atony of the uterus is its most frequent cause. Under such circumstances it may appear as early as the sixth week of pregnancy, about the time when the serotinal vessels begin to undergo rapid enlargement in response to the stimulation of the placental chorion. Calcium and potassium are two very important constituents of the muscular substance of the uterus, and on account of some deficiency of these or the presence of some toxic material the tone and responsive power of the organ may be so impaired that blood may be extravasated and may escape externally. When haemorrhage thus results we should endeavour if possible to reinstate the uterus by removing deleterious materials and supplying those which may be deficient, and with this object we may administer potassium iodide, calcium chloride, potassium chlorate or bicarbonate, and the like. When the muscular energy of the uterus is impaired there is often enfeeblement of the nerve energy also, and with the above we may give strychnine, arsenic, digitalis, and phosphorus in some form.

Pain is the other all-important prodromal symptom of abortion. It may be noted when the uterus, in consequence of intrinsic or extrinsic changes, does not adequately respond to and fails to expand correlatively with the developing ovum. During utero-gestation the evolutionary phenomena connected therewith involve not only the uterus and vagina but also the broad ligaments, the pelvic fasciae, and the pelvis generally, and anything which interferes unduly with the harmony of the reactionary changes in these structures may provoke abortion. Apart from the presence of fibroid neoplasms, it is sometimes the substance of the uterus itself which is at fault. The whole organ, or a part of it only, in consequence of some defective co-ordination may fail to keep pace with the requirements of the growing ovum. When inco-ordination is very marked the shape of the uterus may be anomalous, and under such circumstances it may be difficult to determine whether the product of conception is lodged in the Fallopian tube or uterus. Again, the uterine tissues themselves may be responsive enough, but they may be restrained by the remnants of an old pelvic peritonitis, by some sclerotic change in the recto-vesical fascia, or more rarely by an unduly resistant and too extensive utero-vesical pad. If the adhesions due to an attack of pelvic peritonitis are of fairly recent production, or even if old, if they contain but little connective tissue then the evolutionary changes connected with gestation may invade and so soften these pathological products that a uterus which in the unimpregnated state was somewhat anchored in the pelvis may expand *pari passu* with its contained product of conception, and this may be carried to maturity. In the same way sclerosed tissues in the pelvis may also soften, as fibroids in the substance of the uterus often do. When, however, the expansion of the pregnant uterus is unduly interfered with from any of the aforesaid causes, then the irritability of the organ is more or less markedly increased, and we must in the first instance endeavour to lessen this irritability by the administration of such remedies as hydrobromic acid, the bromides, phenazonum, conium, and, if need be, opium or morphine; but during the first eight or ten weeks of pregnancy opiates should if possible be avoided, as they lessen the sensitivity of the placental villi.

Abortion, again, not infrequently results from physical or mental shock, or a combination of both influences. During utero-gestation the uterus is in a state of unstable equilibrium, the changes proceeding in it may readily be inhibited and arrested, and the muscular activity of the organ may not only be unduly aroused, but may be reduced. Moreover the serotinal vessels are so dilated and thinned that a breach in their continuity may readily be provoked. The impressionability or sensitivity of the uterus is a very variable quantity—not only in different individuals, but even in the same individual at different times. Sometimes, when it is desired to produce abortion, the greatest difficulty may be experienced in bringing about this result, whilst at other times it may be difficult to prevent abortion recurring habitually. When the pregnant uterus is adversely affected by shock, physical or mental, the evidences of any untoward disturbance may be revealed at once, but in the majority of cases there is a latent period, a period varying from one or two hours to four or five days, during which the patient is unaware that any

prejudicial influence is at work. After the tenth or twelfth week of pregnancy, the uterus may be injured directly by a blow on the lower abdomen, and abortion may more or less quickly ensue, but mechanical injury more usually acts indirectly, the concussion disturbing, it may be, the molecular state of the organ, or causing the immediate rupture of one or more of the functionally active maternal vessels. The blood thus extravasated may never make its escape externally; it may remain pent up between the fetal and maternal structures, and constitute a concealed haemorrhage. Of such an accident pain is, as a rule, the only symptom, as the haemorrhage is seldom great enough to cause any alarming disturbance. The pain is due to irregular tension of the uterus, a tension which is in a sense salutary so long as it does not excite undue contraction of the organ, and cause thereby a more extensive separation of the fetal and maternal structures, since it tends to lessen the possibility of a further haemorrhage. When confronted with a case of this kind, we must avoid the administration of any drug likely to cause either undue contraction or relaxation of the organ. Absolute rest is the best treatment. In the majority of cases, whatever the cause may be, when a breach in the continuity of one or more of the serotinal vessels takes place, some of the extravasated blood finds its way to the external genitals, and in such cases treatment should be neither routine nor haphazard, but scientific if possible. The disturbance from mental shock exerts its influence through the vasomotor nerves, and inhibits either the tone of the uterus or the processes going on in the organ, and of such external haemorrhage is invariably the sequence.

Necrosis of the amnio-chorion is a very rare cause of abortion, and it determines this event by allowing the amniotic fluid to escape.

From our point of view (that is, the clinical) degenerations of the placenta are of no interest.

A CASE OF TUBAL ABORTION.

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DURING the past seven months I have met with 3 cases of early ectopic gestation in my own private practice. Each of these has been successfully operated upon, but only the last presents special features making it worthy of record. As Bland-Sutton remarks in the latest edition of his textbook:

Tubal abortion has become a subject of importance. When attention was first drawn to the accident, many observers regarded its occurrence as questionable or of great rarity; now the condition is well recognized, and in the practice of some observers it is reported to be the most frequent mode by which tubal pregnancy terminates (Cullingworth and Taylor). In our (Bland-Sutton and Gilles) very long series of cases the proportion of tubal abortion to rupture of the tube is as 1 to 4.

HISTORY OF PRESENT CASE.

On May 14th, 1907, Mrs. R., a primipara, aged 32 years, walked up from her house to my consulting rooms, a distance of three-quarters of a mile, about 8 p.m., to get advice concerning certain irregular pains and haemorrhages from which she was suffering. She did not consider her troubles serious, and it was only in deference to the wishes of her friends that she consented to seek advice at all.

She stated that she had been regular about every twenty-six days for the past three years. She had had a child fourteen years ago. She was unwell on March 9th last as usual, but to her surprise again became poorly for four days on March 29th. On the third day after she was better—that is, on April 5th—coitus took place. This, I should say, is the important date on which impregnation was effected.

She showed just a slight sign of being poorly on April 24th, but this was so little as to be scarcely noticeable. On April 28th, the day before the expected period, coitus again took place, but she was not unwell on April 29th. On the morning of May 2nd, however, after coitus, she was seized with severe bleeding (bright red) which lasted over half an hour, and quite soaked her nightgown. Later on in the day she got up "feeling all right, and went about her washing and ironing as usual." From May 2nd she began to get "squeamish" at various periods of the day, but had no actual vomiting. On May 11th, while going to the local grocer's, she started to come unwell, and felt as if a flooding were imminent, this being accompanied by great weakness, which, however, passed off on her resting at home.

At 6.30 a.m. on May 13th, after a cup of tea, she had a severe attack of vomiting, and "then black, nasty-looking blood came, soaking the nightgown and sheet." She, however, got up later and washed them. Though feeling weak, she had no pain and the bleeding had stopped. On May 14th she went about "feeling weak and languid," but without pain or bleeding. In the evening she came to me as stated above.

From the history so far related no very clear guide as to the exact cause of her symptoms was evident. On examination her breasts showed no signs, and there was no apparent softening of the cervix with its old laceration, but there certainly was an enlarged tender right tube, without, however, any undue pulsation being noticeable. There was a little bleeding after the vaginal examination. Although signs and symptoms were not very positive, I concluded that this was probably a case of extrauterine pregnancy, and sent the patient home to bed, telling her she would require to be operated upon the next day, and that I would see her early in the morning, but to get her husband's consent in the meantime. It was fortunate that I did so, for serious internal bleeding, attended with severe attacks of pain, came on during the night, causing such collapse as to render the diagnosis unmistakable. Next morning she was lying curled up on her right side, complaining of much pain over the right iliac fossa, while there was peritoneal distension and a temperature of 101° F. Rapid examination revealed a tender mass round the right Fallopian tube. I gave her a small dose of morphine to quiet her restlessness and pain, and had her quickly removed to the private hospital, summoning two medical men to meet me there with a view to immediate operation.

Operation.

The patient was in a very low state, being absolutely bleached. On opening the abdomen, it was found to be full of blood, which passed out of the wound, and I removed clots in fistuls, having previously seized the right tube, which was surrounded by a large mass of clot. The tube itself was quite empty, having completely extruded its contents through the fimbriated end. It was quickly removed, the left tube and ovary freed from adhesions, and the abdomen rapidly sewn up, as the patient's condition was desperate.

After-History.

She was speedily got to bed, the foot of which was kept well elevated all night. By the morning she had rallied considerably. Her temperature before operation was 100.2°, and it reached that level on two successive evenings only, thereafter soon becoming normal. She had a remarkably easy and uneventful recovery, without vomiting or pain, and left the hospital in four weeks "feeling splendid," though still somewhat anæmic.

Bearing in mind that the patient was probably not more than a month pregnant (the dates of coitus being known) it is remarkable what an enormous quantity of blood was poured out from the open end of the affected tube, the width of which was no greater than that of an ordinary fountain pen. It was difficult to account for this till I thought of the explanation offered by Mr. Bland-Sutton:

It is important to remember that a gravid mole-containing tube will, after discharging the mole through its coelomic ostium, return to its normal size exactly like the uterus after labour. In regard to this, the student should remember that if any one unacquainted with the remarkable properties of unstriated muscle were shown a fetus at term in the amnion, and the uterus in which it developed an hour later, he would have his credulity sorely tried to be persuaded that the amnion and contents had been housed in the centre of the uterus. We make this observation because some thoughtful men, thoroughly familiar with the behaviour of the uterus, fail to comprehend that a similar state of things happens with the Fallopian tubes.

Recent opinions are somewhat at variance in regard to the periods at which tubal abortion is possible. According to Bland-Sutton, it can only occur during the first two months after fertilization; when the ostium is occluded (commonly by the sixth week, but it may be delayed to the eighth) the blood cannot escape without rupture of the sac, but Clarence Webster maintains that it may take place later if the fimbrial end be closed only with recently formed weak adhesions.

In 32 cases reported by Mackenrodt abortion occurred during the first month in 8 cases, during the second month in 19 cases, during the third month in 4 cases, and during the fourth month in 1 case. In 29 cases reported by Orthmann it occurred in the first month in 13 cases, the second month in 10 cases, the third month in 4 cases, and the fourth month in 2 cases. In most cases, according to Orthmann, the ovum is completely expelled. Here he again differs from Bland-Sutton, who states that incomplete tubal abortion is more common than the complete form.

Except to free the opposite Fallopian tube from adhe-

sions, I deliberately left it, in contradistinction to the practice of several surgeons in this city, who always remove both tubes when either is affected by tubal pregnancy. On this point I may fittingly quote the emphatic declaration of Bland-Sutton, who places the final words in italics, that "a series of investigations on an abundant supply of material, teaches us that a healthy Fallopian tube is more likely to become gravid than one which has been inflamed."

The possible causation of tubal pregnancy is always interesting. Bland-Sutton states that "concerning its cause or causes nothing is known," but Clarence Webster maintains that while "mechanic factors might be associated with ectopic pregnancy, there was no proof that they were the ultimate factors in its causation." He has "demonstrated the existence of the decidual reaction in the tubal mucosa in all cases of tubal pregnancy, and advanced the view that the fertilized ovum could develop only on tissue capable of undergoing a genetic reaction. Normally, in the human female, this reaction, occurring as the result of fertilization, takes place in the mucosa of the uterus. Its occasional occurrence in other portions derived from the Müllerian tract—that is, Fallopian tube—is to be regarded as a reversion in these tissues to an earlier mammalian type, either in structure or in reaction tendency."

HYSTERECTOMY AND APPENDICECTOMY PERFORMED ON A PATIENT AGED 74: RECOVERY.

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THE following case exhibits several points of interest, the most remarkable being the soft vascular condition of a fibromyoma of the uterus more than twenty years after the menopause.

History.

The patient was a healthy-looking, well-nourished woman, aged 74, who had complained of indigestion for five or six years and for twelve months had suffered from increasing abdominal distension and constipation. Examination revealed a well-marked flatulent enlargement of the abdomen and a tumour continuous with the uterus and apparently within the right broad ligament. It was rounded in shape, not tender, large enough nearly to fill the pelvis, and firmly fixed, but I thought that the fixity was in part due to its size and position. It seemed to be a soft solid or a thick-walled cystic growth. There was no history of any serious illness and the other organs were healthy, with the exception that there was a trace of albumen in the urine, the specific gravity of which was 1014 to 1016 and its quantity was normal. Menstruation was regular and free, but not excessive at any time, and its cessation, at the age of 53, was not accompanied by noticeable symptoms.

In a younger woman a fibromyoma uteri, firmly held down by the broad ligament, would have been recognized without hesitation, and the continuation of the periods until the age of 53 years was in favour of the view that a fibroid tumour existed at that time. But it was difficult to understand how a tumour of this nature could give rise to trouble which did not become urgent until the patient's age was 74, unless it was undergoing a malignant or degenerative change. Without some such alteration of structure an enlargement of a fibromyoma long after the change of life is, I believe, unknown, and yet the symptoms seemed to be due to increasing pressure on the bowel. For these reasons I thought that the mass was probably a semi-solid ovarian cystoma or possibly a uterine tumour, the nature of which was obscure. It followed that an attempt should be made to remove it, and my chief doubt was as to whether its excision was possible.

Operation.

An exploratory operation was advised, and I opened the abdomen in the Samaritan Free Hospital on January 25th, 1907. The tumour appeared to be a fibromyoma within the broad ligament, but it was quite as soft and full of blood as such a growth usually is in a woman 30 years younger than this patient. Considering the symptoms of increasing mischief, the vascularity of the growth, and the apparent ease of the operation, I decided to perform a total hysterectomy. The tumour, which was closely attached to the right side of the uterus, was enucleated through an incision along the top of the broad ligament, and when the gap thus made was being closed, after the uterus and tumour were removed, it was seen that the small intestine was adherent to a portion of