the preparation of an autogenous vaccine consisting of living bacilli, sensitized by contact with the serum of the patient's blood, which was rich in amboceptor and specific agglutinating properties. At this date a vaginal examination was again made, and the abscess found to be still secreting, though in lessened quantity, pus containing the *B. proteus* in pure culture.

On the tenth day after the last injection of dead bacilli injection of the sensitized autogenous vaccine was commenced, one injection being given weekly for four weeks, and the dose increased from 400 million at the beginning to 1,000 million at the end. Again very slight reactions followed the injections. At the same time the abscess cavity was washed out with a dilute antiseptic solution.

By the time the fourth injection had been given the discharge of pus had entirely ceased, but to render the

cure more secure four further injections were subsequently given. At the date of writing six months have elapsed since the treatment was completed, and the surgeon who originally transferred the case to Dr. Darier's service as being intractable to surgical treatment has admitted it to be cured.

The result in this case falls into line with many other successful cases that I have seen since I first introduced this "double method" of using dead and then living and sensitized micro-organisms in treatment. It is based on the principle of sensitization devised by Professor Besredka, and is most convenient in practice.

EXCISION OF THE BLADDER FOR MALIGNANT DISEASE.

WITH RECORDS OF A CASE OF COMPLETE EXCISION
AND SOME CASES OF PARTIAL EXCISION.

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IN operating for the removal of tumours of the bladder, resection of the portion of the bladder wall which is infiltrated by a malignant growth, or complete removal of the bladder, is the only treatment (other than palliative measures) which can be adopted with advantage. Whenever, therefore, a surgeon makes a suprapubic examination of the bladder in cases in which a growth is seen with the cystoscope, or suspected to be present from the symptoms, he must be prepared to excise the portion of the bladder wall on which it is growing if it is infiltrating the wall. The following cases may, therefore, prove of interest to the general surgeon. I will first record them, and then make some remarks on the operative procedure.

CASE I.—Complete Excision of the Bladder for Extensive Epithelioma.

I was asked to see H. J. P., aged 59, early in November, 1913, in one of the medical wards of the General Hospital, where he had been for several weeks. He had been passing urine every hour night and day with much difficulty, and with pain either at the end of the penis or above the pubes. There had been a deposit of pus and blood in his urine, and usually an evening rise of temperature to 100°. He said that the first trouble he had with micturition was two years before I saw him, when he had had to have a catheter passed for retention, and that he had had retention several times since, and on one occasion since admission. The history pointed to enlarged prostate with cystitis. A No. 10 soft, bulbous-ended catheter passed easily, and withdrew one ounce. On rectal examination he seemed to have an enormous prostate. I could not reach behind it, but it felt smooth and not very hard. I decided to remove it, after the bladder had been washed out for a short time.

Exploratory Operation.

On March 14th, I opened the bladder above the pubes, and found almost the entire wall infiltrated by an ulcerating growth. Only a narrow strip of healthy bladder wall remained on the left lateral wall and the left side of the base. The cavity of the bladder was much reduced in size by the growth, which was of considerable thickness. It was evident that it was the malignant infiltration of its wall at the base which I had mistaken for an enlarged prostate. Clearly the only radical operation that could be done was complete excision. A large drainage tube was left in the bladder. The risk of complete excision was explained to the patient, and the need for a preliminary operation to establish urinary fistulae, and he wished that the excision should be undertaken.

Ureterostomy.

The bladder was kept empty by means of Cathcart's apparatus and washed out daily, and pyrexia ceased. On March 28th I brought both ureters out on the loin and fixed them to the skin. I made the usual loin incision to reach the kidney, and divided the ureters as low down as I could; I tied the distal ends with catgut and brought the proximal ends out on to the loin. Into the divided end of each ureter I passed a No. 1 bulbous-ended catheter, and tied the end of the ureter on to the

catheter as the colon is tied on to a Paul's tube. The end of the ureter, with the catheter tied in it, was then sewn to the angle of the skin wound and the wound closed by deep catgut and skin stitches. On the right side I found the kidney hydronephrotic and the ureter greatly dilated. On the left side both kidney and ureter were normal. There was no shock after the bilateral operations. The urine was conveyed from each ureter by a rubber tube, fixed on the end of the catheter tied in the ureter, to a bottle for some days after the operation, so that no leakage of urine occurred into the dressing. The wounds healed satisfactorily.

For some time after the ureterostomy there was only occasionally secretion of a little watery urine from the right kidney, but after a time it was discharged freely. The left kidney secreted healthy urine in considerable quantity from the time of the operation. The condition of the bladder remained very foul in spite of washing out and the introduction of boroglyceride, but he had very little pyrexia, took his food well, and seemed comfortable.

Excision of the Bladder

On April 15th I operated for removal of the bladder. The bladder was packed with iodoform gauze through the suprapubic drainage tube opening, and pure carbolic acid was applied to the granulations around the opening. The skin of the abdomen was then cleaned, and lint soaked in 1 in 20 carbolic applied to it while the perineal part of the operation was performed. The patient was placed in the lithotomy position and a curved incision made with its centre at the central part of the perineum. This incision was deepened until I could get my finger between the prostate and the rectum, and I separated them. He was then placed in the Trendelenburg position, and an incision was made around the opening in the bladder through the skin and surrounding rectus muscle, and the separated skin edges were then sewn together, so as to cover over the bladder opening and exclude the cavity of the septic bladder from the area of the operation. The abdomen was then opened by carrying the incision upwards in the middle line to 1 in. above the umbilicus. No enlarged glands were discovered nor any secondary growth elsewhere in the abdomen.

The bladder, infiltrated by growth, formed a large hard mass which was almost fixed to the pelvic wall in front and at the sides, but just the slightest amount of movement could be obtained. A large boss of growth protruded from the posterior wall of the bladder, and the peritoneum covering it was puckered. The pelvic colon passing down behind the bladder was so distended that it was a good deal in the way, but there did not seem to be any mechanical obstruction. All the small intestines were, of course, packed away in the upper abdomen. The bladder seemed so fixed to the symphysis that I first tried separation there, and as I succeeded, I proceeded to divide the peritoneum covering the posterior surface about half an inch from its reflection on the bladder, and left it on its posterior surface. A section of the bladder wall after its removal showed that this was essential, as the growth had extended to it, though it had not involved its abdominal surface. I then tied off many strands of tissue passing between the bladder and the pelvic wall, just as is done in separating the rectum in the abdomino-pelvic operation of excision, but there was very little room to work in, the infiltrated bladder was so close to the pelvic wall. I was able to drag down the lower portions of the ureters, after separating the tissue along their course with my finger, but it was not easy. Probably adhesion had formed at the divided upper end. I divided the urethra by extra long scissors slightly curved on the flat. After all the other connexions of the bladder had been divided it was still tethered by a very thick strand of tissue passing on each side of the rectum to the lateral wall of the pelvis. These were clamped with curved forceps and divided.

The whole area from which the bladder had been excised was packed with iodoform gauze before the patient was lowered from the Trendelenburg position; the temporary abdominal packing was removed and the intestines thus allowed to return to the pelvis. The gap in the peritoneum was much too large to close by sutures, but when the upper three-quarters of the abdominal incision had been closed the gap was considerably reduced in size, so that the distended pelvic colon almost covered the whole of it. Through the gap the mass of the iodoform gauze packing came in contact with the pelvic colon and a small area of small intestine. A drainage tube was placed in the perineal wound. There was not much haemorrhage during the operation as all strands of tissue passing to the bladder were

clamped before division; his pulse was 120 and fairly strong at the end.

Description of Parts Removed.

Examination of the excised bladder showed that only a strip of the wall about an inch wide on the left side was free from growth. All the rest of the bladder wall was occupied by firm white growth, which in some parts was an inch thick. Microscopic sections showed the growth to be epithelioma. The surface was very sloughy. Two enlarged glands were removed with the bladder from the pelvic wall, but these on microscopic examination did not show any growth.

After-History.

No serious symptoms followed the operation. The gauze packing was removed on the fifth day and a drainage tube put in. Suppuration occurred in the space from which the gauze was removed, and discharge continued both from the suprapubic and perineal drainage tubes. He was confined to bed for five weeks after the operation, but kept free from any marked degree of pyrexia. Rubber bags with pneumatic rings were made to collect the urine from the opening of each ureter, and the urine was conveyed from these by rubber tubes to a rubber receptacle suspended on him beneath his clothing. With this apparatus in use he insisted on returning home on June 9th, but there was still a purulent discharge from the perineal opening, through a drainage tube which passed right through from the suprapubic sinus to the perineal one. I did not see him again until December 1st. There was then still a purulent discharge from behind the pubes, but there was no sign of recurrence of growth on examination in the hypogastrium or by the rectum. His condition seemed fairly good, and he was tolerably comfortable. He came into the hospital for a few days and had a new belt made to keep the bags with pneumatic rings against the openings of the ureters, and to support the scars. A few days after he returned home melaena came on, and although a medical practitioner was called in, it could not be checked, and very quickly proved fatal.

CASE II.—Resection of Part of the Bladder through the Peritoneal Cavity for Epithelioma.

J. S., aged 50, was sent to me in April, 1912, by Dr. Cotton, with a history that for two months he had had pain at the end of the penis with micturition and the passage of "spots" of blood with the urine. At first these symptoms occurred every few days only, but by the time I saw him they accompanied each act of micturition. The urine came clear at first, and then at the end of micturition some blood dropped away. Only on two occasions had the urine been coloured by blood throughout the whole act of micturition—once on March 5th and once on the day I saw him (April 5th). He passed urine about every three-quarters of an hour by day, and three or four times at night. I saw the urine he had passed before he came to see me that morning, and it contained a considerable quantity of blood, but urine passed before me did not contain any. No pus or crystals were present with the blood in the earlier specimen. He had no difficulty in passing urine, but had pain at the end of the penis as he finished.

Condition on Admission.

He was admitted to the General Hospital on April 17th. Up to the time of admission he continued to pass a little blood at the end of micturition, but a specimen I examined after admission was quite clear and free from blood. He passed at times little fragments of white tissue, about the size of pin heads. These, when examined with a magnifying glass, did not look like portions of papilloma, but when stained and examined under the microscope were seen to contain epithelial cells. On the 19th I endeavoured to get a view of the bladder with the cystoscope. It gave him so much pain that I made another attempt under spinal anaesthesia, but the fluid injected into the bladder was so tinted with blood that I could not get a satisfactory view. A rectal examination showed the prostate to be slightly enlarged, but there was no evidence of infiltration at the base of the bladder. The symptoms and the passage of minute fragments of tissue suggested the presence of vesical growth.

Operation.

On April 23rd I opened the bladder by suprapubic incision, and found a growth the size of a five-shilling piece attached to the junction of the posterior surface and the base just behind the trigone. It was not villous,

but firm with an ulcerated surface, and it evidently involved some depth of the bladder wall. In order to define its exact relation to the ureters, I passed ureteral catheters into each, and I then found that I could excise the portion of the bladder wall on which the tumour was growing with a small margin of healthy bladder wall without injuring them. As it was impossible to tell whether the peritoneum was involved by the growth, or, if not actually involved, was too close to it to be left, I decided to open the peritoneal cavity and remove the whole thickness of the bladder wall. I therefore placed the patient in the Trendelenburg position, and the intestines lying in the pelvis were packed up into the upper abdomen, so as to well expose the peritoneal aspect of the bladder. I then carried the suprapubic incision into the bladder vertically down the posterior aspect, until I was an inch from the growth, and then carried it through the bladder wall round the growth and at the same distance from it, except below it, and there I was unable to allow quite an inch margin of healthy tissue, because of the proximity of the ureters, as shown by means of the ureteral catheters lying in them. During the division of the wall numerous vessels had to be clamped, but in dealing with a growth in the position which this one occupied in the bladder, there was no difficulty in dealing with the haemorrhage. At this stage of the operation the urine was draining away from the kidneys through the ureteral catheters, and none was entering the bladder. A large circular gap was of course left in the posterior wall of the bladder, after the excision of the growth, and this I closed by bringing the edges together with No. 1 40-day catgut, the stitches taking up the whole thickness of the bladder wall. The ureteral catheters were then brought out through the urethra, and the bladder packed with iodoform gauze, which was brought out through the suprapubic opening. A row of sutures were then put in to close as much of the peritoneum as could be brought together from the abdominal aspect; only a gap at the base could not be thus united. After the removal of the temporary abdominal packing some iodoform gauze was packed against the abdominal aspect of the bladder, and the end brought out of the elsewhere sutured abdominal incision. Of course, several changes of gloves and sterilization of instruments were required during the operation. His pulse was only 80 at the end, and of good strength.

Description of Growth.

The growth was an epithelioma deeply invading the muscular tissue, but not extending to the peritoneum.

After-History.

The gauze packing was removed from the peritoneal cavity and the bladder on the following day, and a drainage tube was inserted into the peritoneal cavity, so as to lie just against the sutured bladder wall. The urine drained away by the ureteral catheters, which were retained for six days after the operation, and then the urine was drawn away from the bladder through the suprapubic opening by Cathcart's apparatus. No serious symptoms followed the operation. Sixteen days after the operation the suprapubic drainage tube was removed, and he began to pass a little urine through the urethra, and ten days later all the urine was coming that way. The suprapubic wound had healed enough for him to go to the convalescent home early in June, and by the 10th it had closed. I saw him on July 10th. He was then able to hold his urine for an hour and a half, he had no pain with micturition, his urine was clear, and the scar sound.

Dr. Cotton tells me that now (1914), two years after operation, he is quite well and in active work, and has had no recurrence of his former symptoms.

CASE III.—*Partial Excision of Bladder for Malignant Growth.*

G. H., aged 56, was admitted into my ward at the General Hospital on August 14th, 1909, with a history that two months before admission he had passed a small clot at the end of micturition, and continued to pass them until six days before admission, when he began to pass blood-stained urine, and he had continued to do so up to the time of admission. He had also had pain in the suprapubic region, extending to the root of the penis, after micturition at times, but the first symptom was the passing of a small piece of clot two months before admission. He had no difficulty in micturition. I saw him pass urine containing a good deal of bright red blood, which was present throughout the whole act. On standing there was a deposit of pus, as well as blood.

On August 17th I tried to pass the cystoscope, but even after attempting to dilate the urethra with Lister's sound, I could not pass the instrument through the anterior urethra, though a No. 8 catheter passed easily. The prostate felt normal, but on pressing down above the pubes a swelling could be made out in what would be the position of an enlarged (so-called) middle prostatic lobe.

Operation.

On August 20th I opened the bladder by the usual suprapubic incision and found a hard round tumour the size of a small hen's egg, with the appearance of old blood clot, growing from the bladder wall just above the urethra. Close to it, on each side, was a firm nodule of growth $\frac{1}{2}$ in. in diameter. There were also two papillomata on the bladder wall, one on the left of the large tumour and the other at the base posterior to the trigone. The one at the base, which was about $\frac{1}{2}$ in. by $\frac{1}{4}$ in. in size, I dissected away with the mucous membrane on which it was growing; the one just to the left of the larger growth I removed on the portion of bladder removed with the larger growth, together with the two minute nodules of growth. In order to resect the bladder wall I carried the incision already made downwards, behind the pubes to half an inch of the growth, and then carried it at this distance from the growth around it. This was a very difficult proceeding in this position; the neck of the bladder was so fixed by the attachment of the urethra under the pubes that it was impossible to get a good view of the parts, so that I had to be guided by touch more than sight, which was, of course, unsatisfactory. The haemorrhage was exceedingly free, and it was most difficult to catch the vessels, so that I had to rely a good deal on sponge pressure. I did not injure either ureter, but cut very near one. The excised portion of bladder contained the roof, but not the floor of the prostatic urethra, and therefore a small part of the prostate. In order to get better access to the region of the bladder growth, in addition to the vertical incision between the recti, I carried an extension of it transversely outwards through the left rectus. I found it impossible to reconstruct the bladder. The attempt to bring the wall together puckered up the base so much as to dangerously interfere with the ureters. I therefore packed the space behind the pubes with iodoform gauze, and put a large drainage tube into the bladder.

He lost so much blood owing to the difficulty in dealing with the bleeding vessels in the bladder wall just behind the pubes that it was necessary to resort to saline infusion at the end of the operation, and several pints were also given by the rectum during the night after the operation.

Description of Growth.

The growth was $1\frac{1}{2}$ by $1\frac{1}{2}$ in., and was firm and white. The surface after removal presented the same appearance of old clot as it did when in the bladder. Microscopic sections showed it to be a glandular carcinoma, not an epithelioma.

After-History.

He had no serious symptoms after the operation. Cathcart's apparatus was begun the day after the operation, and the gauze packing was removed on the fifth day. I was not myself able to see him again until January, 1910, as I was unable to attend the hospital during that time; but the edges of the suprapubic opening were pared and brought together by the house-surgeon after the removal of the drainage tube. Urine, however, continued to leak from the opening almost up to the time I saw him in January, 1910. There was then no leakage, and he passed his urine without pain or difficulty, almost every hour, but the urine was not quite clear. A hernia had formed through the lower end of the rectus, where it had been transversely divided. In March he had some pain with micturition and pus in his urine, and was readmitted and his bladder washed out. His condition improved, and he was discharged at the end of the month, and when seen again early in April he was free from pain with micturition, but still had a little pus in his urine.

He came to see me again in November, and said he had had recurrence of pain with micturition at times since April, and lately had passed some blood with his urine. He was readmitted for examination, but I found I could not pass a cystoscope into his bladder. His condition again improved with washing out the bladder, but only for a time. He declined any further operation, and I have unfortunately not been able to communicate with him since that time.

CASE IV.—*Partial Resection of the Bladder for Malignant Growth.*

H. J., aged 65, came under my care in the General Hospital in October, 1904, with a history of three months' haematuria. Blood had been present in his urine almost daily and often several times a day. There was also pain at the end of the penis with micturition, and later on it was felt also in the perineum. The haematuria prevented any attempt at cystoscopic examination.

Operation.

On October 12th I opened the bladder by suprapubic incision and found a growth the size of a small orange projecting from the posterior wall near the base. Its attachment to the base was of much smaller extent than its greater diameter, but it could hardly be called pedunculated. It was soft, very friable, and mixed with clot. By making traction on the tumour it could be drawn out through the suprapubic incision into the bladder, inverting the posterior wall, on which it was growing, with it. There seemed to be no induration of the bladder wall at its base, and I was hopeful that I could dissect it off the wall; but, in attempting this, I found it infiltrated the wall, and that I must resect a portion of the wall with it. I was able to do this without opening the peritoneal cavity. The growth was so near the base that some loose fatty tissue lay on the outer aspect of the bladder wall where I resected it. A gap was left in the bladder wall almost the size of an egg-cup, the edges of which were united with catgut so as to completely close it, and the suprapubic wound was also united around a large drainage tube, and after the operation the urine was drawn off by Cathcart's apparatus. The growth was infiltrating the muscle wall, but I have unfortunately no report of its microscopical character.

After-History.

The operation did not cause any marked shock, and he had no serious symptoms after it, and was discharged on November 13th. Almost all the urine was then coming by the urethra, and he had no pain with micturition or haematuria, but in January he had a return of the haematuria, and I found there was recurrence of the growth, but I have no further record of him.

For some cases of very extensive malignant disease of the bladder, such as in Case I, in which complete cystectomy was performed, this operation is the only thing that can be done for the patient. Statistics show that the risk is very great, and the tendency to recurrence of the disease also considerable, so that the experience of the operation up to the present time is not encouraging, but this has been so when extensive operations have first been undertaken for malignant disease elsewhere, and yet after further experience the operative results have much improved. Probably the mortality of complete cystectomy will be reduced if a preliminary operation is performed to establish a bilateral urinary fistula. If a partial resection of bladder wall can be carried out for the removal of a malignant tumour growing on it, and a fairly wide margin of healthy tissue can be removed with the growth, I do not think the organ should be completely removed—though I know that some surgeons have recommended that this should be done—but it seems to be a question whether, if the growth involves both ureters, it would not be better to perform complete cystectomy than partial resection with implantation of the cut ends of both ureters into the bladder wall, though, no doubt, implantation of the cut end of one ureter should be undertaken after partial resection of the wall. But, from the experience which I have had with Case III, I feel sure that if the growth is situated in the region of the trigone or above, but close to the urethra, it would be better to do a complete cystectomy, for it is most difficult to get sufficiently good access to this part of the bladder either to be certain where to cut so as to be well free of the growth, or to deal with the haemorrhage from the cut wall. The reason of this is that this part of the wall is so tethered under the pubes by the attachment of the urethra.

Last year Mr. Russell Howard described⁸ a method of excising a cancerous prostate from a suprapubic incision by dividing the urethra and then dragging the prostatic region of the bladder into a region of good access before removing it. Probably in this way malignant growths in the bladder wall in the region of the urethra could also be removed and complete cystectomy avoided. If I performed this operation I should be inclined to make a

preliminary separation of the prostate and rectum through a perineal incision, so as to get the rectum well out of the way before dividing the urethra behind the pubes. In my own case the operation of complete cystectomy was particularly difficult, because the growth was so extensive that the bladder had become very much bound down to the surrounding tissues, but in a case of less extensive growth the operation should not present any serious difficulty. Even with such an extensive growth, rendering the operation exceptionally difficult, there was no serious haemorrhage or shock.

The question how to deal with the ureters requires very careful consideration in the male. In the female it is obviously best to implant them in the vagina, and this can be done with advantage as a preliminary operation to the cystectomy. Implantation into the colon seemed to me to involve too great risk of ascending infection.

In operating in my case I followed the suggestion made by Dr. Francis Watson of Boston some few years ago,² and made a urinary fistula on the skin of the loin on each side as a preliminary operation, but I did not adopt quite the same method as Dr. Watson, who ties the upper end of the ureter and establishes a fistulous track between the kidney itself and the loin. Such a track, lined by scar tissue, would, it seems to me, be liable to contract, although many patients have passed urine through such for a considerable number of years. I therefore divided the ureter as low down as I could, and brought the upper end out on to the loin and fixed it to the skin there. I do not see that there is greater liability of infection spreading to the kidney than along a track lined by scar tissue. It was certainly an advantage to draw off all the urine from the ureter, as we do the intestinal contents with a Paul's tube in colotomy, and thus secure a dry wound for at any rate some days, but in order to make a tight, non-leaking junction of the catheter and the ureter, it seemed necessary to tie the end of the ureter on the catheter, and thus to cause a small slough at the end of the ureter, and this may be a source of ascending infection to the kidney. I think it would be an advantage, in operating by the method which I employed in order to establish a urinary fistula, to wrap the lower end of the divided ureter in Cargile membrane, so as to prevent the adhesion of the end of the ureter to the surrounding tissues, which makes it difficult to drag down what is left of the ureter when performing the cystectomy. If we simply tied and divided the ureter close down to the bladder and left the tube between this point and its higher ligature and division, it seems possible that trouble might arise from secretion from the mucous membrane in the occluded portion of the ureter.

In performing complete cystectomy I think it is a great advantage to make a separation between the prostate and the rectum from the perineum before undertaking the abdominal part of the operation, for in division of the urethra behind the pubes where the parts are not within easy reach, it is a satisfaction to know that you cannot, by cutting too deeply, wound the rectum. An extra long pair of scissors, slightly curved on the flat, are a great assistance in making the division of the urethra, and it would be well to clamp it on the vesical side before making the division, so as to prevent leakage from the bladder when it is cut across, for though urine will not be entering the bladder from the kidneys because of the preliminary diversion of it on to the loin, yet with an ulcerating growth in the bladder any fluid escaping from the cut urethra would be septic. Even if the bladder is opened by suprapubic incision to examine the condition of the growth, as is likely to be the case, by packing the bladder with gauze and sewing it up and taking the precaution to clamp the urethra before division, the excision of the bladder can be undertaken with an aseptic wound. Precautions must of course be taken as to the change of gloves, and re-sterilizing of instruments between the closure of the suprapubic opening and the later stages of excision of the bladder.

If the growth does not involve the posterior wall of the bladder it would be well to peel off the peritoneum, and do the excision as an extraperitoneal operation, and this would, of course, diminish the risk, but the peritoneum corresponding to the area of a growth on the posterior wall (indeed, somewhat larger than the area) should be removed with it, for it would not be wise to leave any part of the thickness of the bladder wall on which a malignant

tumour was growing. If the bladder is packed with gauze and sewn up, the risk of infecting the peritoneal cavity is less than in partial resection when we have also to remove the peritoneum covering the posterior wall, for then we have to work with an open bladder. But in either case, if the small intestines are allowed to gravitate to the upper abdomen in the Trendelenburg position, and the pelvis is well packed with gauze so as to form a secure barrier on the abdominal aspect of the bladder, the risk of peritoneal infection cannot be very great, especially if the urine is flowing directly out of the ureters through ureteral catheters during the operation in the case of partial resection. I think the peritoneum should as far as possible be united in either complete or partial cystectomy from the abdominal aspect, in partial cystectomy as a separate layer after the rest of the bladder wall has been sewn together from the vesical aspect. I believe it is wise also to drain the peritoneal cavity by a split drainage tube with a wick laid against the sutured peritoneum and brought out of the abdominal wound at a separate gap higher up than the vesical drainage opening in the elsewhere closed incision, in cases in which such a peritoneal drainage tube is employed after partial resection of the posterior wall. If Cathcart's apparatus is employed all the urine from the bladder will be drained away from the wound, and there will be no risk of urine gravitating into the peritoneal cavity through the drainage tube. Indeed, if for any reason Cathcart's apparatus failed to work, if the patient were kept in the Fowler position after the operation, there would be little risk of this. But the safest plan seems to be direct drainage from the ureters out through the urethra, so that no urine collects in the bladder for a few days after the operation.

REFERENCES.

¹ Watson, *Annals of Surgery*, 1905, vol. xlii. ²Ibid. ³*Lancet*, 1913, ii, p. 1690.

A CASE OF ECTÓPIA VESICAE IN WHICH THE URETERS WERE GRAFTED SUCCESSFULLY INTO THE RECTUM.

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THE subject of this report was a girl, aged 8 years, who was sent to me by her medical attendant to ascertain if anything could be done to improve her condition.

I found that she had ectopia vesicae, and was in a pitiable condition. Urine was continually spurting in drops from the two ureteric openings, calcareous concretions had formed on the pubic hairs, she was unable to walk except for a short distance, and had to be wheeled about. Her clothing adhered to the protruding posterior bladder wall, causing pain and discomfort by rubbing on it and the concretions; slight haemorrhage also occurred at times. There was a urinous odour about her, and she was unable to attend school; she was fretful and irritable; the posterior bladder wall bulged like a large ventral hernia, and contained coils of intestine; the pubic symphysis was absent.

I decided to transplant the ureters into the rectum, and on October 7th, 1912, under a general anaesthetic, I dissected up the posterior bladder wall from the peritoneum above and triangular ligament below. A catheter was inserted into each ureter, which was cleared for about 2 in.; the redundant portion of the bladder was removed except just around the ureters. I next divided some fibrous tissue in the position of the hymen admitting the finger into the vagina, and then divided the triangular ligament, permitting the lower end of the ureters to be turned back into the vagina in close proximity to the anterior rectal wall. With a finger in the rectum an opening was made through the posterior vaginal and anterior rectal walls, and through this the catheters and ureters were placed; the free edges of the recto-vaginal incision were sutured to the sides of the ureters, the triangular ligament, perineum, and abdominal wounds were respectively drawn together with catgut. Urine was collected in a receptacle for seven days from the two catheters which protruded from the anus; they were

then withdrawn, and the patient made an uninterrupted recovery.

She is now able to run about, attend school, and retain her urine in the rectum for several hours at a time.

ON A DIRECT INTRAGASTRIC METHOD OF TREATING CERTAIN ULCERS OF THE STOMACH

BY REMOVAL "PAR MORCELLEMENT" OF UNHEALTHY TISSUES, AND MOBILIZING HEALTHY GASTRIC MUCOUS MEMBRANE.

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IN May, 1910, whilst operating upon a case of gastric ulcer in a young woman aged 25, I was confronted by conditions for the treatment of which, in my opinion, there did not exist any sound or recognized method of surgical procedure.

The conditions which did not lend themselves to the ordinary treatment by excision or gastro-enterostomy were the following:

1. The anterior wall of the stomach, pylorus, and duodenum appeared normal.

2. The peritoneum of the posterior wall of the stomach had participated in an inflammatory attack or attacks, which had terminated in the complete obliteration of the lesser peritoneal sac.

3. After performing the usual exploratory anterior gastrotomy, I found a solitary chronic ulcer of the size of half a crown situated about the middle of the posterior wall of the fundus ventriculi. The unhealthy base of the ulcer was firmly fixed, probably to the pancreas, and it also transmitted the pulsation of the aorta.

The operation I performed was as follows:

1. Scraping radially from the centre of ulcer by Volckmann's spoon all the detachable unhealthy tissues as far as the under surface of the mucous membrane forming its edge.

2. Thermo-cauterization of the exposed fresh base of the ulcer in order to stop haemorrhage completely and to sterilize.

3. Mobilization of the mucous membrane all round the edge of the ulcer by means of a long blunt-pointed scissors curved on the flat and with a delicate end, much after the fashion of Charles Mayo in dissections of the neck.

4. Removal *par morcellement* by means of Arbutnot Lane's bone-nibbling forceps of all the unhealthy mucous membrane now forming the mobile edge of the ulcer. I waited until oozing completely stopped.

5. The edges of the healthy mucous membrane were brought together by means of suitable sutures—continuous or interrupted.

6. The gastrotomy wound was closed by separate continuous suture for the mucous, muscular, and serous layers.

7. The abdominal wall was then closed. The first patient upon whom I carried out the above method of treatment has been under my personal supervision ever since, and the result is a complete success.

I have performed similar operations since upon cases such as ulcer of the lesser curvature at the junction of the vertical and horizontal portions of the stomach with equally good results.

In one other case of gastric or peptic ulcer developing symptoms after the performance of a posterior no-loop gastro-enterostomy, I carried out successfully the direct intragastric treatment by operation through the jejunal loop of the old anastomosis. The performance of this operation was simplified by the circumstance that I had made a large opening between the stomach and jejunum as advocated by Moynihan.

I have not, so far, performed a similar operation for ulcers in the pyloric portion of the stomach, nor for duodenal ulcers. The much-folded mucous membrane of the stomach lends itself to the mobilizing of its affected area, and it seems to me to be quite unnecessary to excise the whole thickness of the stomach—a more risky undertaking than to carry out the method recorded in this paper.