of cocaine, and yet there is no drug to equal it in potency as a local application.

2. Local Infiltration.

This is the most generally useful method for minor surgical procedures. The nerve endings are paralysed by injections in their neighbourhood. The best solutions to use are 0.2 per cent. eucaine or 1 per cent. novocain, preferably in normal saline to which a few drops of 1 in 1,000 adrenalin are added. A very convenient method is to have gelatine capsules made up containing β eucaine 0.2 grams, and sodium chloride 0.8 grams. One of these is thrown into 100 c.cm. of boiling tap water when required, and, on cooling, 10 drops of 1 in 1,000 adrenalin chloride are added. The solution is then always fresh, always active, and always sterile. This amount will be sufficient for any ordinary operation, but, if necessary, twice or thrice as much may be used with perfect safety. The addition of adrenalin to these solutions is a very important advance. By constricting the vessels it not only prevents bleeding but limits the anaesthetic to the region required, increases its effect, and prevents its rapid absorption into the circulation and the resulting toxic symptoms.

In making the injection we adopt one of two methods: We may inject into the dermis or into the deep tissues. The former is essential along the line of incision, and should result in the raising of small swellings as the injection is made. Each swelling is itself anaesthetic, and may be used as the starting point for further injections. But if the deep tissues are to be entered, these too must be infiltrated, and in an extensive operation it will be better to carry this out as the various structures are exposed. In this way any superficial tumour can be removed, and even very extensive procedures carried out, with no shock and little or no haemorrhage. An important application of this method is to fractures and dislocations. Deep injections are made around the displaced ends of bone, the tissues around both surfaces being thoroughly infiltrated. In a few minutes all pain will have ceased, the reflex spasm of muscles will have disappeared, and the bones may be reduced to their normal relations with great ease.

3. Nerve Blocking.

By this means the whole region of distribution of the blocked nerve is rendered anaesthetic. The injection may be made into the nerve trunk or around it. In the former case the solutions already mentioned for infiltration may be used with very fine needles. In the latter case the solutions should be twice as strong and only small nerves should be dealt with. For large trunks endoneural injection is essential.

As an example of perineural injection we may take resection of a rib for empyema. Several cubic centimetres of solution are injected around the heads of the rib in question and of that above and below. The skin, the rib, and all the tissues to be divided will thus be rendered anaesthetic. Similarly, perineural injections around the median and ulnar nerves at the wrist will enable many operations on the hand to be performed. Endoneural injections of the brachial plexus have been extensively used by Krause for operations on the arms. An essential point of this method is that paraesthesia which should be felt in the nerve distribution after the needle is inserted and before any injection is made.

This method can be used wherever the nerves of the part are accessible—in the arms, the feet, the legs, the jaw, for example. It has the great advantage that it does not in any way interfere with the actual site of operation, and its only limits appear to be the anatomical knowledge and manipulative skill of the surgeon.

4. Venous Anaesthesia.

This most recent method of local anaesthesia we owe to Bier. It depends upon the extensive anastomosis between the superficial and deep veins. Some portion of a limb is emptied of blood by elevation, or an elastic bandage, and is cut off from the circulation by tourniquets above and below. Into one of the surface veins the anaesthetizing solution is injected under some pressure. The result is complete anaesthesia of the section of limb between the tourniquets by "infiltration" and complete

anaesthesia of the limb below by "blocking." Either of the infiltrating solutions may be used, but no adrenalin should be added (Bier). A vein may be dissected up under local anaesthesia, but it is easier to insert a short needle into the vein while it is full, and to empty the limb rapidly by elevation. The tourniquet above the field of injection should be slowly removed at the end of the operation, to avoid a sudden flooding of the circulation with alkaloid. The limb will then return to its normal state in seven or eight minutes.

This very powerful method has wide applications, and can be used for the gravest operations on the limbs, provided a tourniquet can be placed above the site of operation. Its application in lacerations of hands and feet, in amputations, and in osteomyelitis, is obvious.

By one or other of the above methods almost any operation of modern surgery can be satisfactorily carried out. For minor surgery and for operations on the limbs these methods are far superior to general narcosis, and in special circumstances they may have advantages even in graver operations. They form a very powerful weapon with whose uses every practitioner should be familiar and upon which the surgeon and anaesthetist of to-morrow may largely rely.

Those who wish for further information on the subject will do well to refer to the following papers:

- Gwynne Williams: *Choyce's System of Surgery*, vol. i, p. 680.
 Braun: *Deut. med. Woch.*, January 2nd, 1913, p. 17. *Medical Review*, May, 1913, p. 269.
 Kulenkampff: *Deut. med. Woch.*, October 3rd, 1912, p. 1878. *Medical Review*, January, 1913, p. 47.
 Lenormant: *Presse méd.*, December 21st, p. 1066. *Medical Review*, May, 1913, p. 246.

ON DILATATION OF THE FALLOPIAN TUBES FOR STERILITY.

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MANY women seek advice as to the cause of their sterility, and the usual means employed, after one is satisfied that the fault lies with the female, have, up to the present, been the correction of malpositions and flexions, the dilatation of the cervix uteri, curettement of uterus and cervix, and the cure of endocervicitis.

Though in many cases this is done, still impregnation does not take place. I am quite satisfied that there are many cases where the fault lies in the Fallopian tubes. I will briefly cite two cases which bear out my contention.

The first case in which I dilated the Fallopian tubes deliberately for sterility occurred some eight years ago. I had occasion to open Mrs. A.'s abdomen for an appendical trouble—in the quiescent period; she was a nullipara, married some five or six years, and very anxious for a child. She requested me to ascertain, if possible, while I was doing the appendicectomy what was the cause of her sterility. I opened the abdomen in the middle line, and found her uterus and ovaries were normal, but she had stenosis of both Fallopian tubes. I dilated them both from the ostium to the uterus. She made an uneventful recovery from the laparotomy, and within eighteen months gave birth to a healthy child. When last I heard of her she had had a second child.

This case gave me considerable food for thought, but it was not till April 19th, 1911, that I came across a case that gave me sufficient grounds for advising a deliberate laparotomy and dilatation of tubes as a cure of sterility. Mrs. N., aged 30, married four years, had never been pregnant. The catamenia began at 15, were regular and normal, though a little delayed at first; since marriage they had been regular; there was no pain at the period, but much pain ten days after the flow, "sickening, deadly pain across the lower abdomen"; it lasted three days and went away as suddenly as it appeared. It seemed a distinct case of "middle pain." I found that in her anxiety to get pregnant she had had the cervix dilated and curetted, and also the cervix slit up about a year after she was married. This did not have the desired effect. On examination, the vagina was found to be capacious; the cervix was slit bilaterally; the uterus seemed small, its position was normal, and the sound passed normally. I

explained the whole position to her and her husband and told them my opinion was that she had stenosis of the Fallopian tubes. They consented to a laparotomy, which was done on May 5th, 1911. On opening the abdomen, I found both tubes contained some three or four strictured portions in each. These I dilated with canaliculi and other probes, gradually increasing the size. I got well up to the uterine end of the tube in both.

The process of dilating these Fallopian tubes was somewhat difficult—that is, the probes did not pass the strictured portion easily, but with patience I felt at last that I had got through them all. I mention this to guide any one attempting a similar operation to have patience in worming the probe through. Each strictured portion showed up white when pressure was put upon it by drawing the tube over the end of the probe.

A good and rapid recovery was made from the laparotomy. The first good effect noticed was the cessation of the middle pain. Her last period was April 26th, 1912, and in February, 1913, she was delivered of a healthy male child in due course.

Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

PAPYRACEOUS FETUS PRESENTING AT A NEARLY FULL TIME LABOUR.

THE case is that of a woman aged 23, a multipara, having a good previous general health, with no evidence of syphilis in her parentage or in that of her husband. Her previous reproductive history was carefully inquired into, and showed no point of special interest. Menstruation was of the twenty-eight day type, and began when the patient was 11 years old. There were no intermenstrual symptoms. She married at 18, and within the two following years two healthy children were born, the confinements being normal in both cases.

In the present pregnancy the patient "felt life" when she appeared to be four and a half months pregnant, and about two weeks later she sustained a slight accident, falling a distance of about 2½ ft. The day before the accident she asserts that she distinctly "felt life," but afterwards these indications ceased; she thought the baby was dead.

A month later, that is, when she was about six months pregnant, she was seized with a severe attack of abdominal pain. It continued for about a week, and gradually subsided. It was limited to the lower part of the abdomen, and was not accompanied by vomiting or constipation. No doctor was called to attend at that time. She felt more breathless than usual towards the later stages of this pregnancy.

Two months later labour commenced and medical aid was summoned. She says she felt life one week before labour began. The abdomen had the appearance of an eight and a half months pregnancy. The fetal heart was faint and rapid. The head was not fixed in the pelvis. The os was about the size of half a crown and the membranes appeared to be intact. The patient, however, asserted most positively that the membranes had ruptured and a yellowish fluid had escaped. For some hours uterine contractions were feeble, but after rest, under the influence of opium, strong labour pains came on. Vaginal examination now revealed, in addition to the vertex presentation, what appeared to be a shrunken limb. Upon further investigation this was found to be a papyraceous fetus. This was removed and labour proceeded along the usual lines. After delivery of the child the uterus contracted strongly and in fifteen minutes a large placenta was expelled. Three hours later *post-partum* haemorrhage occurred. This was arrested by an intrauterine douche and ergot. She had no further trouble during the puerperium.

Examination of the placenta showed that about two-fifths was fibrotic and pale. To this portion a long thin umbilical cord was attached. The chorion and amnion were complete for each fetus, those for the papyraceous fetus being slightly shrivelled. Examination of the papyraceous fetus showed a typical appearance of a fetus which probably died about the sixth month of pregnancy.

It seems rare to have a papyraceous fetus presenting in front of its twin during a full-time or nearly full-time labour. The sudden onset of abdominal pain may have been due to the death of the fetus.

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EARLY DIAGNOSIS OF APPENDICITIS.

I was very much interested in the communication entitled "A Useful Sign in Acute Appendicitis," by Dr. John Blair, published in the issue of the BRITISH MEDICAL JOURNAL for June 14th. The study of abdominal physical signs and their interpretation has been to me a subject of great interest for many years, their very vagueness and obscurity having afforded me many hours of fascinating inquiry in order to solve them.

In the *Practitioner*, October, 1912, page 556, I published a paper entitled "Appendicitis, from a general practitioner's point of view." In this I laid great stress on the importance of two physical signs, which experience has taught me to be invaluable—namely, (a) a fullness or congestion of the right superficial circumflex iliac and the superficial epigastric veins and their radicles; (b) a slight rigidity of the muscles covering the lower right quadrant of the abdomen and a difference of tension in the right rectus abdominalis muscle.

I first had my attention drawn to these physical signs when anxiously watching appendicitis develop in a son of my own, then aged 10 years and 11 months, whose initial symptoms were most perplexing. For some time previous to his attack there had been slight abdominal pain, referred generally to the lower quadrant of the abdomen—namely, hypogastric, umbilical, and right iliac regions. From time to time he had passed a considerable quantity of mucus in his stools prior to this attack. He complained also of a transitory frontal headache. The pulse during these attacks varied from 76 to 80, and the temperature was raised by ½ to 1°. These were the main features of the initial symptoms. Two days before the attack became definitely localized to the right iliac region congestion of the right superficial circumflex iliac and the right superficial epigastric veins became marked, followed by slight rigidity of the muscles covering the lower right quadrant of the abdomen, together with a difference of tension in the right and left recti abdominalis.

Operation revealed an acutely inflamed appendix, whose apex was so virulently attacked as to show early signs of becoming gangrenous.

Since that time (October 2nd, 1910) I have never waited for the more classical symptoms to develop, but have had my cases operated upon immediately the above symptoms and physical signs have presented themselves, and have had the satisfaction of verifying their accuracy in every case, either by my surgical friends or myself when present at the operation.

There is another sign I have noticed in very virulent forms of appendicitis where an acute abscess is forming, and that is dilatation of the lymphatics of that area and oedema of the skin.

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ACCORDING to the *Journal of the American Medical Association*, delegates from the American Dermatological Association, the American Laryngological Association, the American Otological Association, the American Gynaecological Society, and other bodies, recently held a meeting in New York for the purpose of starting a campaign of publicity against cancer. Dr. George C. Clark, of New York, was elected president. Other societies interested in cancer problems are to be asked to join. The scheme is to enlighten American women on cancer by articles in women's magazines and nursing journals, by pamphlets distributed by nurses, social workers, doctors' and women's clubs, by instruction in nurses' training schools, and by lectures before women's clubs. The new organization, says our contemporary, seems to cover the same ground as other bodies already in existence and in the formation of which some of the same delegates and associations are co-operated. A movement is already on foot to correlate or amalgamate all these bodies into one effective national cancer league.