An Address ON UNUSUAL SYMPTOMS DUE TO ENLARGEMENT OF THE PROSTATE.*

BY
G. GREY TURNER, M.S., F.R.C.S.,
PROFESSOR OF SURGERY IN THE UNIVERSITY OF DURHAM.

THIS address is not intended for genito-urinary specialists, or even for operating surgeons, but for those among you who are general practitioners, whose duty it is to see patients at the outset of their troubles and assume responsibility for their diagnosis. Further, what I have to say is entirely from the point of view of the general surgeon, for, though I have always been interested in genito-urinary disease, I have not devoted especial attention to this branch of practice.

I have always been alive to the importance of the problems of disease as they are presented by the "patients' complaints," and my responsibility as a teacher of medical students, who are most of them to become the practitioners of the future, has made me pay particular attention to this aspect of our work. Most of us must have recognized the difficulty of getting clinical knowledge from books, for the descriptions of diseases, as we read them, have been pieced together from many cases. Quite a limited experience of practice of any kind soon teaches how much actual "patients" differ from "cases." Similarly, experience has taught me that a whole variety of symptoms not obviously connected with the urinary system may depend on enlargement of the prostate, and it is to this aspect that I particularly wish to refer.

USUAL SYMPTOMS OF ENLARGED PROSTATE.

As I was putting together my notes it seemed to me that perhaps it would avoid misunderstanding if I enumerated quite briefly the "usual" sort of symptoms which bring patients suffering from enlargement of the prostate under the care of the surgeon. Of course, I fully realize how easy it may be for anyone, like myself, working principally in large hospitals to get ideas on disease which are different from those obtained in general practice. At the same time, practically all the cases are sent into hospital by the practitioners of the district in which I live, so that they represent the problems with which they have to deal.

At the outset I would like to emphasize the truth of the dictum laid down by Sir Henry Thompson, to the effect that enlargement of the prostate of such a degree as to give rise to symptoms demanding treatment does not occur before 50 years of age. It has been quite surprising to me, but it is none the less true, that in an experience of over thirty years I have never yet seen a case of ordinary enlargement of the prostate, that is, non-malignant, except in those over this age.

Now the usual prostatic symptoms can be arranged under one or other of the following heads:

- Hesitation in starting and finishing the act of micturition.
- Irritability and frequency, with dribbling.
- Mostly nocturnal frequency.
- Attacks of retention.
- A culminating attack of complete retention.
- Retention with overflow, and any combination of the above.

I do not doubt that there are other symptoms which will at once stamp the patient as suffering from urinary trouble, probably of prostatic origin, and those whose reputation particularly attracts urinary cases will often be consulted by people complaining of very early symptoms associated with prostatic enlargement, but these are less definite and are not always easy to assign to their proper cause.

UNUSUAL SYMPTOMS OF ENLARGED PROSTATE.

And now I want to draw attention to the *unusual* symptoms which I have promised to discuss.

Early in my career my attention was attracted to this matter by the case of a man whom I saw in consultation

with his family doctor, because he was supposed to be suffering from gastric carcinoma.

This patient, a man aged 67, stated that he had usually been healthy, suffering only from occasional bilious attacks in which he would have vomiting perhaps for a day. Eighteen months before I saw him he had his first real stomach illness when he was laid up for several weeks; it was exactly similar to the attack for which I was consulted. At the same time he was found to be suffering from enlargement of the prostate. His doctor taught him to pass a catheter, but he soon gave that up and had to rise twice every night to micturate. Between that illness and the present one he considered himself perfectly well. About five months before the consultation he began to have pain in the stomach about two hours after every meal. The pain would continue until he was due to take the next meal, but more food always relieved the pain. It was situated about the pit of the stomach and extended upwards towards the chest. When the pain was bad he sometimes brought up a mouthful or more of food, but it was usually watery fluid, and he had only once brought up a little blood. These symptoms continued, and he had lost weight and strength. There had never been any difficulty in swallowing.

When seen the patient was found to be of big, strong build, but obviously not in good health and showing evidence of recent loss of flesh. Occasionally a little gurgling could be made out over the stomach area, but no mass was to be felt, and there was no evidence of gross dilatation nor was there any tender area. There was no fluid in the abdomen, and nothing abnormal could be made out per rectum. An oesophageal bougie easily entered the stomach, the contents showed free hydrochloric acid, and an absence of lactic acid. It was before the days when x-rays were regularly used in gastric cases. The prostate was found to be definitely enlarged, and later his doctor drew off about 14 oz. of residual urine.

As a method of preliminary treatment the bladder was emptied by catheter night and morning. Subsequently the prostate was removed, and this accomplishment was followed by the complete disappearance of all the stomach symptoms.

For the purpose of operative treatment this man was admitted as a case of enlarged prostate to a general hospital, and it is interesting to read the notes made by the clerk entirely from the genito-urinary standpoint, for there is not one word about the stomach symptoms which first sent the patient to his doctor!

This experience occurred over twenty years ago, and in the intervening period I have frequently seen similar cases. A recent example is quite typical, and will serve as a further illustration.

One day I was making a brief visit to my wards accompanied only by the sister, a most experienced nurse whose diagnosis is rarely at fault. In passing one of the beds she asked me to look at a man, 62 years of age, who had been admitted as a case of malignant stomach, and whom she thought looked like it. He certainly appeared to be older than his years, and was white, haggard, and neglected. All his complaint was of a bad stomach, and he put his hands over the epigastrium as the seat of his trouble. I found that the following notes had been made by the house-surgeon:

"Patient admitted complaining of vomiting after meals for past twelve months; no pain; appetite good; loss of weight; bowels regular; no blood seen. Examination: Patient very wasted and looks ill. Abdomen retracted; no definite irregularity. No mass, but tenderness in epigastrium."

As I saw him the man showed signs of recent loss of weight, but I could find nothing on hastily examining the abdomen, and certainly there was no mass in the stomach region. I remarked to the sister that he looked like a prostatic case, and asked her to get the house-surgeon to investigate the patient with that possibility in view. Sure enough he found a very big prostate and residual urine measuring 23 oz. Subsequently the bladder was opened suprapubically and drained. Palpation of the gland suggested that it was probably malignant. This man got great temporary relief, and all his stomach symptoms at once disappeared.

At this stage I would like to draw attention to the value of bimanual examination as a means of detecting the presence of residual urine, when perhaps it is not convenient to test for the latter in the usual way. Of course, the patient must first pass as much urine as possible under the most comfortable circumstances, and I would remind you that few people can do justice to themselves when lying on their backs in bed. When as much urine as possible has been voided the bladder may not be felt distended either from above or from the rectum, but bimanually it may be felt to be as big as a cricket ball, or larger, indicating that it contains from 4 to, say, 10 oz. of residual urine.

Of course, these cases are for the most part sufficiently obvious when the circumstances have been sifted, but difficulties arise, either because patients disguise from themselves sometimes—and certainly from their medical attendant—the fact that there is any urinary abnormality, or because the interpretation which they themselves put upon their symptoms leads them to believe that any urinary

* Given before the Medical Society at Nottingham, December 5th, 1928.

difficulty is a secondary factor and not the real source of their troubles.

I am sure we have all recognized that the art of diagnosis is allied to the craft of the detective, and I hope you will not be surprised when I tell you that I am accustomed to recommend to my class as guides to diagnosis *The Adventures of Sherlock Holmes*, and a little book called *Aids to Scouting* by Baden-Powell.

Now the next case, whose history I obtained from the patient after he had been operated upon, appears consecutive and reasonable enough, but, as a matter of fact, when this patient consulted his medical man, and subsequently a physician, his mind was made up that the cause of his trouble was associated with some bronchial catarrh due to cold, and, on another occasion, to an increasing dyspepsia, and on neither occasion did he volunteer any information about his urinary difficulty. He was just the type of individual who had always been self-reliant and introspective, and it was he who made the diagnosis which he presented to his various medical attendants. Here is the full history, written by the patient himself, a man of 66, in the month of April.

"As near as I can remember it is about six years since I first noticed the change in regard to the retaining of my urine; sometimes I would have to get up twice during the night; then in the morning, after using the chamber, I had to repeat a similar action when I got downstairs. Of course, the same thing was taking place during the day also. I once consulted a doctor, who informed me that it was caused by the neck of the bladder growing weak, which was a natural consequence with people who were getting somewhat aged. Previous to six years ago I had the power to hold my urine for a very long time, but I have felt it diminishing more and more every year since. Nevertheless, my health was excellent up till last December, although I was put to much trouble and inconvenience by the complaint. From December last I could feel my health getting bad. I was then compelled to get up five and six times a night to pass urine, and this went on increasing week after week till I am sure I was doing it into the teens of times a night and day also. The desire used to spring upon me very suddenly and forcibly in such a manner that when it wakened me I felt quite startled and alarmed. Up to six months ago, although I had to micturate often, I passed the urine somewhat freely. It was only after I felt some substance making itself evident in the rectum that I commenced to dribble. The substance or lump never protruded much beyond the anus, and always on the right side, and the end of it felt somewhat hard, rounded, and smooth, but it always disappeared after the pressure due to straining was removed. During this time the anus was very much relaxed and the part round about it was extremely soft. Numerous times I have gone into the lavatory with the feeling to use the urinal only, but after I have stood a while I had to make great haste to get into a w.c. because I had lost the power to retain the excrement. For a considerable time before the operation I used to pass the excrement before I passed the urine, which I did not do when these parts were working all right. For some time before you removed the cause of my annoyance, if I put my hands into hot or cold water there came a strong and immediate desire to micturate, which I had to attend to at once if I wanted to keep my shirt dry. A short time before I was sent in to you I caught a severe cold—I tried some patent medicines to cure it, but did not receive much benefit; also had two bottles from our doctor. On March 6th I was in Newcastle and thought it was time to consult a physician about my illness. I was asked a number of questions and requested to take off my coats. The physician then sounded me by tapping my back, and he also applied his stethoscope and told me to inhale slowly—my chest was treated in a similar manner, after which I was asked to lie down on a bench on my chest, when my back was subjected to the same ordeal as before; then over on to my back to undergo the like process.

"I informed him about passing my urine frequently, and about something making itself felt in my rectum. I was told to bend forward and press down, which I did as much as I was able. He informed me that there was not much the matter with me; I was suffering from a little bronchial catarrh, and that I would soon be better. I obtained a prescription which I got made up in Newcastle sufficient to serve two weeks. To my great surprise every day my health commenced to grow worse and worse; my appetite for food had almost gone; my breath was growing offensive; I then got a cough which I thought came from my stomach; the saliva was frothy and had a disagreeable metallic taste—I could not keep my mouth clear of it. I was so ill that I had to send for my home doctor. After he had examined me he came to the conclusion that I was suffering from catarrh of the stomach—at this time I had a horribly dirty tongue. After I had taken two and a half bottles of medicine, which had not done my stomach the least degree of good, and had lost all desire for food—in fact, if I thought about it it created a nauseous feeling, consequently I was getting leaner every day and the number of times I passed urine day and night went on increasing. I made a great mistake in not informing the doctor about the urinary trouble from which I was suffering, but when I told him about it he diagnosed my complaint at once, and told me that my stomach could not possibly get better if I did not get this enlarged gland removed; hence he communicated with you, and as soon as he obtained a suitable reply I was sent on to you."

In another case I was asked to see a farmer 63 years of age as a case of abdominal malignant disease.

When I first met the patient he at once told me that his trouble was indigestion, and he gave a history that he had been perfectly healthy until four weeks previously, when he got cold which caused pain in the left side of the back. The pain soon got well, but it was followed by a fiery heat of the stomach for which he drank a tremendous lot of cold water. After this he began to lose his appetite and felt very ill. There was considerable loss of weight, but this he attributed to the fact that he had not been able to take food. I found the patient a very fresh-looking man, but with a dry red tongue and sourish breath. When he presented his abdomen for examination there was an obvious swelling in the lower part which was the over-distended bladder reaching nearly to the umbilicus. Up to this point he had said nothing about his water, and even on interrogation he would not admit to any urinary trouble until the onset of the present illness. He then found that he had to pass urine very frequently and at once, but for this he blamed the large amount of water which he had taken. Latterly there had been frequent desire to micturate with difficulty in getting the urine away. Per rectum the prostate was found to be very large and was pushed down by the distended bladder. The enlargement was dealt with by the suprapubic operation; the patient made a splendid recovery, and is alive and well ten years afterwards.

In another case of the same kind the man, also a farmer, had been in failing health for some time, but having a great dread of doctors, and especially surgeons, he refused to consult his medical man until about a fortnight previously, when he sent for some medicine to relieve vomiting. When my friend called he found the patient in bed, looking very ill and complaining only of his stomach and vomiting. On examination the bladder was greatly distended; the urine contained albumin, and rectal examination revealed an enlarged prostate. In this case the trouble had evidently been going on insidiously for a very long time and the kidneys were already much involved. The man was relieved by suprapubic cystostomy, but he did not live long and was never sufficiently well for the radical operation for removal of the prostate to be performed.

Another man, 62 years of age, who followed the calling of a commercial traveller, was well aware that his urinary apparatus was not in good working order, but it was only when he began to suffer from nausea and a distaste for food that he sought surgical advice, and he did not connect these symptoms in any way with his old urinary trouble. As a matter of fact the whole of the mischief was due to enlarged prostate, for he made a very satisfactory recovery after a two-stage operation, and now, eleven years afterwards, he is in perfect health and able to carry out his duties as well as at any time during his life.

Quite often the presence of a distended bladder has led to difficulty in diagnosis. A very able practitioner of whom I have the warmest recollection, for he acted as a mentor in my earliest days, and had sufficient confidence to entrust me with surgical work at the very outset of my career, was himself misled in dealing with one of his old patients, a man aged 72, who had been complaining for some time of trouble with his bladder; the real reason for concern, however, was the advent of stomach symptoms with some failure in his cardiac apparatus. In writing about the patient my friend mentioned the symptoms and then concluded, "But what I want to know is what is this swelling in the middle line which feels so soft and elastic." As a matter of fact it was a big distended bladder containing 36 oz. of residual urine. In this case also the prostate was removed and the patient made a satisfactory recovery.

Among my treasured possessions is a letter which was sent to one of our surgeons by a well-known physician. I merely mention the standing of this gentleman to show you how easy it is for those trained in clinical observation to be occasionally misled when they are confronted with some condition the like of which is not perhaps frequently brought to their notice. In this case the patient was suffering from nothing worse than a distended bladder, but, as you will see, it was mistaken at first for an obscure tumour. The letter reads as follows:

"Dear Mr. —, "July 19th, 1902.
"This gentleman came to see me to-day for the first time. He complains of vomiting without pain; quantity of vomit not large. I find a solid, movable growth in the abdomen which curiously resembles in general form and site a uterus pregnant about 5½ months. I have sent him to you for you to consider the advisability of exploring the abdomen. There is a soft systolic bruit at the apex; but the second sound at the pulmonary area is not accented, and the heart action is fairly regular.
"The urine is alkaline (probably from taking 'Carlsbad salts') and contains a very distinct trace of albumin; no sugar.
"Yours very truly."

Forgive me if I allude to another case illustrative of this same point, although, as a matter of fact, the urinary obstruction in this particular example was the result of stricture and not an enlarged prostate.

A man, aged 66, was sent to me by a very discerning doctor friend with a note to this effect: "Do you mind seeing this case for me, an abdominal tumour, not a spleen." The patient only complained of the "lump" in the abdomen. He would not admit that he had any overflow, and certainly his clothes were not in the least damp. He stated that his trouble had commenced four years previously with inflammation of the bladder, but that since then he had not had trouble until he noticed the lump which sent him to his doctor for advice. Fifty years before he had suffered from gonorrhoea. A further examination disclosed a very tight stricture in the deep urethra, and the "tumour" was nothing more than the chronically over-distended bladder.

Intestinal symptoms occasionally overshadow those of obvious urinary origin, as in the case of a man who was sent up with a note stating that he had a history of possible intestinal growth, but that nothing could be felt either on abdominal palpation or rectal examination. None the less the presence of an enlarged prostate had been noted. The fact was that the uncomfortable colic from which this man suffered was simply due to the effects of his enlarged prostate with residual urine.

In a case which I have particular reasons for remembering the patient was a rather older man of 70 years, whose symptoms were entirely rectal. Ineffectual straining and tenesmus, with some prolapse of the mucous membrane, difficulty in voiding faeces, and occasional bleeding, certainly suggested that the cause of his trouble would turn out to be a rectal growth. As a matter of fact, he only suffered from an unusual degree of enlargement of the prostate, and he was completely cured of his rectal discomfort by its removal.

Quite recently I was consulted by a retired sea-captain, a bluff old veteran of 77 years, who came complaining of flatulence and discomfort in the abdomen, and the desire to void wind with pressure; also of some frequency of micturition. He complained that he was always thirsty and had a very dry mouth. In writing about this patient his doctor mentioned that he had a large, round swelling in the abdomen which puzzled him; he stated that it was tense, as if containing fluid, and yet the patient passed water fairly well and had no dribbling. This man turned out to have a distended bladder containing 55 oz. of residual urine. The latter was of low specific gravity and the urea was diminished, but as a result of a two-stage operation he made a satisfactory, though rather tedious, recovery.

Rectal symptoms are sometimes present when the prostatic enlargement is not very marked, and only recently I was rather puzzled by a patient, 60 years of age, who complained of a constant desire to empty the bowel with ineffectual evacuation. In this case the prostate was enlarged and nodular, and, although I feared malignancy, the condition improved very much as the result of treatment, but some months later there was a recurrence with the advent of stomach trouble suggestive of growth, as in the cases I quoted to you at the outset.

A very good example of a patient's misinterpretation of his own symptoms recently came under my observation.

The patient was a man of 54, who assisted his wife in the conduct of a beerhouse. For two or three years he had suffered from discomfort in the abdomen. During this time he was accustomed to drink freely, and he was inclined to blame this over-indulgence for his troubles. Finally he consulted his doctor, who, suspecting stomach trouble, looked at the tongue. This was dirty and thickly coated, but also presented a very obvious papilloma. The man was at once told of the potential danger of this growth, and was sent to hospital for advice as to its treatment. While conducting a leisurely examination for teaching purposes, and with the help of a student, we noticed a very urinous odour. This prompted a more general examination, which at once disclosed a distended bladder with overflow from enlargement of the prostate. When questioned the man admitted that he had been disturbed four or five times each night, but again he blamed his addiction to beer. Latterly his urine had run away without control, and this had caused him to become alarmed.

One of the most important pitfalls of which we must be constantly aware is the class of case in which the patient blames some obvious condition like a hernia or hydrocele for a general failure of health which is really dependent on disorders the result of an enlarged prostate. This is a matter to which I have previously referred, and at that time I ventured to suggest an aphorism which has proved so useful that I would like to recommend it to your notice. It is as follows: "The occurrence of unaccustomed symptoms in chronic conditions is suggestive of some new disease." The following is a case in point.

A gentleman, aged 67, whom I had previously seen on account of some thyroid enlargement, came complaining of a swelling in the right inguinal region, which he had noticed for eight or nine months. He said that latterly it had caused him some pain and discomfort in the lower abdomen and especially after supper. On examination I found an ordinary oblique inguinal hernia. Incidentally, during the course of the examination, the patient

mentioned that for a year or more he had noticed increasing trouble with his water—frequency in the mornings, dribbling, and some difficulty in getting the urine away. His appetite and general condition appeared to be unaffected. On rectal examination the prostate was found to be big, rounded, and smooth, certainly twice the normal size, and there was residual urine. In this case prostatectomy was carried out with complete relief of the uncomfortable symptoms which the patient had attributed to his hernia.

The etiology of some of these more general symptoms is quite interesting. Probably they are for the most part due to a certain degree of renal insufficiency and are really an evidence of latent uraemia. Their consideration brings us to the question of so-called "back-pressure," which is so commonly spoken of in connexion with obstruction of the lower urinary passages. It is, I think, an unfortunate expression, because it suggests, at least to my mind—and I have heard it mentioned by others—that the secreted urine goes on accumulating at its usual rate and causes such great pressure in the bladder and kidneys as to give rise to the symptoms which we associate with latent uraemia. As a matter of fact, I hold that such a purely mechanical explanation is untenable, and I believe that what really happens presupposes an amount of intelligence, so to speak, on the part of the renal secretory apparatus. When, for instance, the kidneys discern that the urine does not escape in the ordinary way, there is a holding up, so to speak, of the work of the epithelium, secretion diminishes, and in consequence there is an accumulation of noxious products in the blood. Both these matters would seem to me to be within the scope of easy experimental inquiry, and I commend it to someone with leisure to carry out what would prove, I am sure, a most interesting investigation.

MALIGNANT PROSTATE.

In connexion with malignant prostate there may be a variety of symptoms which may prove very puzzling. Quite usually they are not directly connected with the urinary organs, not only in the first instance, but even until comparatively late in the development of the malignant disease. Some of the special features to which I would particularly draw attention are complaints of "sciatica" or "lumbago" or "oedema" of one or other lower limb or of the lower part of the abdominal wall, or "enlargement of the groin glands." Pain in the perineum is more ordinary and more suggestive of genito-urinary trouble; it may be the only complaint for a long time, and it may be present when urinary symptoms are entirely absent. It is disconcerting to find to what an advanced degree malignant disease of the prostate may attain before it gives rise to any symptoms whatever. The following is a case about which I was greatly distressed.

A distinguished man whom I saw quite recently was, in his 78th year, in such excellent health that he surprised his friends with his superabundant energy. Only six weeks before I saw him he began to have some day and night frequency of micturition. There was no pain, never any blood in the urine, and at the end of that time he looked in his usual robust health. On rectal examination I was shocked to find a large, hard, infiltrating mass arising in the prostate and extending up into the base of the bladder. On bimanual examination it was obvious that there was a good deal of residual urine, and after this was withdrawn the large mass felt per rectum could be determined bimanually, so great was its size.

In another case what was dubbed "sciatica" was the principal symptom.

The patient was 69 years of age, and, on going into his history, he complained that for several months he had been troubled with wind in the bowels and difficulty in getting them open. Closer inquiry showed that the pain which he called sciatica was really down the inner side of the leg, but it was bad enough to prevent sleep. After examination I wrote to his doctor as follows:

"I have just seen your patient and I find him a most interesting case. I have very little doubt that he has a malignant growth of the prostate—not of the rectum as I was inclined to think from his history. In the situation of the prostate you will find a hard, nodular mass spreading out to the pelvic wall on either side and closely adherent to the bone. You will also notice that the pain in the leg is down the inner side in the distribution of the obturator and not in the sciatic region. I do not quite understand why he should have so much trouble with the bowels, but he admits that it is mostly about the region of the sphincter, which may explain his difficulty. I am sorry to say that it is not a case in which removal can be thought of, and we will have to rely on medicine for his relief."

It is interesting to note that this patient died just about a year after the time that I saw him, and it was only for

the last two months of his life that he had to depend upon the catheter. The pain became very severe, he gradually grew weaker, and his end was hastened by some form of oesophageal obstruction.

So-called "lumbago" as well as sciatica appears to be very common at the outset of malignant disease of the prostate, and would more than ever indicate the well-known rule that in both these conditions a rectal examination is essential. Of course, in dealing with the industrial class, an injury is often blamed, and in one such case careful x-ray examinations of the pelvis had been made in search of an old fracture, but an ordinary rectal examination disclosed a large mass of growth originating in the prostatic area.

Oedema, with swelling of one of the lower limbs, has several times directed my attention to the prostate, malignancy being suspected and usually found.

In one such case, in a man of 64, the only complaint was of swelling of the left leg, which he had noticed for about ten weeks before the time of his visit; there had not been much pain. On inquiry it turned out that a year previously he had called in his doctor for what was said to be rheumatism in both feet and one hand. After this illness he was left weak in the bladder and had to be quick in getting to a convenience. At this stage in the recital of his history he said that he blamed the water trouble for bringing on the swelling of the leg, and I have a note in my book, between brackets, suggesting that a malignant prostate would be found. He certainly looked a seedy individual, prematurely old and with marked loss of flesh. The affected leg was twice the size of its fellow from lymphatic oedema, and there was a considerable amount of oedema about the genitals and in both groins, while enlarged hard glands were felt in the latter situations. There was no evidence of distension of the bladder, but on rectal examination the prostate was found to be enlarged, hard, nodular, and fixed, and there could be no doubt as to its malignant nature.

The following is a somewhat similar case.

A man, aged 76, complained of oedema of the left leg, which he attributed to a blow that he had received three months previously. The leg was found to be almost solid below the knee, and the groin glands on both sides were enlarged and hard. On going further into his history he admitted that for two years there had been some frequency of micturition and that it had recently become very bad by day as well as by night. In this case the bladder was almost up to the umbilicus, and the prostate was slightly enlarged, hard, nodular, and fixed.

In the last two cases the enlargement of the groin glands had not been noticed by the patient and had given rise to no trouble, but it was otherwise in the following case.

A man, aged 70, was sent to me one April at the suggestion of a consulting physician with regard to the advisability of the removal of a mass of glands in the right groin. He gave a history that in the previous October he first noticed swelling of the left leg. For that he had rested in bed for a month as the condition was said to be due to a thrombosis of the internal saphenous. At the time of his visit he told me that he had no urinary trouble, though he did admit that he passed water rather slowly, which he attributed to some weakness of the bladder depending on his age. He did not think that he had lost weight, and certainly looked the big, strong, healthy man that we had been accustomed to see about for many years. There was some oedema and slight discoloration in the region of the right groin. The most prominent gland was of walnut size in the vertical set of femoral lymphatics, but there was a less defined enlargement of the horizontal set, and in the pelvis, above Poupart's ligament, a mass could be felt extending along the brim. On rectal examination the prostate was found to be definitely malignant and was invading the region of the right seminal vesicle. At that time there was no sign of more distant dissemination, but the patient eventually died with multiple secondary deposits all over, though growth in the liver was the most prominent feature.

Recently a public man, who was well known for his municipal activities, was sent to consult me by his doctor, who had discovered him to be suffering from a malignant prostate. The history in this case is very interesting as bearing on this question.

This patient, who was 66 years of age, stated that until two years previously the bowels had been absolutely regular. About that time he began to take grape-fruit, and noticed the onset of constipation and that sometimes the act of defaecation hurt the passage. This trouble, although it only came on at intervals, got steadily worse, and sometimes he had very severe pain lasting for an hour or more after evacuation. About three months previously he began to notice a new pain about the rectum, this time quite independent of evacuation. It came on in attacks and disappeared after a rest. If he could void flatus he got some relief, and was also helped by medical treatment. All this time there was no complaint whatever of urinary symptoms, and even on cross-questioning the patient would not admit that there had been the slightest trouble; the most that could be elucidated was

that sometimes he had to get up once during the night, but this only if he had taken a good deal of liquid. He looked absolutely fit and well, and there were no external signs whatever, but on examination the prostate was found to be embedded in growth which was excessively hard and surrounded the lower end of the rectum, leaving a rigid channel which just admitted a finger. It was as if the base of the bladder and the rectum had been embedded in plaster-of-Paris.

Sometimes, and I think more usually, these patients do complain of pain and soreness in the perineum, as in the following case.

A big, handsome man, a farmer, who appeared to be in the pink of condition, gave a history that in March he began to have pain and soreness in the perineum, which troubled him when he attempted to get over fences. Later on it made him unable to ride round his farm. Soon afterwards he began to be troubled with frequent micturition and had to get up two or three times every night. The pain was then worse at night, and he had to lie with his legs apart to get some ease. When I saw him in August he looked quite well, but he was not so vigorous as formerly, and he had to rest at times, instead of pursuing his life of strenuous activity. There was no loss of weight, and he took his food well. The general and external examination was quite negative, but rectal examination disclosed a large, hard, nodular prostate with infiltration and fixation of the whole of the pelvic floor. Eventually this patient had such great urinary difficulty that a suprapubic drain had to be inserted.

In a man of 53 the first symptoms of malignant prostate were stabbing pains down the outer side of the thighs. Soon after this he had an illness following a rigor, and this was succeeded by pain in the perineum and a frequent desire to empty the rectum. Evacuation gave him some little relief, but when I saw him some months afterwards there were no urinary symptoms, in spite of the fact that his prostate was most definitely the source of his trouble.

In some few cases even distant dissemination is present before patients have any symptoms to direct attention to the urinary organs, and I have twice seen patients with secondary malignant glands in the left posterior triangle of the neck who were unaware that the urinary organs were the source of their troubles.

MANAGEMENT OF PROSTATIC CASES.

I will now deal with one or two points of considerable interest in connexion with the "management" of the prostatic case. That old word has always appealed to me, and it seems to epitomize our duty with regard to this particular sort of case very well indeed. One of the most difficult problems for us all is to decide when an operation should be advised. Personally I have no hesitation in saying that I much prefer to deal with patients who have the most trouble, for I have usually found that they have done better than others, and further that they have appreciated the benefits of surgical treatment much more than those patients who have not suffered very much before operation was carried out.

At the outset I would like to emphasize very strongly that the success of the operation for removal of the prostate depends entirely on the relation of the symptoms to the enlargement of the gland, and, if I may put it so, only those patients who suffer because they have an enlarged prostate will be cured by its removal! If operation is performed at an early stage there is a risk of removing the prostate when, as a matter of fact, the symptoms may be due to some other commencing disease. I have, I think, indicated sufficiently the difficulties connected with the very early cases, and I want to tell you the remarkable history of a patient whom I was asked to see by a very alert doctor friend at the time when prostatic surgery was looming large as a result of the pioneer work of Freyer.

The patient, who was suffering from his first attack of retention of urine, was a healthy man, in good general condition. The urine was absolutely normal, and the prostate was only slightly enlarged. As it was his first attack I deemed it wiser to see what could be done by the regular use of the catheter. At that time I only knew that the treatment advised had been effective, and that the patient made a satisfactory recovery; but fifteen years later I was asked to see this same man again. He was then 84 years of age, and he told me that after his previous illness he made a complete recovery, and was very active and well until two years before, when he began to be troubled with some urinary frequency at night-time. These symptoms culminated in an attack of retention which could only be relieved by the use of a silver catheter. The patient looked in very good condition for his years, though the prostate was very large. Again

he made a complete recovery as the result of catheterization, but, of course, the nocturnal frequency continued. Nevertheless, he was so comfortable and so active that he would not agree to any operative intervention.

Many difficulties arise at the other end of the scale—that is to say, when the patient is extremely ill as the result of long-continued urinary obstruction, and it becomes a question as to whether the risks and discomforts of an operation should be urged. In this connexion the story of an old man of 77 who came under my observation some time ago is very instructive. This patient stated that for some years he had suffered from nocturnal frequency with inability to empty the bladder and consequent discomfort. This was followed by a general failure of health, with swelling of the legs, and culminated in an attack of retention which demanded the catheter for its relief. It was at this stage that he was sent to me for an opinion with regard to the advisability of operation. I found a very ill-looking old man with an irregular heart, emphysematous lungs, considerable dyspnoea, and oedema of both legs. The distended bladder was like an abdominal tumour and the prostate was enlarged and suspiciously hard. After examination I wrote to his doctor as follows:

"I am very much obliged to you for sending Mr. M. to see me. Obviously this is not a case for radical operation, and in any event the patient has not very long to live. I strongly suspect that the prostate is malignant, although I confess that the physical signs are not sufficiently definite to entitle one to give a decided opinion on this point.

"I have urged him to allow you to pass a catheter. I would suggest that the instrument should be used some time during the evening, and that you should draw off about two-thirds of the urine. Probably this will give him a much better night, but if it does not do so then it is not worth while persevering with this plan. If I am wrong, and he continues to live after a month or so, then I should be willing to put in a suprapubic drain through a trocar and cannula, but I do not urge this plan as it is attended with considerable risk in one so ill, and I do not care to raise false hopes.

"Some day be sure to let me know, first, if drawing off the urine as I suggest does give him a better night, and second, the date and circumstances of his death.

"By the by, he was extremely anxious to have some medicine, and I think that tincture of digitalis in 15-minim doses thrice daily would probably do some good."

You will understand my surprise when I learned that some five months afterwards this man was so much improved that he was able to resume work on his farm, and had been seen by his doctor on top of a haystack. As a matter of fact, he lived in very good health, and was able to work regularly, for three more years, but at the end of this period he began to fail, and died at 81 and 9 months, without any evidence of urinary infection, in spite of the fact that the catheter had been passed for him by his farmer son some thousands of times.

Operative details are outside the scope of this address, but to make my review complete I would just like to say that I have come to believe that, for the majority of these cases, the operation in two stages is by far the best. I would put it this way: that though I have very often had to regret that I essayed the one-stage operation, I have never regretted the adoption of the two-stage plan, although I quite admit that possibly some of the cases dealt with by two operations might have been successfully tidied over the ordeal by one. I speak of two-stage "operations" simply because the circumstances in which I work have taught me that it is much better to make a suprapubic cystotomy rather than endeavour to have preliminary catheter drainage carried out. The latter plan is unsatisfactory with overworked wards and constantly changing house-surgeons and assistants, who never have an opportunity of becoming familiar with the difficulties that may be encountered. The first stage may be simply a suprapubic puncture, using the Morson trocar, but there again I feel satisfied that freer drainage is better, and the results superior if a suprapubic opening of the bladder is made. As a rule this first stage is carried out under general anaesthesia, unless, indeed, the patients are extremely ill, or of the thin and wasted type. The time between the stages varies very much, depending upon the progress of the patient. Usually the interval is not less than two weeks, and, in fact, on the rare occasions when I have felt it safe to intervene at a lesser interval, then, I think, without a doubt the operation might have

been conducted by the one-stage method. Very often three or four weeks are allowed to elapse, but there is no rule as to the time, and the surgeon must attend on Nature, since it is foolish to intervene as long as the patient is improving, and it is unwise not to take the full advantage of this preliminary relief to the kidneys. The decision as to when the patient is sufficiently well for the second stage does not depend on chemical tests alone, but is mainly judged clinically, and I do not intervene until the patient is cheerful, is sleeping well, has a good appetite with a clean tongue, and presents a thoroughly healthy granulating wound. All these features must be satisfactory or the result is likely to be disappointing. It is in cases in which there is some doubt with regard to the clinical evidence that the examination of the blood urea may be so helpful.

MORTALITY OF PROSTATECTOMY.

For quite a long time I have been accustomed to hear uninformed people rail at the mortality of operations for removal of the prostate, and I have frequently been filled with a sense of shame to hear the opinion expressed that the general mortality in hospitals is something approaching 50 per cent. This is a gross misstatement of the true state of affairs, certainly at the present day. In my own series of cases, which includes the period during which I was trying to learn the technique and the management of the operation, my over-all mortality (that is to say, taking the two-stage with the one-stage operations) was 12 per cent.; for the one-stage operations alone the mortality works out at 19 per cent., and for the two-stage operations just 10 per cent. Most of these operations have been performed in our general hospital, but in keeping the figures I make no distinction between private and public hospital work, and the figures which I have given include the total number of cases, wherever the operation has been conducted. The mortality is steadily diminishing, and is now in the neighbourhood of 5 per cent. This approaches the wonderful figures which were obtained by Freyer, who was able to refer to a mortality of only 3 per cent. in one large series of cases, and those of Young, who in 450 cases had a mortality of just 3.75 per cent.

It is probably those who are so sceptical in regard to the mortality of prostatectomy who speak so scathingly about its advantages. Happily I have been in practice sufficiently long to have been a witness to the utter misery of so many of the victims of prostatic hypertrophy in the old days before the radical operation could be successfully employed; I am therefore able to appreciate the enormous advantages of the methods which are now commonly used. Of course, the period for which these patients enjoy the advantages of the operation is a poor way of assessing the benefits conferred, because in elderly men who require operative treatment the normal expectation of life cannot be long. For instance, in one series of my own patients the average age was 65 years, the youngest being 54, and the oldest 84. But the advantages conferred in some of these cases are incalculable. The following is one of the most striking examples with which I am familiar.

The patient was an old man—particularly old for his age—of 68, who for twelve months had been greatly troubled with nocturnal frequency. The number of times he had to get up gradually increased until he was disturbed not less than a dozen times each night. He was also greatly distressed with frequency during the day, and was only able to pass a very little urine at a time, and that without any force. To add to his troubles he had a severe attack of cystitis, and this was little improved by the irrigation of the bladder which was conscientiously carried out by his doctor. He never suffered from retention. Perhaps this was unfortunate, because quite often the attack of retention which precipitates active treatment is really an intervention of providence which demands that relief which might otherwise be unduly delayed. A mere recital of this man's symptoms can give no idea of the misery of the situation. In the twelve months during which he had suffered his condition had deteriorated so much that he had become a miserable, dirty old man, who neglected himself and his surroundings in a painful way. His condition had made him decrepit and bordering on simplicity, and, as he was a bachelor who lived in lodgings, his relatives were seriously embarrassed because it was found so difficult to get him rooms on account of his dirty habits, soiled beds, etc. Without much prospect, therefore, an operation was undertaken in the hope of so far restoring his condition that he would at least be able to look after himself and cease to be an

annoyance to those about him. The operation was carried out in two stages, and after a rather prolonged convalescence he eventually made a very good recovery. His gain in self-respect was extraordinary, and it was a remarkable thing to see this patient some months afterwards, nicely dressed, with white spats and a smart tie, and an undoubted concern for female regard. This happy state continued until four years afterwards, when he died of some condition unassociated with his prostatic troubles, but the details of which I have never been able to ascertain.

The after-history of very many cases is similar, and I merely select a few at random, as I know that many of you, from individual experience, will be able to supply many telling examples. The following is a very striking case.

A man of 60, a hard-working, conscientious artisan, whose symptoms had extended over some years, had evidently suffered so much from renal disability that his working capacity was seriously impaired. The operation had to be carried out in two stages, and his convalescence was attended with considerable anxiety because of symptoms of latent uraemia, but he finally made an excellent recovery, and now, thirteen years afterwards, is fit and well, happy that he can continue his laborious toil as a ship's plater, and willing to carry on in spite of his 73 years, as long as he can find employment.

Another man of the same age had suffered for ten years from urinary trouble, which had increased so much as to interfere very seriously with his ordinary avocation as a commercial traveller. He was very ill, and five weeks had to elapse between the primary operation and the removal of the prostate, and even after that his convalescence was long and tedious, and for a time the prognosis appeared doubtful. However, after a few months his health was restored, and now, thirteen years later, at 73 years of age, he writes me that he is as well as he has ever been in his life, and has recently undertaken renewed responsibility on behalf of his firm.

Another patient, whose history I have already detailed, is so vigorous fourteen years later that at the age of 80 he is still able to walk ten miles without undue fatigue, and has travelled over a large part of the Continent since his operation.

The oldest patient on whom I have ever carried out prostatectomy was 84 years of age and had suffered for long from urinary trouble. The operation was in two stages, and he made an excellent recovery. Unhappily his illness proved so severe a tax on his wife that she succumbed to what I believe was simply the undue exertion associated with her devoted attention to the old gentleman. After his own recovery he was able to take long walks every day, and during the war he went back to his business, from which he had previously retired, and put in long days behind a shop counter. Finally, at 93, the lamp went out, having flickered for some few months, but without any definite cause, the end being like the wearing out of the machinery of life's needful little ways.

Numberless other cases could be quoted, and it is quite usual for patients to speak of "a new lease of life," "a complete restoration to health," and so on.

In some few cases the results have been brilliant in spite of the most unpromising outlook, and I am reminded of a poor fellow who lived in lodgings and who was suffering from diabetes, which for a long time deterred me from attempting the relief which prostatectomy alone offered. He was in such misery from his prostatic condition that he was willing to run any risk, and I am glad to be able to say that the operation was followed by an excellent recovery, which he greatly appreciated.

Sometimes, contrary to all canons, we carry out operations which appear to be contraindicated, and I have in mind two such cases. In both, operation was refused by surgeons who have taken a particular interest in genito-urinary disease. In one case the patient had been condemned to a permanent suprapubic drainage, but at the end of eighteen months he was so dissatisfied that he was willing to undergo any risk, and he made a very satisfactory recovery, being alive and well six years later at the age of 80. Another patient who was refused operation had reached the end of his endurance, and here again, although the circumstances appeared to weigh heavily against his recovery, he did excellently, and is alive and well years afterwards, and classed among my most grateful patients.

REFERENCE.

¹ The Importance of New Symptoms in Old-standing Disease, *Clinical Journal*, June, 1915.

RADIUM AND ITS ACTION.*

BY

W. E. DIXON, M.A., M.D., F.R.S.

(From the Pharmacological Laboratory, Cambridge.)

M. BECQUEREL in 1896 noticed that uranium salts affected a photographic plate through an opaque medium, and a few years later similar effects were described for thorium, polonium, and radium. All these metals emit three varieties of rays in different proportions, which are constant for each metal. Radium salts are, however, by far the most radio-active substances known, and have in recent years assumed a great importance in medicine. Indeed, the only practical application of radium at the present time is in medicine, and in this communication radium only will be considered.

Source.

In the early days radium was prepared in Austria from local ores and in France from Portuguese ores; later it was extracted in the United States, and now it is obtained practically entirely from the Belgian Congo. The ores from which it is extracted may be classified as follows:

- (1) Pitchblende, an impure uranium oxide found largely in the Belgian Congo. It contains uranium, lead, silica, iron ore, and selenium. The British Radium Corporation deal with pitchblende at Trentwith in Cornwall, but they have extracted probably not more than 10 grams.
- (2) Carnotite is a potassium uranyl vanadate, and is obtained from Colorado and Utah.
- (3) Autunite or uranite is a calcium uranium phosphate containing lead, and is found mainly in Portugal and Australia.
- (4) Betaphite found with mesothorium in Madagascar.

The history of the commercial production of radium is instructive and may be said to have passed through three phases. The first was that of the Austrian monopoly, during which radium was prepared mainly from the pitchblende of Joachimstal in Austria, and to a limited extent from the uranite of Portugal. The price during this phase fluctuated greatly. In 1905 it was marketed at from £5 to £10 per mg.; in 1909-10 at £15 to £27; and in 1912-14 at £36 per mg. The mines in the United States of America were now, however, competing, and as a result of this the price dropped in 1915 to £32 per mg., and in 1916-22 from £24 to £21. At this period the mines in the Belgian Congo were producing and made their presence felt, so that in 1923 the price further dropped to £14, and it now stands at from £10 to £12 per mg. When the mines in the Belgian Congo were in full working the American plant was shut down, perhaps because they could not compete economically with the richer Belgian ores and cheaper labour, though American authorities have stated that the reason was that as much radium had been produced as was needed. Before the Belgians operated, Europe had produced perhaps 60 grams and the United States 160 grams. If we place the total radium in the world at 320 grams we know that America possesses half or more than half of this amount. In 1923 the hospitals in the United States possessed 120 grams.

At the present time the Belgians hold the economic monopoly of radium production. In 1923 their plant produced 4 grams a month, and to the end of 1924 had produced 110 grams. But their sales did not equal their production, since in 1924 they sold only 22 grams of radium, which suggests that either their works were slowing down or they were accumulating stocks. It is necessary to appreciate these conditions in order to be clear that plenty of radium is available to meet all urgent demands provided that the price is forthcoming; it should also be remembered that the radium once produced lasts practically for all time.

The British Government has a Radium Committee now sitting to search for new radium fields in the British Empire, and within the next few years we may confidently anticipate the working of new mines, which, by competition, must inevitably lead to some reduction in price.

* Abstract of a lecture given in Cambridge.