the simple experiment of adding blood to urine and then counting the cells, that all methods of testing for blood other than microscopic are not only valueless, but a positive source of deception. The guaiac test for blood is hardly ever positive unless the urine is red in colour, and experiment has shown that more than 10,000 red blood corpuscles must be present per c.mm. before this point is reached. The pyramidon and benzidine and spectroscopic tests are only positive when the urine is either obviously red or has a "smoky" tint, "smokiness" being reached only when the urine contains at least 1,000 red blood corpuscles per c.mm. When less than 1,000 red blood cells are present per c.mm. no test other than the microscope will show the presence of blood. On the other hand, the cell count method may be relied on when such small quantities of blood as 10 red blood cells or even less are present per c.mm. The delicacy of the cell count method is revealed when these facts are presented in an example. A specimen of urine containing about 800 to 900 red blood corpuscles per c.mm. would show no smokiness and no trace of blood to the naked eye, and the guaiac, benzidine, and spectroscopic tests might all be negative, and yet the presence of blood would be indisputably demonstrated by the cell count method *after the urine had been diluted more than one hundred times.*

Practical Points.

The specimen of urine to be examined should be the first passed in the morning, and the patient should be instructed to pass the urine direct into a wide-mouthed bottle, or into a clean receptacle from which it is to be transferred at once to a clean bottle. The figures given above are based on early morning specimens; lower counts are obtained if a specimen is collected only an hour or two after the bladder has been emptied and the patient has taken a lot of fluid. Specimens may be accepted if an interval of more than four hours has passed since the last micturition, but in all doubtful cases the early morning specimen must be insisted on. The urine should be examined on the day on which it is passed.

Turbid Urines.

Urines need not be clear from crystalline or amorphous deposit of inorganic salts, but if these are dense accurate counting becomes impossible. A cloud of phosphates may be quickly dispelled by a drop of acetic acid. A deposit of urates and oxalates cannot be easily removed by any chemicals, but urine turbid from this cause usually becomes quite clear by dilution with an equal volume of warm water.

Recognition of Leucocytes.

Only round cells of the size and shape of leucocytes must be counted. Until the eye has become trained to

FIG. 2.—Field of view obtained with 8 mm. objective and $\times 10$ eyepiece, enclosing four $\frac{1}{4}$ mm. squares, reduced for reproduction to one-fifth of the size actually seen. Red blood corpuscles in upper left-hand square and leucocytes in lower right-hand square.

red blood cells have been drawn to scale, and in the lower right-hand square leucocytes. An impression of the relative size of things can be obtained by recollecting that each of these smallest squares is bounded by lines 250 microns in length. Red blood cells in urine usually measure 8 to 9 microns in diameter, a little less than $\frac{1}{25}$ of the boundary

line, and leucocytes usually measure 10 to 12 microns, a little more than $\frac{1}{25}$ of the boundary line.

Epithelial cells must not be included in the count. These are usually larger, often irregular in outline, with a relatively small conspicuous nucleus. Squamous cells are easily distinguished and disregarded; caudate cells with a tail-like prolongation of the body, and pear-shaped cells, usually attributed to the renal pelvis or neck of the bladder, must not be included in the count. In judging whether or not a cell should be counted as a leucocyte special attention should be paid to the size, the definite rounded outline, and the presence of a nucleus. The recognition of a leucocyte is an accomplishment that becomes progressively easier with experience. No advantage is gained by trying to stain the cells, and the so-called differential stains purporting to distinguish epithelium from blood cells are unreliable. Acidifying with acetic acid makes the cell nuclei more conspicuous, but with experience in the counting of leucocytes even this simple step is usually unnecessary.

Recognition of Red Blood Cells.

Red blood corpuscles are more difficult to distinguish than leucocytes, and it is well before attempting to count erythrocytes to become familiar with the shapes they may assume, whether the disc is viewed through the centre or periphery. Accurate measurements are necessary in doubtful cases.

Storing of Apparatus.

After use the slide and cover-glass are conveniently disinfected and stored in methylated spirit. The glass pipette should be well rinsed out with water and stored standing in a test tube containing 1 per cent. formalin. After use for a urine containing much pus the pipette should be boiled or thrown away. The pipettes are made by drawing out glass tubing in the blowpipe flame, and it is useful to have about a dozen at hand.

Summary.

The most accurate method of determining whether or not pus is present in urine is to count the leucocytes in a chamber similar to that used for counting the cells in cerebro-spinal fluid. The sample to be tested must be the first urine passed in the morning or after an interval of four hours. The test can be completed in two or three minutes, and provides a quantitative record comparable from day to day. It is suggested that no urine should be said to contain pus unless it contains more than 100 leucocytes per c.mm.

SARCOMA OF THE STOMACH.

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THE following case presents so many features of interest, apart from the extreme rarity of the condition, that it seems worthy of record. Most of the surgical authorities consulted either make no reference to the incidence of this type of growth or else quote it as a "rare pathological curiosity." In this instance the only practitioner to diagnose the case as one of malignancy was the anaesthetist, who was not acquainted with the physical signs or the clinical history.

A man, aged 40, was first admitted to the Victoria Hospital, Deal, on April 14th, 1927, under my colleague the late Dr. F. M. S. Hulke. The diagnosis made on admission was chronic duodenal ulcer. The history was typical: pain an hour or two after food, slightly relieved by food, melaena, some wasting. A skiagram after a barium meal confirmed this diagnosis. There was a rapidly acting stomach with considerable deformity of the duodenal cap, no filling defects, no sign of crater in the lesser curvature, and, to complete the picture, an apparent duodenal ileus.

Dr. Hulke commenced medical treatment, and the results were excellent. The patient put on weight, a stone or more, regained his healthy appearance, and was discharged fit a month later. After three months of rather strenuous work he came to consult me with a view to operative treatment of his condition. His previous good health had disappeared, he was emaciated, had frequent vomiting, and melaena with a good deal of pain and discomfort. He was therefore readmitted to hospital on August 15th for a preliminary course of rest and dieting, as his condition was too poor to risk immediate operation. During the following

week he had so much tenderness and rigidity in his epigastrium that no tumour could be felt. After the first week he was considerably better; the vomiting and melaena had ceased.

Operation.—On August 22nd he was taken to the theatre with a view to removing the appendix and performing duodeno-jejuno-stomy. Under general anaesthesia a movable epigastric tumour, about 4 inches in diameter, was felt through the abdominal wall and explored through a right paramedian incision. It proved to be a growth of the middle of the stomach, slightly adherent to the pancreas, with multiple glands in the gastro-hepatic and gastro-colic omenta. I removed the growth with the enlarged glands and a small portion of pancreas by the modified Polya method, leaving about a quarter of the cardiac end of the stomach to anastomose to the side of the jejunum. Convalescence was uneventful.

Macroscopically the stomach showed two large ulcers about 2 inches in diameter, facing each other on the anterior and posterior walls, with very thick heaped-up edges and obvious neoplasms in their bases. A section of one was sent to a pathologist, who reported as follows: "This is a difficult specimen about which I felt doubtful. A second opinion I obtained was given as follows: 'The gastric wall is occupied by small polygonal cells of connective tissue type and oat-shaped form. Being almost absolutely uniform in character, without admixture with chronic inflammatory cells, the condition cannot be related to a hyperplastic gastritis or leather bottle condition. The diagnosis would be spindle-celled sarcoma.' I hesitate to accept this diagnosis as the condition would be extremely rare, and I think there are other possibilities. Without knowing anything of the clinical condition, I do not care to express a definite opinion."

Having fortunately preserved the specimen I forwarded a section of the growth from the other ulcer and an enlarged gland. A second report read: "This is evidently a deposit of small rounded sarcoma which has become ulcerated, a very rare condition. The gland does not appear to be affected."

The patient was seen again four months after the above account was written; he had then gained 2 st. in weight and all signs of malignancy had disappeared.

From a surgical point of view one would certainly say from the specimen that the sarcoma supervened upon chronic ulceration, but that is a pathological point I am not qualified to dispute.

The salient points of the case are rather remarkable—the clinical evidence of duodenal ulcer, the condition found at operation, and the points against malignancy, especially the considerable improvement after rest and diet. I have no information as to the prognosis of these cases, if, indeed, any have been operated upon before.

I would like to express my thanks to Dr. Ponder for the pains he has taken to give me an accurate statement of the microscopical condition of the growth.

Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

MECKEL'S DIVERTICULUM IN STRANGULATED INGUINAL HERNIA.

THE following case, in which a Meckel's diverticulum was found in a strangulated inguinal hernia, seems worthy of record.

A married woman, aged 66, was admitted to the Royal Infirmary, Liverpool, in October, 1927, with a history of having been acutely ill for three days with a lump in the right groin, abdominal pain, and vomiting; strangulated inguinal hernia was diagnosed. There was a tender, tense, rounded swelling at the lower end of the right inguinal canal; the skin moved freely over it, and there were no signs of inflammation of the cutaneous tissues. The patient stated that she had had a rupture for some years, and that three days before admission, while exerting herself, a sudden severe pain had appeared in the groin, causing her to vomit.

On opening the sac some sanguineous fluid escaped, and a tube was discovered about three inches long, and intensely congested at its distal end. This tube had a small mesentery, and at first sight I took it to be the appendix. On pulling out the portion of bowel to which it was attached, however, a loop of small intestine presented instead of the caecum. After ligaturing and dividing the mesentery (or meso-diverticulum) the tube was clamped at its base, the stump invaginated, and the loop of small intestine returned to the abdomen. The sac was removed in the usual way and the inguinal canal repaired.

The patient made an uninterrupted recovery and no complications have arisen since.

Pathological examination of the tube showed the structure to be typical of a Meckel's diverticulum.

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UNUSUAL COMPLICATIONS OF PNEUMONIA.

IN view of the exceptional symptoms, course, and complications the following case of pneumonia appears to be worthy of record.

A man, aged 65, when first seen complained of backache, slight headache, and "cold chills." He had not had a rigor, and did not look very ill. His tongue was very dry and red; the pulse was 100, the respirations 20, and the temperature 101.5° F. Physical examination was negative. The next day he had a slight cough, with a little yellow sputum. The chest was resonant, with a few râles at both bases. He had no pain. On the third day the cough had almost gone and the general condition was the same. On the fourth day he had severe hiccup, which continued almost without pause for two days. He also had slight conjunctival jaundice. On the fifth day jaundice became very deep over the whole body, and the abdomen was greatly distended, though no cause was found. The patient passed a small, soft yellow stool, and the urine was markedly haemorrhagic. On the sixth day the jaundice was much less marked; the cough returned, and there was a suspicion of bronchial breathing at the base of the right lung. The pulse was 110, the respirations 30, and the temperature 103° F. The abdomen was still greatly distended, and on this day a hard, globular swelling about the size of an orange was noted in the left iliac fossa. This had a clear edge below, but the upper margin was ill defined; there was a resonant note over it, and it did not move on respiration.

The diagnosis up to now had been influenza with mild bronchitis, and later early pneumonia, possibly. The jaundice presented a difficulty, but was recognized as occurring rarely in influenza. The distension was attributed to a condition of paralytic ileus due to profound toxæmia. The lump could not be explained, and was the chief difficulty.

Dr. J. H. Thornley, honorary surgeon to the Scarborough Hospital, saw the case in consultation, and agreed to take the man into hospital. During the following day the patient became gradually much worse, and died that evening with definite signs of a right-sided pneumonia.

At the necropsy marked pneumonia was found in the lower lobe of the right lung; the heart contained *ante-mortem* clot. There was no lump within the abdomen, but a large haematoma was present in the abdominal wall.

The unusual points in this case are: (1) The huge haematoma. I cannot find a record of this occurring in the abdominal muscles during influenza and pneumonia. I would suggest that the cause was thrombosis of a vessel in the abdominal wall. (2) The marked jaundice.

I am indebted to Dr. Thornley for the later history of the man, for the necropsy findings, and for helpful suggestions generally.

Scarborough.

N. WALSH, M.B., Ch.B. Leeds.

Reports of Societies.

ANAESTHETICS IN OBSTETRICS.

At a joint meeting of the Sections of Anaesthetics and Obstetrics of the Royal Society of Medicine on March 2nd, with Dr. CECIL HUGHES, president of the Section of Anaesthetics, in the chair, a discussion was held on anaesthetics in obstetrics.

Mr. EARDLEY HOLLAND, opening the discussion from the obstetric standpoint, said that he was glad to see that anaesthetists were beginning to take an interest in a department of their art which hitherto they had almost neglected. The requirements of the obstetrician were that the anaesthetic should be simple and safe in administration, and capable of being used by those inexperienced in the use of general anaesthetics. Pain must be abolished and, if necessary, kept in abeyance for long periods of time, but there must be no interference with the force or frequency of the normal uterine contractions, or with the safety of the mother and the foetus. Chloroform and ether were equally good anaesthetics, but the latter needed more expert administration, as it was more difficult to ensure quick results and required more elaborate apparatus. Stovaine was useful in certain obstetric operations, but was not advised in "common labour." Morphine was a good analgesic for the mother, but was dangerous to the foetus. For common labour he believed that intermittent chloroform, as administered by Simpson, its originator, was the best way of ensuring relief from pain. If administered by means of a Junker bottle with a small hand-bulb it was difficult to give an overdose, and so an unskilled person