regional incision according a good exposure to one or other of the following sections of the ureter:

1. Abdominal section.
2. Parietal section of the pelvic ureter.
3. Visceral section of the pelvic ureter.

Under these numbers I will briefly allude to the operations I have myself used.

1. *For Stone in the Abdominal Ureter.*—An oblique lumbo-iliac incision extending from just below the twelfth rib in the angle which it forms with the erector spinae, passing obliquely downwards about one inch internal to the anterior superior iliac spine, then inclining forwards parallel to Poupart's ligament as far as the rectus is required. The muscles are then divided in this line to the peritoneum. The peritoneum is retracted inwards, pulling the ureter with it, but the latter can be comparatively easily isolated.

2. *For Stone in the Parietal Portion of the Pelvic Ureter.*—A McBurney incision lengthened some inches as suggested by Thelwall Thomas; the muscles are split to the required extent and forcibly retracted. The peritoneum is then exposed and stripped upwards until the ureter is seen crossing the iliac vessels.

3. *For Stone in the Visceral Portion of the Pelvic Ureter.*—A median abdominal incision, as described by Judd⁷ will be found satisfactory. Starting from just below the umbilicus and extending to the pubis, the recti are retracted, and the peritoneum well exposed and pushed upwards by gauze dissection. The bladder is then pulled out of the wound as far as possible, and towards the side opposite to that in which the stone is located. By this means the ureter can be seen in its lowest part. An equally good exposure can be obtained by Kelly's modification of the Pfannenstiel incision.

And now a few words of warning. The search for ureteral stones is by no means always successful. The surgeon may fail to find the stone, or perhaps, what is more disappointing still, he may find the stone and be unable to extract it. This has happened to me on two occasions after prolonged operations. In one instance where I had used Thomas's incision a stone was found impacted just outside the bladder wall. The ureter was opened above and the fine forceps (Desjardin's) passed down to it, but every endeavour to grasp it failed. A small flexible scoop was then used to try and dislodge it, without success. Finally, I was able to push it forward with the Desjardin's searcher and a long probe. The ureteral incision was closed with catgut, a small rubber drain inserted, and the wound rapidly closed.

The other case was even more trying. I had used Judd's incision. The position of the stone was found after great difficulty, and could just be felt outside the bladder wall. I could not get a good exposure to see what I was doing, partly on account of general oozing and partly owing to the depth of the wound. Moreover, the ureter was so small that it would not have taken my extracting forceps. As a last resort I opened the peritoneum and inserting a finger hooked the base of the bladder and ureter forward, and, working with another finger in the wound, I was able to milk the stone onwards to the bladder.

These two cases were extremely tedious and trying, but despite the disappointment to both the patients and myself at not being able to see the stone after the operation, they had the satisfaction of voiding it without much difficulty a few days later, and made a speedy and complete recovery. I myself was equally pleased that these simpler measures were more than justified. I hesitate now to think what might have happened had I persisted in making more heroic efforts. The mortality is said to vary from 15 to 20 per cent. with such open operations, not so much from the operation itself as from the after-effects, such as persistent suppuration, fistula formation, thrombosis of the iliac vessels, embolism and even gangrene of the lower extremity, which have been recorded. My own personal experience is that the open operation for stone in the lower ureter may be one of extreme difficulty, not to say danger, more especially should the surgeon, in his intense desire to demonstrate a stone, proceed to slit up a ureter recklessly or combine an intravesical operation after an extensive extraperitoneal dissection, and these dangers are again multiplied with the presence of an infected urine. To corroborate this I

will simply quote Deaver,⁸ who says that the operation for the removal of a calculus situated low down in the ureter may be one of the most difficult undertaken.

I have here purposely insisted on the difficulties of the surgery of the lower ureter, because I believe less hazardous operations are being undertaken with more than encouraging success. I refer to the use of the operating cystoscope, such as the later models of the American type of Buerger and Bransford Lewis.⁹ The procedure with this plan and equipment undoubtedly requires a careful technique and no mean skill, but this should be acquired by the surgeon attempting these cases, and from its comparative harmlessness, it is to be commended in the future as a first step before resorting to the more serious open operation.

My best thanks are due to Dr. Crump for his excellent radiographs; to my house-surgeon, Mr. G. Stevenson, for getting together notes of the cases and assistance with the diagrams; and finally, to Mr. Noel H. Leaver, A.R.C.A., for the trouble he has taken in converting crude drawings into finished diagrams.

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THE MORTALITY OF APPENDICITIS.

BY

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In the opening sentences of his interesting article on "Acute Appendicular Obstruction," which appeared in your issue of April 3rd, Mr. S. T. Irwin says that the mortality of this disease "under modern scientific treatment still runs to from 5 to 25 per cent., according to its type." This, if true, ought not to be, and even in these busy times must not be allowed to pass without comment.

I quite admit in some of the worst cases the mortality may be even higher than 25 per cent., but I am satisfied, as the result of the experience of the last fifteen years, that the over all mortality should not reach more than 5 per cent., and that if the disease is treated by operation sufficiently early the mortality of acute cases need not be more than 1 or 2 per cent. There is nothing inherently dangerous about appendicitis—it is for the most part a question of the extent of peritoneal involvement and of the stage at which interference is carried out.

If, in the practice of any large general hospital or individual surgeon, the over all mortality is higher than 5 per cent., there is some fault either with the surgeon, the contributing doctors, or the public. I must at once say that the better results which we have obtained in this district during the last ten years are largely due to the promptness with which practitioners in our contributing area send their patients for operation. At the present time over 60 per cent. of the cases reach us while the inflammation is still limited to the neighbourhood of the appendix (Groups 1, 2 and 3), while ten years ago it was exactly the reverse. This is well brought out in Table 1, showing the grouping of my cases for last year:

TABLE I.

		Cases.	Deaths.
Group 1	Acute appendicitis without peritonitis	10	0
Group 2	Acute appendicitis with localized peritonitis	47	0
Group 3	Acute appendicitis with flank or pelvic peritonitis or both	19	1
Group 4	Acute appendicitis with diffuse peritonitis	13	1
Group 5	Appendicitis with residual abscess	7	
Group 6	Appendicitis with primary localized abscess	27	2
Group 7	Appendicitis—interval removal	58	0
		181	5 (2.76%)

The campaign on the early surgical treatment of acute abdominal emergencies started and persistently carried on by Professor Rutherford Morison has certainly borne good fruit with us, and that surgeon deserves the greatest credit for his work.

During the last ten years there have been treated in the wards of the Newcastle-upon-Tyne Royal Infirmary a total of 3,951 cases of appendicitis with an over all mortality of 5.41 per cent. Naturally I am especially interested in my own figures, and Table II sets out the total number of cases operated upon by me since I first commenced to practise surgery, and up to the end of last year.

My practice is to operate on practically every case of appendicitis that comes under my care. For a time cases of general septic peritonitis with distension were not operated upon, but I now nearly always make a small incision or incisions for drainage only, the removal of the appendix being left to a later date. In cases that are in an extremely toxic state when first seen I may deem it wise to wait for twenty-four hours, until the bowels have been got to move, and until a greater or lesser amount of saline has been absorbed, and in cases of localized abscess I may defer the operation for from twelve to twenty-four hours as a matter of convenience. In all other cases the operation is carried out as soon as possible.

I attach great importance to the use of ether administered by the open method; to a proper exposure by the oblique muscle cutting incision of Rutherford Morison;¹ to saline given by intermittent rectal injection or by subcutaneous infusion, and to the early evacuation of the bowels. In almost every case the appendix is removed as an essential part of the operation. As junior assistant surgeon up till a few months ago I was not in a position to hand patients on, and the tables therefore show the results in a consecutive series of unselected cases of appendicitis extending over a period of about a dozen years.

TABLE II.

Year.	Total Cases.	Deaths.	Percentage.
Previous to 1907	66*	8	12.00
1907	68	8	11.76
1908	89	7	7.86
1909	102	3	2.94
1910	107	2	1.86
1911	131	5	3.81
1912	118	2	1.69
1913	143	7	4.89
1914	181	5	2.76
Total	1,005	47	4.67

* The figures for this year were published in a letter in the *BRITISH MEDICAL JOURNAL*, in the issue of July 20th, 1912, and the total number of cases for this period given as 64. Since then the figures have been carefully scrutinized, necessitating the addition of 2 cases.

But the most interesting statistics are those furnished by grouping the cases, as in Table III, for it shows that when cases of acute appendicitis are operated upon before infection of the peritoneum has become extensive (Groups 1, 2, and 3—389 cases with 10 deaths) it is possible to keep the mortality as low as 2.57 per cent.

TABLE III.

	Cases.	Deaths.	Percentage.
Group 1 Acute appendicitis without peritonitis	62	0	—
Group 2 Acute appendicitis with localized peritonitis	219	3	1.36
Group 3 Acute appendicitis with flank or pelvic peritonitis or both	108	7	6.48
Group 4 Acute appendicitis with diffuse peritonitis	57	19	33.0
Group 5 Appendicitis with residual abscess	49	5	10.20
Group 6 Appendicitis with primary localized abscess	241	9	3.77
Group 7 Appendicitis—interval removal	257	0	—
Group 8 Appendicitis with primary complications	12	4	33.0
Total	1,005	47	4.67

In the above table the cases in Group 8 include such complications as intestinal obstruction and pylephlebitis. In Groups 3, 4, 5, and 6 a considerable number of secondary operations have been necessary for pelvic or other secondary abscesses, intestinal obstruction, faecal fistula, secondary haemorrhage, and empyema. Other complications, as pneumonia and acetonuria, have also occurred, and as every kind of case is included the list shows the mortality of appendicitis together with its complications. Although each case is only counted once some of the worst varieties have necessitated multiple operations. The following are typical examples:

R. C. (Reg. No. 3744), aged 16, Group 5, was admitted to hospital on September 2nd, 1910, with a pelvic abscess, the result of a localizing general peritonitis. This was opened per rectum on the day of admission. On September 6th a large abscess in the hepatic pouch was incised. The boy slowly improved, though a faecal fistula developed through the incision in the right iliac fossa. On October 12th he developed acute intestinal obstruction necessitating a median laparotomy below the umbilicus, a band being found and divided. On November 4th the appendix was removed and a large hole in the caecum closed, but it was not until January 4th, 1911, that he was well enough to be sent home.

J. F. (Reg. No. 5733), aged 44, Group 5, was admitted very ill with a large abscess in the right iliac fossa, the result of a localizing general peritonitis. On May 11th the abscess was opened and drained. On the 23rd a large subphrenic collection was similarly dealt with, and on the 31st an empyema on the right side required incision. After this operation he did very well for a time, but on June 3rd acute intestinal obstruction developed necessitating laparotomy. When recovery seemed almost assured pylephlebitis supervened and led to the death of the patient on July 19th.

In surgery, as in common affairs of life, ideals are necessary, and so far as my experience goes the higher they have been the greater the benefits conferred. Nothing is worse than an attitude of complacency, and the profession must not be content with a mortality of even 5 per cent. in appendicitis. When this disease is always treated by the early surgical interference which it demands there is no reason why the mortality ought not to be as low as the 1 or 2 per cent. represented by operations conducted in the earliest stages—nay, barring occasional accidents, mortality from this disease might nearly vanish if the profession and public both realized that the only treatment is by operation.

REFERENCE.

¹ *Lancet*, February 23rd, 1901.

A CASE OF CEREBRO-SPINAL FEVER SIMULATING ACUTE NEPHRITIS WITH URAEMIC CONVULSIONS.

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THE following case is interesting in that at first it closely simulated acute nephritis, and in addition had a curious onset. The case was the only one that occurred in the particular area occupied by the unit.

The medical officer was called at noon to see Private H. in his billet. He said that at 4 a.m. he had awakened with "pain in the calves" and both loins, and found he had lost the use of his legs to the extent that he could not stand up. On the arrival of the medical officer he woke up from a slumber. The expression of his face during the beginning of his account of his illness indicated that very little would have produced a flow of tears. He was distinctly deaf. A history of a slight cold in the head for a few days suggested that his unusual deafness might have been due to catarrh extending up the Eustachian tubes, but the absence of pain or noises or sensation of fullness in the ears, coupled with the subsequent history, make it more than likely that this was due to the commencing meningitis. He said that his slight cough caused intense pain in the head each time, but that otherwise he had no headache though his head felt "heavy." He had not passed urine since the previous afternoon, and complained of great thirst. His face was distinctly puffy all over, including the eyelids. The non-commissioned officer present informed the medical officer that this was so marked that he could scarcely recognize him. The man was a moderate beer drinker. He complained of no sore throat and had not vomited; the temperature was 101° F. and the pulse 105; the tongue looked very dry, and was coated with a dirty brown fur; there was no rash. Nothing of note was found in