

to wait until 1878 when a Boston surgeon, named Bigelow, developed the modern lithotrite. His instrument is used to this day and is most successful. He also invented an evacuator by means of which the various crushed fragments could be removed. The mortality of the operation in the hands of Bigelow was reduced from 30 per cent. to 2.4 per cent. Bigelow, of course, had the great advantage of ether anaesthesia.

The kidney was never operated on for stone. Sometimes, when a perinephric abscess formed, a stone might be evacuated into the abscess cavity and so through the wound, but there were no set operations on the kidney at all. A surgeon named Hevin stated that the kidney should only be opened by a surgeon who was both God fearing and honest. This piece of advice, I think, should hold good for all time. The father of English kidney surgery was Sir Henry Morris, who performed the first set operation for kidney stone in 1880. It was the development of the cystoscope by Nitze which began the era of scientific kidney surgery. Before Nitze was able to perfect the instrument to see into the bladder surgeons had to use a funnel-shaped tube with a head mirror and reflected light from a candle. Nitze introduced an incandescent platinum loop, which he fixed to the end of the cystoscope, but, owing to the fact that the loop was naked, many burns of the bladder wall resulted. It was the production in America by Edison of the incandescent lamp which made cystoscopy, as we know it to-day, possible. To the ordinary cystoscope was soon added a mechanism which enabled the surgeons to pass catheters into the kidneys for taking specimens of urine. By means of the cystoscope we are able to get a perfect view of the inside of the bladder and diagnose pathological conditions in its wall. The ureteric orifice can also be studied and kidney function tested by the introduction of dyes into the body and timing their appearance through the ureteric orifices in the bladder. Another development of the cystoscope has been the operating cystoscope. This instrument has a continuous stream of water flowing through it which keeps the medium of the bladder perfectly clear. It is possible to operate on large tumours of the bladder, to remove stones from the lower end of the ureter and to perform other delicate manoeuvres that otherwise could not be done except through an open operation. A recent evolution of the cystoscope has been the cystoscopic lithotrite which combines in one instrument a cystoscope and a lithotrite and enables the surgeon to crush the bladder stone under direct vision, so avoiding the blind operation which frequently, even in the hands of the very skilled, produces damage to the bladder wall.

The next most important step in urological surgery was the discovery in 1895 of X-rays. This discovery made the diagnosis of urinary calculi certain. The first case of stone in the kidney ever to be seen on an X-ray film was a case of McIntyre's of Glasgow in 1896. X-rays have also helped us to diagnose other conditions besides stone, such conditions as hydronephrosis, renal tumours and renal abnormalities can be detected. A ureteric catheter is passed into the kidney and the pelvis of the kidney dilated by a substance, such as sodium iodide, which is opaque to X-rays. A perfect photograph of pelvic outline is so obtained and any distortion of the contour is noticed and various deductions made.

In 1930 a further advance was made by the introduction of a substance called uroselectan by a German surgeon called von Lichtenberg. Uroselectan is a substance which contains 42 per cent. of iodine and 20 c.c.'s of this substance is injected intravenously, and in about 15 minutes this is secreted by the kidney. During the process of secretion photographs of the kidney, ureter and bladder are taken. The degree of rapidity of the secretion

and its intensity are used as measures of the kidney function. Many renal conditions are diagnosed by this substance. It is particularly useful in the case of injury to a kidney. One is informed by the photograph how severely damaged the kidney is and, a very important point, one is able to tell immediately if an operation for the removal of the damaged kidney appears to be necessary, whether the uninjured kidney is sufficient to carry on the work of both kidneys. It is obvious also that it indicates the absence of, or the complete loss of function of, one kidney.

I now come to the surgery of the prostate. The medical profession were in complete ignorance of the true nature of prostatic obstruction until 1900. It is true that an Army Medical Corps surgeon, named Guthrie, recognised retention of urine as being due to an obstruction at the neck of the bladder. He was a surgeon with Wellington in the Peninsular War and he had a special instrument containing a concealed knife which he passed into the bladder. As soon as the obstruction was met the knife was released and the obstruction divided. The first suprapubic prostatectomy was performed in Leeds in 1882 by McGill, but it was not until the time of Freyer in 1897 that suprapubic prostatectomy got a great impetus. Freyer's mortality was 5 per cent. whereas in the hands of many other surgeons it was as great as 20 per cent. The high mortality of prostatectomy is in great measure due to the fact that this type of patient is a bad surgical risk. He is usually a man over 65 with a damaged heart and lungs whose span of life even without the embarrassment of an enlarged prostate would hardly be more than five to ten years. Many of these patients suffer from mental deterioration after the operation which causes a lack of co-operation on their part and makes nursing a very trying and difficult matter. Genito-urinary surgeons have always recognised the dangers of the open prostatectomy operation and many attempts have been made to develop an instrument which may be used through the urethra and the removal of all the projecting part of the prostate carried out. The best of these instruments was put on the market as recently as 1930 and by means of a very powerful electric current and a small loop of tungsten the middle lobe and portions of the lateral lobe of the prostate are taken away. This operation is a very difficult one and an expert knowledge of the topography of the urethra and bladder is necessary. The operation is best combined with a preliminary cystostomy. This is done under a local anaesthetic and through a stab incision. This operation does not necessitate the patient being confined to bed and there is no interference either with his ordinary routine. As a result there is no disturbance of his metabolic balance. As soon as the kidney function is better a low spinal anaesthetic is administered and the obstructive part of the prostate removed. The patient can get up the following day and very often pass water naturally as soon as the seventh. The great advantages of this operation are the short stay in hospital, the early convalescence, the absence of a general anaesthetic with its attendant nausea and vomiting, the complete freedom from any dietetic disturbance which might upset the delicate balance between the blood and the kidneys and, if the operation is not immediately successful, it can be re-performed several weeks later without any great embarrassment to the patient; the whole idea is that the surgeon accommodates himself to his patient and endeavours to inconvenience him as little as possible.

There is one other side of the prostatic question which has received a lot of attention within the last few years. It has been put forward that the prostatic disturbance in the male is comparable to the climacteric in the female, and that this prostatic disturbance is due to an imbalance between the various hormones in the body. It is sug-

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