lar inflammation of which I am speaking. Portions are bright or deep red, and rough; other parts are paler and smooth; except in the severe cases, where we find no healthy portions of mucous membrane.

I have mentioned that I have seen a few cases in which the os uteri was not more open than usual, and in which I ascertained that granular inflammation existed. In such cases, I have observed that the introduction of the sound in the gentlest manner caused some bleeding, or, in other cases, gave actual pain. If, in such cases, the canal be dilated with a tangle tent, its granular condition may at once be ascertained; so that I regard these two symptoms—slight bleeding or pain when the sound is passed very gently—as conclusive. Reasoning *à priori*, I think we should expect to find the canal narrowed or closed, as the ordinary result of granular inflammation; but the opposite is the case in the vast majority of instances. Nor am I able to offer any scientific explanation; all I know is the fact, that of this disease the most unvarying accompaniment is an os uteri unusually patulous.

I have been thus particular in describing the anatomico-pathological peculiarities of the disease, because, as one might expect, the symptoms (properly so-called) are less distinctive, but have much in common with other affections of the uterus. There may be, and generally is, the usual aching pain in the back, with, possibly, some feeling of weight or bearing down. The menstrual flow is almost always increased, sometimes excessive, or recurring at short intervals and from slight causes. I recollect only one case where the opposite extreme was observed. There is always more or less leucorrhoeal discharge, thinner, and white or yellowish, if there be vaginitis; thick and tenacious when the disease is limited to the canal of the cervix. When the speculum is used, we may see this stringy discharge hanging out of the os uteri, and it is sometimes difficult to remove it. When the disease is of long standing, it interferes, more or less, with the general health, giving rise to languor, listlessness, loss of appetite, and imperfect digestion. In addition, it is not less potent than other disorders of the uterus in exciting reflex irritation, of which, perhaps, the most common is ovarian pain and irritability of the bladder; very distressing while they last, but not absolutely requiring any special treatment beyond a vaginal suppository of belladonna or morphia, and which disappear as the cure of the disease progresses.

Upon one uterine function, gestation, the influence of a severe attack of granular inflammation is apt to be disastrous. It does not always prevent conception; but, in a great number of cases, it causes abortion. I have known a succession of miscarriages apparently result from this cause alone; and I think that, in all cases of the disease, no risk of impregnation should be incurred. It will be wise also, in any case of abortion, to examine into the condition of the canal after the lochial discharge has ceased.

DIAGNOSIS. After what I have already said, I need occupy very little time with the diagnosis. Our suspicions will probably be first excited, when making a digital examination, by finding the point of the finger pass more or less freely into the os uteri, and the inference from this will be turned into certainty by a sunlight or endoscopic investigation. A little longer process will be necessary when the os is not patulous; the occurrence of pain when the sound is passed, or a drop of blood escaping afterwards, leave but little doubt, and that may be removed by dilating the os with tangle, and a subsequent careful examination.

TREATMENT. The disease is curable enough, and the course of cure steady but slow. It must be for such cases that the different kinds of curette have been invented, to scrape off the granulations. This does not appear a very scientific procedure, and I am sure you can cure this disease as effectually without it. The endoscope affords us a very nice and precise mode of applying remedies to any part, either of the cavity of the uterus or the canal of the cervix, without the risk of doing more than we intend, so that we may safely use stronger remedies than we dare in any other way. By this means, strong nitric acid, tincture of iodine, or lunar caustic, may be applied when we please, and to a greater or less surface as may be necessary, or if we wish to limit our treatment to the cervical canal, a smooth piece of deal may be dipped in the acid or the tincture, and freely applied. I have found it better to begin with a free application of strong nitric acid, so as to destroy the granular surface, and this may be repeated at intervals of three or four days, until we obtain a smooth surface. The vagina should be syringed with cold water, or camomile tea, once or twice a day. After this, I dip a small twist of cotton-wool in tincture of iodine, and apply it to the entire diseased surface, twice a week, continuing the syringing as before. As the cure progresses, the lining membrane becomes paler and smooth, and the os uteri closes somewhat, but it is not restored to its natural size for some time. I have found a strong astringent applied to the inner surface, in the way I have described, the best aid, and with this view I have used with benefit both the pernitrate and perchloride of iron, at the same time syringing the vagina with a strong astringent.

I should strongly advise "separation" until the treatment is finished, as conception might seriously interfere with our procedure.

There is a disease which I meet with occasionally, which may possibly have some relation to the foregoing, but of this I am not sure. I mean a vascular tumour at the os uteri, exactly like that we find at the meatus urinarius. It varies in size from a pin's head to a raspberry, and, unlike the small polypi found in the same situation, bleeds on the slightest touch. So far as I know, it gives rise to no symptoms but menorrhagia. It can seldom be recognised by the touch, because of its small size and softness, but it is easily detected by the speculum. The cure is simple—excision by scissors, or Dr. Braxton Hicks's small wire *écraseur*, or torsion by Wilde's snare, and, subsequently, repeated cauterisation.

THREE CASES OF SPONTANEOUS FRACTURE OF URINARY CALCULI IN THE BLADDER.

By GEORGE SOUTHAM, F.R.C.S.,
Surgeon to the Manchester Royal Infirmary.

THE rare occurrence of the spontaneous fracture of an urinary calculus has induced me to submit to the members of this Association the following cases, two of which came under my own notice; the other under that of Mr. Luke, to whom I am indebted for the particulars.

The first case is that of a boy named Hilton, aged 15 years, who was admitted a patient of the Manchester Royal Infirmary in 1855, with the usual symptoms of stone, from which he had been suffering for about eighteen months. He had been sounded on one occasion only, but without the detection of a calculus. I ordered him to keep his bed two days, at the expiration of which time, by the introduction of a sound, I readily discovered the existence of a stone. At the end of seven days, I made an attempt to remove it by the lateral operation; but the catheter, which was introduced for the purpose of injecting some fluid into the bladder, could not be passed beyond the prostatic portion of the urethra, as the calculus was firmly fixed in that part. The instrument was, therefore, withdrawn; and, with the finger passed into the rectum, and the calculus being pressed against the perinæum, a portion of it was extracted through an incision which I made into the urethra, of about three-quarters of an inch in extent, in a line with the raphe. The remainder and larger fragment, which was in the bladder, was removed by a pair of long forceps. The case progressed most favourably. The calculus consisted of two portions, one considerably larger than the other. The smaller stone (Fig. 1), which was situated in the urethra,

Fig. 1.

had the appearance of having been recently broken off from the larger, except that the edges had lost their sharpness. The surface of the larger portion (Fig. 2) showed that the fracture was not of recent date; for a quantity of triple phosphate was deposited on its broken side and

Fig. 2.

prevented the two pieces, with the exception of their edges, from corresponding with each other. The calculus was composed principally of lithic acid, coated with so thick a covering of oxalate of lime, that considerable force would have been required to break it. The weight of the entire calculus is 6 drachms, the smaller fragment being 70 grains.

The second case to which I beg to call your attention is that of a boy aged 7 years. He also was under my care as a hospital patient in 1863.

The calculus consisted of two portions, one consisting chiefly of a part of the outer covering of the stone, which was also found partially encysted in the prostatic portion of the urethra. It formed, however, no obstacle to the introduction of the catheter or staff; but, during the operation, it obstructed the passage of the knife into the bladder, and had to be removed with a pair of forceps. With this exception, I experienced no difficulty in the operation, and the boy made an excellent recovery. Notwithstanding the absence of any recent deposit on the smaller fragment, its edges were smooth, and showed that the fracture must have taken place at some remote date. The appearance of the calculus itself confirmed this view; for it was so encased with phosphates, that it was difficult to discover where the other portion was originally attached until a section of it had been made. The entire calculus weighs 2 drachms 15 grains; the smaller fragment, 10 grains.

The subject of Mr. Luke's case was a man in his sixty-fourth year. He was admitted into the London Hospital in September 1855, with the usual symptoms of stone. A catheter was introduced into the bladder, and struck against a soft and apparently large calculus. An attempt was made to crush the stone; which, however, was so large as to slip once or twice from between the blades of the lithotrite without any apparent effect. Lithotomy was afterwards performed; and a large soft stone, in the shape of a wedge (Fig. 3), having one rounded surface and two smooth facets, was removed, from which it was inferred that there were two more calculi in the bladder. The forceps were, therefore, again introduced, and another stone seized, which broke into several

Figs. 3 and 4.

pieces (Fig. 4). On placing the fragments in their original position, the stone proved to be precisely similar in shape to the first, and about the same magnitude. The facets of each were found to correspond so exactly, that they must have folded upon one another in the various movements of the bladder, for no other stone was discovered. They were both composed of triple phosphate.

REMARKS.—Phosphatic and other concretions, having the appearance of portions of calculi, are frequently passed without surgical interference. In many cases, the concretions evidently are only secretions from disease of the mucous coat of the bladder; but occasionally distinct portions of the nuclei of calculi are found incorporated with the soft friable phosphatic materials, showing the existence of more than one stone in the bladder at the same time. Their being passed during the administration of remedies has been supposed to prove their solvent power; but, except in cases where the concretions are undoubtedly the products of a diseased bladder, there has generally been sufficient evidence to prove that the fragments have been detached from more than one calculus. Hence we may fairly infer that their disruption is to be attributed to the stones striking against each other through certain movements of the body, or to their compression by the action of the muscular coats of the bladder. This view is confirmed by a case recorded by Mr. Liston, of a medical man who had laboured under the symptoms of stone for a considerable period. Being suddenly called to an urgent case of midwifery, he ran quickly down a steep street, and, as soon as he reached the bottom, was seized with a strong desire to pass urine, which he did, but only in small quantity, mixed with blood. Some pieces of stone, with sharp angles, were voided; retention of urine supervened, and the urethra became much obstructed; suppression followed; and, after a few days of excruciating agony, death terminated his sufferings. On post

mortem examination, numerous fragments of calculi were discovered in the bladder and urinary passages. (*Elements of Surgery*, p. 638, 1840.)

In each of the cases I have brought forward, there being clear evidence that there was but one calculus, we must look for other causes of the fractures. Not only were they single, but, at the time of the fracture, two of them were composed almost entirely of lithic acid and oxalate of lime—materials not likely to be affected by any degree of force which might be applied to them in the movements of the body or from the action of the muscles of the bladder. As the calculus in Mr. Luke's case was composed chiefly of triple phosphate, the lithotrite may possibly have contributed to its fracture, although there is no evidence to that effect; but in the other two, though each patient had been sounded before he came under my care, the stone had not been detected. Nor could any injury have led to their fracture from my examination, for their structure was too compact to be affected by the sound; and, moreover, their surfaces plainly show they must have been broken some weeks at least before I discovered them. The cause of their fracture must, therefore, be sought in the calculi themselves. It may probably have taken place through the generation of some gaseous agent, from chemical changes in their earthy constituents; or through the decomposition of the animal mucus of which their cementing material is formed, and which exists in various quantities in different calculi. This view seems to be confirmed by the appearance sometimes, though rarely ob-

Fig. 5.

served in calculi where the fracture is limited to the internal layers, of which there are two excellent specimens in the Dupuytren Museum at Paris, the separated portion of one appearing to have become again cemented together, and encrusted with a subsequent deposit. (Fig. 5.)

ON A CASE OF ABDOMINAL ANEURISM WITH DICROTIC PULSE.

By WILLOUGHBY FRANCIS WADE, B.A., M.B.,
Physician to the General Hospital, Birmingham.

A GLASS-CUTTER, aged 30, with a history of syphilis ten years previously, was found to have abdominal aneurism. His gums showed the blue line of plumbism common in his trade. His first symptoms were characteristic pains in the back and belly. The tumour was of vast size, with two murmurs, one merging into the other without any interval of silence. The first murmur was heard over the whole sac, and was attended by marked thrill at the site of the aneurismo-arterial opening. To this spot the second murmur was limited. He died, after a year's illness, from the sac opening into the left lung.

POST MORTEM EXAMINATION.—The aneurism occupied almost the whole left half of the abdomen and the lower third of the left chest. Some vertebræ were eroded. The sac contained much old and recent clot. The aneurismo-arterial orifice had smooth rounded edges, and was about three inches long by two wide. The heart was normal.

The case was under the care of my senior colleague, Dr. Evans, who has kindly allowed me to make use of it. Annexed is a woodcut of the right radial pulse-trace.

My space being very limited, I propose to pass by all other considerations, and endeavour to show what I believe to be the true explanation of the extraordinary dicrotism (c).

It has long been known that a single contraction of the left ventricle may produce two beats of the pulse. To this phenomenon, the term "dicrotism" has been applied (*δικροτος*, double-beating); *bis feriens* is its Latin synonym. This kind of pulse has been generally found in