extended at the knee and down to the ground he came. The treatment offered only two alternatives, the rectification by operation of the faulty position of the lower fragment of the femur, or the use of an instrument so constructed as to prevent complete extension of the leg at the knee; the latter course was chosen.

Fig. 2 is an x ray photograph of the case which will explain itself, and should be contrasted with Fig. 3, which shows exactly the reverse condition, the lower fragment having united with the condyles pointing backwards in such a way that when the leg was fully extended at the knee it was still bent upon the thigh. I quote this case particularly in some detail, not because it would be likely to deceive any but a very careless or inexperienced person, but because it demonstrates so well (especially if taken together with that shown in Fig. 3), a condition which if it occurred in a very slight degree might readily be misinterpreted unless the importance were realized of bearing in mind the fact that apparent abnormal movement in the knee-joint may be due to causes outside the articulation, and to show the supreme importance of the use of the x rays in all of these cases.

AN OPERATIVE DEMONSTRATION OF THE OCCASIONAL DIAGNOSTIC ACCURACY OF THE X RAY IN URINARY STONE.

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[WITH SPECIAL PLATE.]

SOME surgeons are rather disposed to undervalue the use of the x ray in the diagnosis of urinary disease, because the method is only occasionally helpful in obscure cases, and because it is only an atom and not the entire molecule of clinical investigation.

Others, again, do not seem to be guided by any rules for the interpretation of the shadows which are shown on the plate, and are quite content to accept the opinion of the radiographer, upon whom no responsibility should rest. No wonder such casualists are disheartened by the mistakes and failures which must necessarily occur. But surely there is a middle course. Let us admit many failures, some fallacies, and very decided limitations for the x ray, but let us employ it routinely when it is possible, and control its findings by operative work. Upon some such sound basis as this let rules of shadow interpretation be framed. If this be done, it will be found that the accuracy of clinical detail occasionally revealed by the shadows will be simply startling. I have given you certain rules which have guided me in my estimation of the character of x-ray shadows, and these are based on 1,000 radiographs of urinary disease. I admit they are merely tentative, but I can give no greater evidence of my dependence on them than by utilizing three or four of them this afternoon to draw for you on the blackboard a rough sketch of the left kidney of the patient who has just been brought into this theatre for operation. I only ask you to remember I cannot do this in every case; it is merely done now in this exceptional instance to show you how valuable the clinical evidence of a radiograph may occasionally prove.

This young man is sent by Mr. Richard Whitlam, of Fulham, with a note that there is probably a stone in the left kidney accompanied by serious destruction of that organ. The patient has but few symptoms. He has had a slight pain in his left loin on and off for ten years, which he ascribes to "wind," but his urine contains $\frac{1}{2}$ to $\frac{1}{4}$ acid pus, which is obviously pyelitic, and on examining the left loin an enlarged but fixed kidney is distinctly to be felt. I will first sketch this kidney on the board, and show the changes in its contour and texture; I then propose to do nephrectomy, which I think will be necessary. If so, the section can be compared with the diagram, and finally I will explain to you the steps by which the clinical assumptions were arrived at.

This radiograph (Fig. 2) was taken by Mr. Harnack, of our radiographic department, and from the negative, for I do not believe in prints, I gather the following facts,

which I illustrate diagrammatically (Fig. 1): The left kidney is dilated by back pressure. This was originally a hydronephrosis, but as much pus has latterly appeared in the urine, I take it the kidney is now in a state of hydro-pyonephrosis. I therefore draw the kidney dilated, and write the diagnosis at the side. *You notice especially that I do not mark a dilated pelvis; there is no pelvis.* Secondly, I know the lower pole of the kidney is transformed into a smooth-surfaced, thin-walled cavity, which is merely a dilated lower calyx, and within it six smooth oxalate of lime stones are lying free. I mark this cavity off and put six little circles to represent the stones in it. To prove to you the thinness of its wall, I shall raise the lower pole in a few minutes to the surface of the wound, and you will see that the cortex will dimple under the slightest touch of the finger. This, of course, indicates thinning. To remind you, I will write "dimpled cortex" opposite this area. Thirdly, higher up on the convex edge of the cortex in the lower middle part of the kidney is an independent projecting cyst. I draw a bulge at this spot and put "cystic cortex." On incising this I shall release a quantity of inodorous pus, and on inserting my finger I shall find another dilated calyx so over-distended as to form a projecting cyst. The mouth of this cyst-forming calyx is blocked by the knob end of an oxalate of lime stone. I mark this stone, drawing two little curved lines from its neck. Fourthly, higher up again the cortex of the kidney may be thicker, but the upper pole is also transformed into a cavity which contains no stones. I cannot say if there is a real cyst at the upper pole or not; I can, however, assure you that it is extremely dilated, so I will just dot the convexity of the pole to denote this. Lastly, an oxalate of lime stone is in the pelvis, and it has a nose or conical projection in front. I know that this nose of the stone has blocked the pelvic outlet and back pressure has resulted. It is, in fact, "a plugging stone," so I write this at the side. I may finally add that the oxalate of lime stone in the pelvis of the kidney is somewhat dumb-belled in shape, so I draw it of this shape; its surface is rough with phosphatic deposit.

The operation was now carried out. The cortex was exposed, and the lower lobe was raised and shown to dimple under the pressure of the forefinger; higher up the projecting cyst was demonstrated, and 6 oz. of inodorous pus and urine were sucked out from it. Nephrectomy being found necessary, the organ was removed. After the wound was closed the kidney was cut lengthwise for demonstration (Fig. 3). The changes in it were proved to be as depicted in the diagram on the board. The kidney was dilated greatly in all parts, the cortex being extremely thin. The lower pole was much hollowed, and contained five instead of six stones, the sixth being found in an adjacent cavity. An oxalate of lime stone was found in the pelvis; it was firmly gripped by the pelvic mucous membrane, its front projection (the nose) blocked the ureter, and the one towards its posterior aspect (a boss) was tightly embraced by the mouth of a deep calyx, and the back pressure exerted by it had created a cyst which projected from the cortex of the lower middle third of the organ. The upper pole of the kidney was much dilated, but there was no true cyst projection, and there were no stones in this portion of the organ.

Now, what clinical and radiographic data gave me such confidence that I could draw exactly beforehand a condition of kidney which was unrecognizable to touch? Permit me to enumerate them.

The shadows in the left loin space of the radiograph are very sharp, and the man is young, therefore they are oxalate of lime stones (Rule 3). There is acid pyuria, hence they will have a slight coating of phosphate of lime (clinical rule).

The six isolated shadows are grouped near the mid-ileo-costal vertical (the mid-vertical line), hence I conclude they are in a calyx (Rule 8*), and as they are seen below the main large shadow, which must be a stone in the pelvis, they must be in a calyx of the lower pole. The shadows are clearly separate, hence there is fluid between them

* Rule 8.—Discrete shadows ranged along the mid-ileo-costal vertical (a line running vertically from the centre of the iliac crest-shadow to the rib, the lamp being mesial) usually denote stones in dilated calyx.

(Rule 11*), and thus I know the kidney is distended with fluid. The urine contains $\frac{1}{2}$ to $\frac{1}{4}$ pus acid and inodorous. I then know I have a hydro-pyonephrosis. A distended lower pole means ureteric block or pelvic outlet block; but when I notice a large dumb-bell shadow above the isolated collection I realize at once that this is a pelvic oxalate, and in order to produce distension of the kidney it must have a nose or projection upon it, and that this nose must be grasped firmly by the pelvic outlet. With such an extreme back pressure the upper pole nearly always suffers in the same way as the lower pole, hence I mark the upper pole as dilated. But how do I know there is a general distension? The shadows of the stone are well in the loin space, and not high up under the ribs; moreover, the kidney can be felt bimanually, and it is fixed, not mobile—therefore it is displaced. A displaced fixed kidney in a young man means a distended kidney (clinical rule). There are no shadows in the upper pole; hence no stones are in the upper pole. But how do I know that there is a cyst projecting from the cortex of the lower middle third? This is as easy of inference as the rest of the picture. I notice a boss projecting backwards on the stone shadow in the pelvis; clinically I recognize that the outer part of the dumb-bell must be tightly fitted in the mouth of a deep calyx. With such a tight fit there will be no exit for the urine in that calyx, and a cyst must be formed and must project.

The blackboard was photographed by Mr. Harnack, and the kidney was then drawn by Mr. Shiells (Fig. 3).

A Clinical Lecture ON CANCER OF THE OVARY.

DELIVERED AT MIDDLESEX HOSPITAL.

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In a lecture on secondary carcinoma of the ovary published in the *BRITISH MEDICAL JOURNAL* of May 26th, 1906, I recorded some cases which were thought to be primary carcinoma of the ovary, but on careful examination a primary focus was found either in the colon or in the breast. Since then some other examples have come under my observation which further support the views expressed in that lecture, and also the opinion I have long entertained that primary cancer of the ovary is a rare disease, and one concerning which we know very little. We cannot form an opinion on this matter simply by studying reports issued from pathological laboratories dealing merely with the histology of an ovarian tumour; it is necessary to combine such reports with the clinical observations, and especially a statement from the surgeon that in the course of the operation he made a careful examination of the gastro-intestinal tract and gall-bladder for a primary carcinoma. The most remarkable feature of these secondary masses in the ovaries is the dimensions they sometimes attain—so big, indeed, that they often rival a football in point of size, whilst the primary growth is so small and inconspicuous as to be overlooked unless the surgeon, suspecting the nature of the case, makes a special search for it. How easy it is to overlook a small primary cancer in the colon when masked by a large solid ovarian tumour is illustrated by the following case:

An emaciated woman, 64 years of age, was placed under my care in the Middlesex Hospital by Dr. Badcock, Gillingham, on account of a large abdominal tumour associated with threatened intestinal obstruction and vomiting. The tumour exceeded a football in size, the abdomen above the tumour was distended and the patient vomited the foul-smelling fluid met with in cases of intestinal obstruction. On vaginal examination a rounded lump the size of a cricket ball could be felt in the pelvis behind the uterus. The large tumour was quite hard and had grown rapidly. A careful consideration of the symptoms made it fairly clear that the vomiting indicated intestinal obstruction rather than peritonitis, and I came to the conclusion that the case was very probably an example of secondary cancer of the ovary associated with a primary cancer somewhere in the gastro-intestinal tract. The patient urgently needed relief. I operated in July, 1906, and succeeded in removing the large tumour which replaced the right ovary; the left ovary, enlarged to the size of a cricket ball, was also easily removed. As soon as the pedicles were secured, and the oozing stopped I made an examination of the intestines. The ileum was thrice its usual size and its walls thickened; this was due to a growth around the margins of the ileo-caecal valve which obstructed the communication between the ileum and the caecum. The growth was small, contracted, and so inconspicuous that unless I had made a careful search it would not have been detected. The patient was too ill to permit resection of the caecum, so I joined the ileum, about 50 cm. above its termination, to the middle of the ascending colon by a lateral anastomosis. The patient recovered from the operation, and thinking that she could not live long, arrangements were made to transfer her to the Cancer Asylum. In the course of six weeks the woman had improved so much in health and strength that she preferred to go home. I have since learned that she died in September, 1907, having survived the operation fourteen months.

The tumours were carefully examined in the Cancer Research Laboratories connected with the Middlesex Hospital, and found to be composed of carcinomatous masses derived from columnar epithelium. The sections were examined by several pathologists actively engaged in research work on malignant disease in general, and they had no doubt that the histological structure of the ovarian masses accorded with a primary mass arising in the colon. Of course the great defect in this case is my inability to produce microscopic evidence of the nature of the primary growth in the caecum, but this is due to the unexpected good consequence of the operation.

Concerning another patient recently under my care in the hospital I am able to give a complete account.

An urgent request was received to admit a single woman, 32 years of age, on account of acute abdominal pain. On admission the patient complained of frequent actions of the bowels and pain. Examination disclosed a large hard tumour in the belly reaching as high as the umbilicus; its lower end filled the pelvis. The uterus was mobile, and did not appear to be enlarged, but it was difficult to decide whether the tumour belonged to the uterus or not. The diarrhoea of which

the patient complained was spurious, and consisted mainly of mucus. I came to the conclusion that the tumour was too hard for a uterine fibroid, and I thought it might be an ovarian fibroid which had become impacted in the pelvis and obstructed the rectum. The patient was definite in her statements that the tumour had only attracted her attention during the last few months. Two days after her admission coeliotomy was performed and a big red tumour removed; in shape it resembled a huge kidney, and had replaced the right ovary; the surface of the tumour was beset with small

Fig. 1.—An ovary converted into a solid mass of carcinoma secondary to a focus of cancer in the sigmoid flexure of the colon. It weighed 5 lb.

* Rule 11.—Discrete cortical shadows when grouped together denote a calyx distended by fluid, either urine or thin puriform urine.

TO ILLUSTRATE MR. HURRY FENWICK'S PAPER ON RADIOGRAPHY IN STONE IN THE KIDNEY.

Fig. 1.—Blackboard sketch of kidney made before operation.

Fig. 3.—Section of kidney removed showing stones and cystic dilatation.

Fig. 2.—Radiograph showing stones of kidney.