THESIS

ON

EXTRA UTERINE GESTATION

By

James Hutcheson

M.B, C.M. M.R.C.S.

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Extra Uterine Gestation.

The following case came under my charge while House Surgeon to the Royal Maternity and Simpson Memorial Hospital last summer: —

Mrs Boon æt. 26. Admitted May 8th 1884.
Menstruation began at 15; type 28 days: duration 4-7 days: quantity small.
She last menstruated in the first week of July 1886 and first noticed the movements of the child at the end of November.
Previous Obstetric History. Eight and a half years ago she had an abortion between the third & fourth months of pregnancy. This seems to have been incomplete as she suffered from menorrhagia more or less for four or five years; she then became pregnant again but aborted at the 6th month with considerable haemorrhage. Menstruation returned for a short time & then ceased for 5 months, reappearing again without any symptoms of abortion and continuing regular up to the first week of July 1886.
Condition during Pregnancy. In September

1886 she had attacks of severe vomiting for about 3 weeks. This was accompanied with pain in the abdomen & a discharge of blood from the vagina, & something came away which was thought to be an ovum. The pain and discharge continuing she went to the Infirmary and was under Dr. Croom's care for 5 weeks. When she left the pain & discharge had ceased but two weeks later the pain returned although not so severely as at first. She was re-admitted to the Infirmary and remained 4 weeks. During this time the pain diminished but was not relieved. It was felt in the front of the abdomen & the left side below the ribs & was markedly paroxysmal in character, coming on at night about 10 p.m. and lasting till 4-5 a.m. she then had relief till the afternoon when it returned for a few hours. Any movement of the child caused pain.

In the end of January 1887 she was admitted to the Maternity Hospital under Professor Simpson, who on examination suspected the gestation was extra-uterine but she only remained ten days in the Hospital. From

then up to the beginning of April she continued in much the same state but at this time the foetal movements became very strong and then ceased and that night there was a little bloody discharge from the vagina. Since then the pain has almost disappeared, the abdomen has diminished in size and also the breasts, the appetite has improved and she sleeps much better at nights.

Physical Examination on May 9th

Patient is rather under the medium size, delicate looking, dark, face pale and expression anxious. The breasts are small and when squeezed a little milk escapes: the areolae are well marked but not large: no striae are present.

Abdomen - On inspection there are a few striae and a faint linea nigra. It measures 32 inches in circumference at the umbilicus and 30 inches at the ensiform cartilage (a week later it had diminished 1 inch at the umbilicus).

The abdominal walls are lax & there is tenderness in the hypogastric & right iliac regions.

On palpation a swelling is felt to lie obliquely, reaching from the pelvis and right-

iliac fossa up to below the level of the left ribs. Its direction is to the left and its size vertically is 8 inches. The head of the foetus can be palpated between the hands immediately below the ribs on the left side. The limbs of the foetus lie to the front & right side & feel distinct. No uterine bruit or foetal heart can be heard

Vaginal Examination. Pudenda normal. Vagina moist, not very roomy. The cervix is somewhat firmer than in ordinary pregnancy; the os admits the tip of the finger & looks downwards and backwards. The cervix is in its normal position and movable but this causes pain. Through the vaginal roof a round somewhat elastic swelling is felt which is supposed to be the expanded body of the uterus. Bimanual examination was unsatisfactory and position of the uterus could not be distinctly ascertained owing to the tenderness of the lower part of the abdomen.

Measurements of the Pelvis

Iliac crests 9 $\frac{3}{4}$ inches; Iliac Spines 9 inches

External Conjugate 7 $\frac{1}{2}$ inches

Interischiantic diameter 11 $\frac{1}{4}$ inches.

After a few days rest the sound was introduced by Dr. Keiller into the uterus & was found to pass upwards freely for 4 inches. The following day the cervix was dilated with tupelo tents and afterwards with Barnes Bags and the uterus found empty.
On May 18th at 4 a.m. she awakened with severe pain in the lower part of the abdomen on the left side. She began to vomit, became pale & somewhat collapsed. Brandy was given internally, 1/4 gr. Morphia hypodermically & hot fomentations applied to the abdomen. Temp. 101.4 Pulse 136. Throughout the day the pain became worse & extended over the whole abdomen & she lies on her back with her knees drawn up. Micturition causes great pain; urine is scanty & loaded with urates but contains no albumen (none appeared later). The morphia was continued in 1/4 gr. Suppositories every 4-6 hours & hot vaginal douches were given every 1-2 hours. These gave some relief.
A consultation was held to-day when it was decided to delay operating to see if the peritonitis diminished.
May 20th Yesterday there was no improvement She had two attacks of vomiting, vomited matter

copious, yellowish sour smelling. To-day she vomited twice, quantity large, last attack had a faecal appearance & odour. A large soap & water enema was given & bowels moved well without much pain but the motion was very light-coloured. The vomiting became more distressing & feeding by the mouth was stopped & nutritive enemata of beef tea & brandy given every 4 hours. These were well retained.
Temp. 100·4. Pulse 120. Abdomen is not so firm or tender as formerly but has become tympanitic at the right side & slightly distended Still pain on micturition.
May 21st Patient weaker. Temp. 100·6 Pulse 120 feeble & ill filled. Has had two attacks of faecal vomiting, once during the night & once this morning. Enemata & morphia continued with ice to suck. No flatus or faeces passed by rectum. Abdomen in same condition, does not complain of so much pain.
A consultation was held to-day to consider the new complication of obstruction of the bowels: it was decided to wait 24 hours to see if it continued.
May 22nd No improvement to-day. Nothing passed by bowel. Vomited faecal matter once

this morning. Temp. 99.2° Pulse 110. Complains more of pain and distension.

At 1.30 p.m. Laparotomy was performed by Professor Simpson. On cutting through the abdominal wall the cyst was exposed & an opening made in it allowing a considerable quantity of liquor amnii to escape. The foetus (dead) was found lying in the above mentioned position. It weighed 5 lbs & measured 20 inches in length seemed quite fresh; two inches from the umbilicus the cord was contracted & broken (supposed to have snapped during the operation) & the other end attached to the placenta could not be found. The posterior & lower part of the sac seemed to be covered by a large placenta, this was not touched. The sac was washed out with warm carbolic lotion, a drainage tube introduced & the edges of the sac stitched to the margins of the abdominal wound. The wound was then closed except round the drainage tube so as to allow the discharge & placenta to come away. The obstruction of the bowel (if any beyond the weight of the foetus) was not searched for owing to patients weak state & the matting of the intestines from the peritonitis.

Patient slept a little in the afternoon. In the

evening the temp. rose to 102.2° Pulse 126 intermittent. The pain in abdomen was severe but no flatus escaped. Enemata continued at longer intervals to-day.

May 23rd Patient is much weaker. Pulse rapid & scarcely perceptible. Temp 99.6°. A little flatus escaped from bowel but no faeces. She does not complain of pain & knees are not drawn up. Wound dressed, profuse serous discharge from it. Patient stimulated freely. In the evening the temp rose to 105.6° in the vagina. Pulse 144 very feeble. Breathing 56. Hands cold & covered with clammy perspiration. Enemata rejected but no faeces mixed with it. Stimulant continued by mouth & subcutaneously.

Patient became gradually weaker & died at 2 a.m. on May 24th.

Extra-Uterine Gestation

Definition. Extra-uterine gestation consists in an arrest & development of the ovum outside the cavity of the uterus, it may be in some part of the Fallopian tube, in the cavity of the abdomen or the ovary itself.

Classification. Until the year 1824, three species were recognised, the ovarian, tubal & abdominal. In this year Breschet added what he supposed to be a new variety viz Interstitial Pregnancy, which he thought was caused by the ovum developing in the midst of the tissues of the uterus itself, having found its way into this abnormal position by a venous sinus. Cazeaux suggested it was due to the ovum's arrest in a diverticulum of the canal of that portion of the Fallopian tube which traverses the uterine wall. The true nature of this form of pregnancy was shown later to be simply a variety of tubal gestation. the ovum being arrested in the Interstitial portion of the tube - i.e. that portion of the tube which traverses the uterine wall, & there developing; & that if it is found in the tissues of the uterus it is the result of a rupture of an Interstitial Pregnancy. In 1837 Dezeimeris described 10 species. In 1873 (Lond. Obs. Trans.) a much simpler classification was adopted by Tait

who maintains that every case of extra-uterine gestation is tubal in its origin & divides it into three varieties: (1) Tubo-ovarian, when the ovum has been fertilized in the infundibulum before the separation has occurred between that structure & the surface of the ovary. (2) Tubal, (3) Interstitial, where the attachment has been formed to that part of the tube lying in the uterine wall. The abdominal variety of gestation he says is due to rupture of the tube & escape of the ovum & this may become intra-peritoneal or extra-peritoneal just as the tube happens to burst.

Gaillard Thomas (Dis. of Women) divides it into three varieties: (1) Tubal, which consists in the arrest of the impregnated ovum in the Fallopian tube and its development there, or it may develope just where the fimbriated end of the tube clasps the ovary. (2) Interstitial, the ovum is arrested in that part of the tube which passes through the uterine wall, it attaches itself, distends the parenchyma of the uterus to make its nidus & causes it to protrude partly towards the uterine cavity, partly towards the abdominal. (3) Abdominal Pregnancy, here one of two things occur, either the tube holding the impregnated ovum in its grasp breaks away from its ovarian attachment, falls into the abdominal cavity & remains there, while the ovum casting out

tentacula attaches itself to the peritoneum grows, or, as some suppose possible the impregnated egg falls out of the grasp of the tube & getting its nourishment from the peritoneum develops independently of the lining membrane of the uterus which extends throughout the tube.

Parry (Extra Uterine Pregnancy 1876) classified them thus:-

Tubal Pregnancy.

(1) Tubo-ovarian (the germ being arrested in the pavilion which contracts adhesions with the ovary.)

(2) Tubo-abdominal (germ arrested in the same locality. The tube may contract adhesions with neighbouring organs. If it does not, the Chorion may project into the abdominal cavity with a part of its surface bare)

(3) Tubal proper, (germ arrested between the pavilion & that portion of the oviduct which traverses the uterine wall)

(4) Tubo-uterine (germ arrested in that portion of the tube which passes through the uterus)

Ovarian Pregnancy.

(1) Ovarian proper (germ contained in the ovary, that organ remaining free from adhesions)

(2) Vario-Tubal. (germ contained in the ovary which contracts adhesions with the fimbrion of the tube.)

Ventral or Abdominal Pregnancy.
- (1) Primary. (ovum developed from the outset in the peritoneal cavity)
- (2) Secondary. (development commences in the tube or ovary, the cyst ruptures, ovum escapes & continues to live & develope in the peritoneal cavity.)

A simpler classification & one which embraces all the varieties of practical importance is the following:-

I. Tubal
- (1) Interstitial
- (2) Tubal Proper
- (3) Tubo-Ovarian

II. Abdominal
- (1) Primary
- (2) Secondary

III. Ovarian

IV. In a Bi-lobed Uterus.

Although pregnancy in the rudimentary horn of a bi-lobed uterus is not strictly speaking extra-uterine, yet as its results & treatment are the same it may be included here.

I. Tubal Pregnancy. Tubal pregnancy was first recognised by Riolanus in 1640 in the body of a washerwoman in the service of Anne of Austria & was described by him in his Anthropographia in 1649. It is now known to be the most frequent of extra-uterine gestations. Normally the ovum on its way from the ovary to the uterine cavity passes from the ruptured Graafian follicle through the fimbriated end of the Fallopian tube, canal of the Fallopian tube, interstitial portion of Fallopian tube, horn of the uterus. It may be arrested at any point in this course & becoming attached pass through the stages of foetal development just as it does in the uterine cavity — (1) in the tube at its uterine end where it passes through the substance of the wall of the uterus - Interstitial - (2) in the tube proper, this is the commonest variety. (3) at or near the fimbriated extremity of the tube which contracts adhesions with the ovary so that part of the cyst is formed by the tube & part by the ovary - Tubo-ovarian.

II. Abdominal Pregnancy. The ovum is developed in the abdominal cavity, this development may be primary or secondary. In Primary Abdominal Pregnancy the ovum is developed in the peritoneal cavity without having any connection with the mucous tract of the uterus or tubes. Tait denies the occurrence of Primary Abdominal Gestation. He says that every case

of extra-uterine gestation is tubal in its origin & that there are only two forms of misplaced conception, in the one the oviduct with its peritoneal layer bursts & the ovum escapes into the peritoneal cavity & developes intra-peritoneally; in the other the tube alone ruptures & not the peritoneum - the rupture occurring on its under surface - & the ovum falls down between the layers of the broad ligament & there developes extra-peritoneally (if the patient survives). Thomas believes that in the beginning of its development the impregnated ovum never attaches itself to, or draws its nourishment from, any other parts than those lined by the mucous membrane of the uterus or tubes. He continues to say "Knowing as we do the delicate & subtle connections which the chorion establishes with the maternal tissues, it is certainly difficult to believe that an impregnated ovum, falling free into the peritoneal cavity, or detained within the Graafian vesicle, can with parts so unlike the lining of the uterus establish relations almost identical with those which are normal" Barnes (Dis. of Women and Obstetric Medicine & Surgery) thinks it doubtful if abdominal gestation is ever primary & believes it is always secondary upon tubal or ovarian, the sac in which they were contained having given way & the ovum having retained its vitality through partial attachments to the original sac.

There is no evidence however to show that in most cases there is an early laceration of a tubal or ovarian sac, which according to these authorities occurs in all cases of abdominal pregnancy. Playfair (Science & Practice of Midwifery) says it is not unreasonable to admit the usual explanation of these cases that the ovule already impregnated escaped the grasp of the Fallopian tube & fell into the abdominal cavity where it rooted itself & developed. He also considers it by no means rare for impregnated ovules to drop into the peritoneal cavity & that the majority of those that do perish without doing any harm.

Spermatozoids have been seen on the surface of the ovaries 4-8 days after connection, it is therefore probable that they may live for sometime on the surface of the peritoneum & that the secretion of this membrane is not destructive to their life. The possibility therefore cannot be doubted that an ovum may be fecundated by them outside the uterus & Fallopian tubes. That not only this can occur but the ovum thus fertilised may attach itself to the peritoneum & there develope is fully proved by Koberlé's case (Keller, Des Grossesses Extra-uterines) where the body of the uterus & part of the cervix was removed leaving the ovaries. In the part of the cervix that remained there was a fistulous opening from the

Vagina into the abdomen & through this the Spermatozoa passed, came in contact with the ovum and caused primary abdominal gestation. This case proves that primary abdominal gestation can occur; after impregnation the ovum became attached to the peritoneum & went through the process of development without having any connection with the mucous membrane of the tubes or uterus. Further proof is obtained in the case of Lecluyse published in Belgium in 1869 His patient had a fistulous opening on the anterior surface of the uterus, the result of a previous Caesarean Section, & through which an ovum escaped into the peritoneal cavity & continued to develope for 7-8 months, the placenta being attached to the anterior surface of the small intestine. In this case the ovum was fertilised in the usual manner & passed into the uterus but before becoming attached to the uterine mucous membrane it passed through the fistulous opening into the peritoneal cavity.

From these cases we may conclude that if an ovum is fertilised & fails to enter the Fallopian tube, it may fall into the peritoneal cavity & there attach itself to the peritoneum & continue its development until it is completed. Schroeder (Manual of Medicine) says, When we look at the mechanism adopted by nature

for seizing the ovum & conveying it to the womb there to be developed if fecundated, or allowed to pass off with the secretions if otherwise, it seems surprising that extra-uterine pregnancies do not occur more often than is actually the case. The impediments to the entrance of the ovum into the Fallopian tube are various. Thus the Graafian follicle may have ruptured at a spot too far distant from the end of the tube; or an abormal movement of the abdominal contents especially of the intestines may have forcibly deviated the ovum from its right course; or the movement of the cilia on the epithelium of the tube may have ceased from partial or entire destruction of the epithelium in consequence of a catarrh of the tube; or the end of the tube of the same side is occluded & the spermatozoa have passed through the tube of the other side into the pelvic cavity. Parry quotes two cases that assist in proving the occurrence of primary abdominal pregnancy; the first was that of Leigh where the patient died after having carried the child four years & on P.M. the Cyst was found attached to the omentum while the internal genital organs were not involved; the second was that of Rupin's where there was a twin abdominal pregnancy, the placenta was situated at the fundus, the tumour being in the retro-uterine pouch & so low down that an attempt

was made to deliver the woman by incising the posterior wall of the vagina in the 6th month of pregnancy. After death nothing unusual was found about the Fallopian tubes or broad ligaments; the right ovary was normal & contained a corpus luteum while the left was somewhat atrophied.

The attachment of the placenta has been supposed to form a certain guide to the variety of the pregnancy. Thus it has been found inserted on the omentum & stomach, between the mesentery & colon, to the upper & anterior surface of the bladder, but attachment of the placenta to a portion of the peritoneum however remote from the uterus, tubes & ovaries does not prove the existence of primary abdominal pregnancy.

In Secondary Abdominal Pregnancy. the ovum is originally formed in the tube or ovary where it develops for a variable time, usually 1-3 months, then rupture takes place & the contents are expelled into the peritoneal cavity forming an intra peritoneal gestation; or in a tubal case if the rupture occurs on the under surface of the tube the ovum may pass down between the layers of the broad ligament & develope extra-peritoneally.

Hart (Edin. Med. Jour. 1884) describes a case of extra-peritoneal gestation - the foetus & placenta lying in the extra-peritoneal tissue -.

Primary abdominal gestations are intra-peritoneal, a secondary abdominal gestation may be intra- or extra-peritoneal.

III. Ovarian Pregnancy. That development of the ovum in the ovary could take place was admitted until 1825 when Velpeau after examining four specimens of supposed ovarian pregnancy asserted that in three of the cases the ovum was not situated within but on the surface of the ovary. Numerous writers in France, England & Germany supported him but authentic cases have since been recorded.

In Ovarian pregnancy development must take place in the substance of the ovary. It may be that spermatozoa pass through the walls of the Graafian follicle before it ruptures & meeting the ovum within the cavity of the follicle there fertilize it. Spermatozoa have been demonstrated on the surface of the ovary but not their passage through the unruptured wall of a Graafian follicle. The most reasonable explanation is, that the Graafian follicle may rupture & the ovum remain instead of being discharged. Through this rupture in the wall of the follicle the spermatozoa may reach & impregnate the ovule which may develope in the situation in which it has been detained. Peuch (Annal. de Gynec. 1878) admits two varieties of

ovarian pregnancy according as the foetus has developed in a vesicle which has remained open or in one which has closed immediately after fecundation. Parry says the weight of authority is in favour of ovarian pregnancy. Tait is inclined to regard the evidence advanced so far concerning the alleged occurrence of gestation within the proper tissue of the ovary as by no means complete & cannot admit its having been proved, for "if we consider for a moment the chain of circumstances which alone could lead to such an incident we can readily understand in the first place how extremely rare its occurrence must be; & in the second place how difficult it is to prove what is absolutely necessary - that the ovum was developed within the follicle which it had never left." Playfair and Barnes do not deny the existence of ovarian pregnancy but consider it to be rare and exceptional.

Several authentic cases are published which seem to show that it can occur - Freund relates a case - (Edin. Obs. Trans. 1882-83) Patient aged 24, had had coition only once & this was disturbed by a sudden fright. During the later months of gestation he diagnosed an ovarian pregnancy. He felt the round ligament, the tube, & the left ovarian ligament distinct from the uterus whose fundus could be defined rising up

on the tumour; on the Right side the tube + ovary could be distinctly felt. One year after conception Laparotomy was performed + the found it an ovarian pregnancy of the left side, the cyst being completely free in the greater part of its extent, only on the left wall of the pelvis + the floor of the Pouch of Douglas was it adherent.
Hasselberg (Med. Rec 1874) records a case of fatal rupture at the 3rd month. On P.M. there was a considerable amount of recent + old clots in the pelvic cavity. Behind the uterus was a tumour about the size of a fist with two small rents on its upper surface + within, was an ovum containing a foetus. No tube could be found, but alongside the cavity was a corpus luteum.
Talbot (Med. Rec. 1879) relates a case which ruptured at the end of the 4th month causing death of the patient. On P.M. two pints of blood were found in the abdominal cavity. The enlarged ovary was seen in the folds of the broad ligament with a rent in it. The fimbriated extremity of the Fallopian tube grasped the ovary at its upper + inner border + was of usual size. A careful examination of the tissues near the rent showed it to be true ovarian tissue.
In Duverny's case the patient was pregnant for the ninth time, + at the 3rd month fell ill with

collapse from severe colic in the right groin & died in 10 hours. The abdomen was full of clots & a small foetus was found in the midst. The right ovary was torn longitudinally & in the half of the side not attached to the tube its whole capacity was filled with clots (Barnes Dis. of Women).

Spiegelberg has established the authenticity of nine cases. M. Peuch has recently described a case which seems conclusive proof. - The left Fallopian tube like the right was fixed behind the ovary by adhesions but had remained permeable. Its pavilion was closed in great measure but not completely & admitted a probe. The left ovary contained Graafian follicles of various degrees of development. On its outer extremity was a rounded body about the size of a large cherry. Its envelope was transparent & furnished with well marked reticulated vessels. At one spot a deep violet coloration was seen over a space about the size of a lentil & around this the envelope was thickened. Over most of the rest of the surface a yellowish substance could be seen through the translucent envelope. On opening the cyst a prominence with a villous surface was found attached at the area of coloration while over the rest of the surface a layer ½ m.m. thick could be easily separated

from the cyst-wall. The villus prominence was furnished with large vessels & formed a semi-ellipsoid measuring 11 m.m. by 10 m.m. On incising this it was found to contain a cavity distended by clear fluid & in this fluid floated an embryo in the form of a vermiform body 1 m. long curved in the middle & swollen at one extremity.

Ovarian pregnancy is a rare & exceptional variety and as far as treatment & results are concerned does not differ from tubular or abdominal gestation. It is rarely diagnosed during life from tubal gestation. Little is known of its pathology. The foetal cyst possesses no peritoneal covering as the peritoneum is not prolonged over the surface of the ovary. The sac is composed of the proper tissue of the ovary. The chorion is in immediate contact with the interior of the sac, but the method by which the ovum becomes attached to the ovarian tissue is not known. Probably the process does not differ from that which is to be described in tubal gestation. Rupture generally occurs during the first period of gestation.

IV. <u>Gestation in the Rudimentary horn of a Bi-lobed uterus.</u> When this occurs the horn becomes distended by the enlarging ovum & after a time when further distension is impossible laceration takes place

Rupture may be delayed to a later period than in tubal gestation as the supplementary horn is more distensible. In a few cases it has gone on to term without rupture. In most cases of this form of pregnancy, the cyst in the rudimentary horn is shut off from the Fallopian tube on one side & the developed half of the uterus on the other. At the same time the corpus luteum & the ovum are found on the same side. Parry concludes that the canal of the rudimentary horn becomes occluded after impregnation has taken place. Barnes agrees with this. Turner (Ed. Med. Jour 1864) describes two cases. In the first case the patient died of rupture of the sac when 3 months developed. The wall of the left cornu (the undeveloped pregnant one) was muscular like that of a pregnant uterus & at the place of rupture the placenta could be seen partially adherent to its inner surface. There was no canal in the pedicle connecting the cavity of the unimpregnated horn with that of the right horn or the cervix or vagina.
In the second case it was also the left horn that was rudimentary & pregnant. The foetus was retained until after the full period of utero-gestation. Labour pains came on & on examination the os uteri was low down in the vagina & the uterus was found of a natural size & unimpregnated. There was an

enlargement of the abdomen extending a little to the left-side & nearly of the size & shape of a uterus containing a foetus at term. The foetal heart was heard. The pains were severe & complicated with convulsions. They continued several days & then she began to go about again as usual; six months later she died of phthisis. On P.M. a sac was found containing a male foetus. One side of the sac was affixed by a pedicle to the cervix uteri; there was no decidual membrane in the right cornu. A fine probe could be passed along the left Fallopian tube up to the wall of the sac but its inner orifice was obstructed. No corpus luteum was seen in either ovary. No communication could be made out between the sac of the impregnated cornu & the canal of the cervix.

In both cases the round ligament was found external to the sac. Turner is disposed to think that the pedicle must have been solid before impregnation was affected & he argues in favour of the travelling of the semen along the cornu & tube of the more perfectly developed side into the tube of the rudimentary cornu & then into the cavity of the latter.

Thirteen cases have been collected by Kussmaul all of which ended in rupture between the fourth & sixth month. He also relates a case described by Fritze in 1779 in which the cyst did not rupture; the embryo died at the end of

the fifth month & was carried for 31 years when suppuration occurred. A case is reported by Campbell Pope (Lond. Obs. Trans 1886) - the cyst was connected to the left upper angle of the uterus by a pedicle 1¼ inches long, fleshy and consisting of a mass of sinuses which conveyed the principal blood supply to the cyst. There was no channel of communication between the uterus & the cyst. The left appendages, apparently normal, sprang from the anterior surface of the cyst; the Fallopian tube on this side measured 6 inches, & was 1 inch longer than the right tube. No recent corpus luteum was found in either ovary.
A. Macdonald (Ed. Obs. Trans 1884) successfully operated on a case. The left horn was the pregnant one & was removed. The patient recovered & was afterwards able to demonstrate the right horn. Two years before the operation she had given birth to a living child which must have been from the right horn.
This form of gestation has often been mistaken for tubal pregnancy as its progress, symptoms & terminations are nearly identical. On P.M. examination also they are difficult to distinguish from one another. The position of the round ligament is valuable in diagnosis; in tubal cases it is attached to the uterine or inner side of the cyst; in pregnancy in a rudimentary horn it is situated external to the sac. This however does not-

exclude Interstitial Pregnancy, as the round ligament here is also situated on the outer side of the cyst. The distinguishing point between these two is, that in Interstitial Pregnancy there is a membranous wall between the gravid sac & the uterine cavity; while if the ovum is contained in a rudimentary horn the sac is joined to the developed half of the uterus by a muscular band.

If the pregnancy is tubal, the Fallopian tubes on the two sides will be found entering the womb at opposite points & of the normal position on the right & left halves of the organ. The uterus itself will be found symmetrical & normal in its development. In Tubal Pregnancy the length of the Fallopian tube on the impregnated side external to the dilatation, is necessarily less than that of the entire extent of the unimpregnated tube, & the diminution in length is more strongly marked the nearer the sac lies to the fimbriated extremity. In cornual pregnancy on the other hand no diminution in the length of the tube on the impregnated side occurs.

Again in pregnancy in a rudimentary horn the sac will probably contain a true decidua, which is not the case in tubal pregnancy.

Pathology.

In considering the pathology we may look on extra-uterine pregnancies as forming two great classes, the tubal & the abdominal.

Tubal Pregnancy. On section the normal Fallopian tube is made up of 3 layers - from without inwards they are (1) peritoneum & below this is some connective tissue & elastic fibres separating it from (2) non-striped muscular fibres arranged circularly & longitudinally (the former being inner) (3) mucous membrane lined with ciliated columnar epithelium. The mucous membrane is thrown into longitudinal folds & contains no glands.

When the ovum is arrested in the tube proper it has for its coverings the different layers of the tube. The mucous membrane hypertrophies & becomes more vascular, but, unlike the changes that occur in the mucous membrane of the gravid uterus no decidua is formed, there is no decidua serotina to form a maternal portion to the placenta & no decidua reflexa to rise up around the ovum & enclose it. The formation of the chorion around the ovum & the sprouting of the villi are the same as in normal pregnancy, but, instead of sinking into the mucous membrane the villi spread out over the mucous membrane & become adherent to it aided by the presence of some plastic material. Hicks (Guys Hosp-

ital Reports 1860) examined the cyst in a patient who died of rupture at the 6th week & found "the inner surface of the sac was covered with the ciliated columnar epithelium proper to the mucous membrane of the Fallopian tube (which originally lined it) & upon this surface the terminal tufts of the villi spread out, the epithelium remaining on the parts not occupied by them. These terminations of the villi did not enter the substance of the tube wall, which was apparently too solid & dense, but seemed merely adherent to it, a very minute portion of plastic matter seeming to assist at the point of contact. The coats of the villi were single as far as could be detected so that the placenta was purely ovular. There was no maternal structure entering into the composition of the placenta. The maternal vessels ramified beneath the epithelium covered surface where they could be seen in some places only slightly raised above the level. These capillaries were evidently enlarged & numerous but not so much as the uterine decidual membrane".

Paraj's opinion is the same as Sticks? Barnes also agrees with this, he says "the ovum develops its chorion into placenta which adheres to rather than penetrates the tubal mucous membrane". Playfair is of opinion that the hypertrophied mucous membrane forms a pseudo-decidua but forms no sheath around the ovum analagous to the

decidua reflena, & that the villi engraft themselves into the mucous membrane & fix the ovum in its new position. Schroeder differs from all in saying that the mucous membrane of the tube proliferates in a way similar to that of the uterus in utero-gestation & consequently a normal decidua serotina, often a very thick decidua vera & even a decidua reflena is formed, also the villi of the Chorion sink into the serotina & form the placenta, the rest of the periphery atrophing.

From these opinions it appears that the maternal portion of the placenta is absent. The villi of the Chorion are applied to & do not penetrate the mucous membrane of the tube. The maternal vessels below the epithelial layer of the tube are enlarged & fixation of the ovum takes place by an interchange of gases & fluids between the maternal & fœtal blood.

Owing to this arrangement of the villi the ovum is loosely attached to the tube & thus haemorrhage can very easily take place from laceration of them.

The non-striped muscular fibres of the tube hypertrophy & as the ovum enlarges & distends the tube, they become stretched & seperated so that the ovum bulges out at parts being only covered by thinned out mucous membrane & peritoneum. The peritoneum rarely undergoes much change in this stage of the pregnancy. The other parts of the tube may remain unaltered & the canal open

but usually it is so stretched & changed that the canal cannot be detected. Most frequently it is that part of the tube nearest the uterus which cannot be made out. Parry says it is generally found occluded, from the pouring out of plastic matter into the tissues, on both the proximal & distal side of the cyst after death from rupture; & this is an effect & not a cause of extra-uterine gestation.

Tubal pregnancy at this time forms a smooth oval tumour which as a rule has not formed any adhesion to the surrounding structures. The presence of the ovum here leads to great vascularity of the broad ligaments & Fallopian tubes. This is important in the profuse haemorrhage that follows rupture.

In Interstitial Pregnancy the wall of the sac is formed of the same structures as in the tubal form but in addition we get the thicker layer of muscular tissue belonging to the uterus. The sac thus formed protrudes partly towards the uterine cavity partly towards the abdominal. The uterine orifice of the tube may or may not become occluded. Dr Poppel (Brit. & For. Medico Chir. Rev. (1858)) described a case of this form of pregnancy. On opening the uterus longitudinally along its anterior aspect two cavities were exposed. The lower one was clothed with a thick decidua & was the proper uterine cavity. The upper

cavity was divided from the lower by a septum of muscular structure all but a small opening of communication. It contained a fresh foetus of about the 5th month. Recently (Lond. Obs. Trans. 1882) a case has been related by Doran - The patient died at the end of the second month from rupture. The uterus was 5 inches long & the cavity lined with a well marked decidua. The right side of the fundus was dilated & in it was a rent 2½ inches long which exposed a cavity 1½ inches vertically & 1½ inches antero-posteriorly. The walls were very thin along the line of laceration. The right round ligament was attached to the outer wall of the cyst. The inner wall of the cyst was rough & from it hung broken tags of chorion but there was no trace of a true decidua. The right Fallopian tube passed into the outer and anterior aspect of the walls of the cyst, expanding slightly into a funnel shaped orifice which opened into the cavity of the cyst close to the tear in its walls; it was lined with smooth epithelium & admitted a bristle being passed along it into the cyst. There was also a funnel shaped aperture from the cyst into the uterus with a smooth lining & through which a bristle could be passed. The right ovary contained a corpus luteum. In this case the tube was open on both sides of the cyst.

In Tubo-Ovarian pregnancy the cyst wall is formed

partly of the fimbriated extremity of the tube & partly by the ovary & the adhesion which bind these two together. If it should happen that the pavilion of the tube alone is involved, only one portion of the ovum may be covered, while the remainder may project into the peritoneal cavity, the chorion being entirely unprotected by any other tissues. According to Barnes the tubo-ovarian sac is more rounded than the tubal.

Progress and Termination of Tubal Pregnancy.

The most favourable termination of tubal pregnancy is when the embryo perishes early & then recovery takes place without rupture, the embryo is re-absorbed. If the more fully developed embryo dies it may be converted into a lithopaedion within the tube without rupture of it.

Tubal pregnancy terminating in this manner is of rare occurrence. The usual course of events is for the cyst to continue growing from one to three months & in the great majority of cases terminates by rupture causing the death of the patient. Death being due to shock and haemorrhage or subsequently intense peritonitis. The rupture is generally caused by distension of the tube which at last yields at the point which is most stretched. It may be hastened by accidental circumstances as a fall or a blow or excitement of sensual intercourse. Burton relates

a case (Lond. Obs. Trans. 1881) where rupture was caused by a fall during coitus & resulted in death in 9 hours. A patient of Isaacs (Lond. Obs. Trans 1876) felt a sudden wrench in the right side when lifting a heavy washing machine, this was followed by symptoms of rupture.

Barnes says rupture usually occurs at the menstrual epoch, & that the tube does not burst at once, for if it did there would be no premonitory haemorrhage. He draws an analogy between this haemorrhage & that of placenta praevia. In both cases the gestation occurs in an abnormal locality. The Fallopian tube like the lower segment of the uterus has only a limited capacity of growth. This is soon overtaken by the growing ovum which not finding the room it requires, excites spasmodic contractions of the sac. Hence partial detachment of the ovum is caused & some haemorrhage ensues. In the case of tubal pregnancy partial detachment is very easy owing to the scanty development of decidua. This haemorrhage in both cases of placenta praevia & tubal gestation may escape externally, in the first case the os uteri offers a ready exit; in the second case the exit is not so easy & the sac is comparatively feeble. Hence a large proportion of the blood poured out by the severance of relation between placenta & sac is retained in the sac. The distension becomes extreme. Renewed spasmodic action of the

muscular wall is excited & the sac bursts. The ovum itself does not always burst & probably rarely does until the sac has done so. The accumulated blood in the tube together with fresh blood proceeding from the torn vessels of the tube is now poured into the abdominal cavity causing the shock & other symptoms attending rupture.

When the rupture occurs the ovum escapes into the peritoneal cavity along with much blood, or if the tear has been on the under surface of the tube it may pass down between the layers of the broad ligament & may there continue to develope extra-peritoneally. The intra-peritoneal is the more common variety & the more fatal; while the extra-peritoneal variety is much rarer & Tait believes less fatal & more amenable to treatment. He also is of opinion (Brit. Med. Jour 1884) that the rupture nearly always occurs at the site of the placenta because the tissues are thinner, more vascular, & more easily torn than elsewhere & that the source of the haemorrhage is the enlarged maternal vessels in this position.

The amount of blood poured out after rupture varies much in different cases. In Burtons case 4 to 5 pints of "very dark blood" was removed from the pelvis. In Dorans case (Lond. Obs. Trans. 1882) there was 6 lbs. of clot and 5 pints of bloody fluid. In Rouths case (Lond. Obs. Trans. 1879) there was a clot "which could hardly be contained in a

gallipot" and a pint of fluid blood. In Godson's case (Lond. Obs. Trans 1881) there were 2 pints of blood in the peritoneum. In opening the abdominal cavity the blood is found either fluid or partly coagulated. The peritoneum is almost always found to be healthy. Sometimes rupture occurs without haemorrhage or at least without fatal haemorrhage & the patient survives the accident. The extent of the rupture in the cyst varies greatly & bears no proportion to the amount of haemorrhage. In a case reported by Cathcart of Philadelphia in 1873 he found a gallon of blood in the abdominal cavity while the rupture was only two lines in diameter with sharply defined edges. In D. Buntons case (already quoted) the opening was in the upper surface of the cyst & admitted a probe. In Routh's case (already quoted) a hole of the calibre of a No. 6 catheter was found in the back of the tumour. In Harts case (Brit. Med. Jour 1886) the rupture was about as large as the tip of the index finger. As an example of a large rupture we have a case of Tait's (Brit. Med. Jour. 1885) where it was 3 inches long.

The partial or complete escape of the ovum through the rent does not increase the loss of blood. Parry thinks that complete discharge of the ovum is more favourable than its entire or partial retention. Playfair on the other hand says that the haemorrhage may cease on

account of the ovum protruding through the aperture & acting as a plug.

Rupture usually occurs at an early period of pregnancy most generally from the 4th to the 12th week, rarely later. Hecker reports 45 cases of tubal pregnancy. In 26 cases rupture occurred in the first month, in 11 cases in the third month, in 7 cases in the fourth & once in the fifth.

Spiegelberg & Prof. Simpson report cases in which the ovum advanced to term in the tube without laceration. In Spiegelbergs case (New York Med. Journ 1871) the patient died at term. On P.M. a mature dead child was found with its membranes in a membranous sac composed only of the Fallopian tube. The folds of the right broad ligament were separated from one another up to the point where the sac commenced which thus corresponded with the position occupied by the Fallopian tube, while a probe passed from the angle of the uterus into the sac along a short canal. The placenta was situated on the anterior surface of the cyst & death was due to separation of the placenta & haemorrhage into the sac, its rupture & peritonitis.

In Simpsons case (Ed. Obs. Trans 1876) the patient had had some pelvic pain about mid term & the foetal heart was heard faintly. At term false pains set in. When these passed off she missed the movements of the child. Three months later she died of peritonitis.

Interstitial Pregnancy is less frequent & less dangerous than the preceding. It is more likely to advance to term & the appearances described in the early months of pregnancy may persist to term without change except such as results from the increase in the size. Often however the rupture occurs during the first three months. After rupture of the tubal mucous membrane the ovum may remain between the separated muscular fibres of the uterus & gradually stretching the peritoneum as it enlarges may continue to develope up to the normal end of pregnancy; in other cases the rupture is the same as in the tube proper, the contents escaping into the peritoneal cavity.

A case is reported by Hicks (Lond. Obs. Trans 1868) where the uterine opening was so dilated that the foetus afterwards entered the uterus. Thomas reports a case where the foetus was destroyed by electricity & afterwards it discharged into the uterus & expelled through the natural passages.

Dr. Hodge (quoted from Parry) diagnosed a case of Interstitial pregnancy, cut through the layer of tissue which shut off the foetus from the uterus & delivered it successfully.

A supposed case of Interstitial Pregnancy with birth through the uterus is reported by Grüm (Lond. Obs. Trans 1885)

In Interstitial Pregnancy at full term a portion of the ovum may sometimes be found in the uterus while the remainder is in the abnormal tubal cavity e.g. the

head of the child has been found in the uterus while the body was in the tubal cyst: again we may have the child developed in the tube while the placenta is attached inside the uterus.

In Tubo-Ovarian Pregnancy the sac is much more distensible & the gestation may continue without laceration to a more advanced period or even to term, the case then resembles one of abdominal pregnancy.

Side of the Pregnancy. Barnes says that in a considerable majority of cases it is the left tube which is the seat of the gestation. Penny, Campbell & Hecker agree with him. He supposes this due to the fact that the left tube is more liable to displacements & compression by the sigmoid flexure of the colon which lies in close relation to it & is often distended by faeculent accumulations. It is a curious fact that in diseases of women the left side is more commonly affected than the right e.g. phlegmasia dolens in the left leg, laceration of the left side of the cervix, pelvic cellulitis of the left side &c.

II. Abdominal Pregnancy.

In Primary Abdominal Pregnancy when the impregnated ovule drops into the peritoneal cavity & survives, the chorion is unsupported during the earliest stages of the pregnancy by any other tissue. It projects uncovered into the peritoneal cavity excepting on that part of its surface by which it

becomes united to the serous membrane. Villi form on the chorion, attach themselves to the surrounding structures and eventually develope into a placenta. The mode in which the chorion villi are attached & the arrangement of the maternal blood vessels is not known but probably it is similar to that described in tubal gestation. The precise seat of attachment varies, most frequently it is in the Pouch of Douglas but the placenta has been found attached to most of the abdominal viscera.

In Secondary Abdominal Pregnancy the ovum during the earlier months is attached to the tube or ovary. When rupture of the tube takes place & the patient survives, the membranes may either remain entire & be developed with the foetus, or, they may rupture remain attached to the sac & the foetus will then lie loose in the abdominal cavity. In the former case the ovum becomes attached to the peritoneum & developes a placenta; in the latter case the placenta retains its old attachment to the inner surface of the tube which becomes everted, and it likewise acquires new attachments as it grows, to the front of the rectum, ovaries, various parts of the peritoneal surface & even to the small intestine. Wherever the placenta is attached it shows great power of development & induces an enormous enlargement of the vessels in the neighbourhood These vessels are more like sinuses than ordinary vessels, their walls are very thin & have no distinct muscular

layer, a fact which at once explains the disastrous results which have followed attempts to remove the placenta in operations for extra-uterine gestation, the haemorrhage being quite uncontrollable. The subsequent changes of the ovum (whether the gestation is primary or secondary) vary much. In the majority of cases it contracts adhesions to form a sac & as it grows these increase until a considerable portion of the neighbouring organs may become united to the chorion. As the ovum commonly falls into the Pouch of Douglas the uterus & its appendages are nearly always adherent to the Chorion. In Isaacs case however (Lond. Obs. Trans. 1876) upon opening the peritoneum no trace of a cyst or membrane could be found "the child had lodged in the middle of the bowels free in the cavity of the abdomen." Parry says the process by which adhesions are formed is probably not absolutely inflammatory but is analagous to those vital nutritive changes by which the ovum attaches itself to the lining membrane of the uterus in normal gestation. The walls of the sac are not generally very vascular but large vessels may ramify over them.

As there is plenty of space for the development of the ovum & as the secondary cyst generally stretches & grows along with it, most cases of abdominal pregnancy progress without any marked symptoms beyond

occasional severe attacks of pain until full term of pregnancy has been reached. Very rarely the sac ruptures prematurely & there is an escape of blood into the abdominal cavity which may cause death of the patient, but usually she recovers from this & the foetus dying undergoes changes similar to those occurring in cases progressing to full period.

In extra-uterine gestation there is nothing abnormal or peculiar in the appearance of the ovum itself, it grows & develops in its abnormal position with the same vitality as when it has reached the interior of the uterus. The exact relations between the maternal & foetal circulations are not known. In the early stages the villi of the chorion adhere & do not penetrate the mucous surface.

In the later stages the child may lie in any position in the sac. In Mrs Boon's case it was at one time transverse & afterwards assumed an oblique position with the head below the ribs on the left side & the breech in the right iliac fossa. In other cases it has been found in its normal position with its head in the pelvis or on the brim. The development of the child varies greatly, in the case of Mrs Boon it was somewhat under weight. 5 lbs but it was 20 inches long; other cases are recorded where it has exceeded the usual size as 8½ lbs, and in one case (quoted by Parry) 11½ lbs, where the patient

died one year after completion of term. Extra-uterine children frequently die before term, but the rule is for them to live until the end of the ninth month if the gestation is not terminated by rupture during its early stages. Playfair says it has sometimes apparently lived for several months after the natural limit. Schroeder thinks it is not probable the foetus should be alive more than 10 months in the abdomen of the mother.

The umbilical cord is almost always normal in its function. The placenta varies greatly, it is often very broad as it is attached to structures which are not naturally very vascular & thus its extent makes up for this deficiency. It may be attached to any portion of the peritoneum or within the ruptured foetal cyst whether it is tubal or ovarian or it may be in the uterus itself. In Jessop's case (already quoted) on tracing the umbilical cord "the placenta having a larger superficial area than natural was seen covering the inlet of the pelvis like the lid of a pot & extending some distance posteriorly above the brim where it apparently had an attachment to the large intestine & posterior abdominal wall. Near its centre was a round prominence which seemed to correspond with the swollen fundus of the uterus beneath."

Twins are more common in extra-uterine gestation than in normal pregnancy. They may be both extra-uterine or one extra- & one intra-uterine. The proportion of

the sexes remains the same as in normal pregnancy. Monsters are rarely met with in extra-uterine gestation Duncan (Med. Times & Gazette 1872) describes a case where the childs abdominal walls were imperfectly developed.

The Uterus in Extra-uterine Gestation. The condition of the uterus in extra-uterine gestation has been a subject of much discussion but is generally admitted to become enlarged & more vascular. The cervix is softened as in natural pregnancy, often patulous especially towards the later months of gestation. Tait says the cervix is always quite open, in his cases admitting the finger. Within the cervical canal the glassy mucous plug forms as in normal pregnancy. The mucous membrane of the uterus hypertrophies & develops into a true decidua which may be retained in the uterus till full term & be thrown off during pseudo-labour, but generally it is discharged in the early months of pregnancy either entire with all the symptoms of abortion, or in small fragments with the haemorrhages which are so common in extra-uterine gestation. This explains its absence in many cases examined post-mortem. The uterus is also found more or less displaced generally forwards & to one side the cervix being carried towards & above the pubis. In Barbours case (Edin. Obs. Trans 1882) it lay along the anterior wall of the cyst & measured $5\frac{3}{4}$ inches long,

the fundus being 5 inches above the symphysis & the cervix was drawn up so that the fornices were obliterated. The size of the uterus at term is not often larger than that of the fourth or fifth month of pregnancy & at this time rarely contains a decidua as it has been thrown off before the death of the patient occurs.

The Corpus Luteum in extra-uterine gestation is formed as it is in normal gestations & does not differ from that found in the ovary of women dying during uterine pregnancy. Several curious cases are recorded in which a tubal pregnancy existed while the corpus luteum was on the opposite side. The view of Oldham is generally accepted to explain this - that the fimbriated extremity of the tube in which the ovum was found had twisted across the abdominal cavity and grasped the opposite ovary & in this way the ovum passed into the tube. Kussmaul says it is not necessary for the fimbriated extremity & the ovary to be brought together in order that the tube should receive the ovule. He believes that in the human female, as in amphibians, the germ has to traverse a portion of the peritoneal cavity in order to reach the tube. An intra-peritoneal current has been described which constantly flows from the ovary to the pavilion of the tube & it is probably carried by this current. That a current does exist is

very possible as the cilia in the tube are constantly waving towards the uterine cavity & would thus tend to produce such a current. In these cases the cause of the ovum developing outside the uterus may be due to a flexion produced in the twisted tube which prevents the ovums onward passage. Tyler Smith's explanation is that the ovum passes down the Fallopian tube on the same side as the corpus luteum & into the uterus & there failing to become attached to the mucous membrane finds its way into the opposite tube. Huschka reported a case in 1863 where the cyst was in a rudimentary horn of the uterus while the corpus luteum was in the opposite ovary. No communication could be found between the sac of the rudimentary horn & the cavity of the developed half of the uterus, so that passage of the ovum across the uterine cavity may be excluded in this case. Burton (Lond. Obs. Trans. 1881) mentions a case where the cyst was developed in the right Fallopian tube, & the left ovary contained the corpus luteum; the right ovary contained no ovisacs & was streaked. He makes no remarks about the relation of the tube to the ovary.

Terminations of cases that advance to term.

In most cases at the natural termination of pregnancy a false labour comes on, there are more or less frequent strong & regular contractions of the uterus often accom-

panied with an escape of blood from the vagina + pieces of broken down decidual membrane from the uterus if this has not been expelled previously. After a variable time the labour ceases + the foetus dies. With the death of the foetus the secretion of liquor amnii ceases and it becomes partially or entirely absorbed. The now dead foetus undergoes various changes. It may (1) remain unaltered + that too for a considerable time. Playfair describes a case where it remained 52 years + was found to be "fresh + unaltered as a new born child". (2) the liquor amnii is absorbed, the cyst walls contract, the foetus shrinks + all its soft structures are changed into adipocere, the bones only remaining unaltered. This may occur very rapidly - in less than a year in a case of Playfairs. (3) the fluids are absorbed, the foetus is greatly compressed + is converted into a hard mummified mass. (4) the sac + its contents atrophy + shrink + lime salts are deposited in them, the whole being converted into a solid mass known as a lithopaedion. Deposit of calcareous (sometimes cartilaginous) matter in the walls of the cyst is not uncommon when the child has been carried for a long time but it is rare to meet it in the child itself.

Under any of the above circumstances the foetus is converted into an innocuous mass which may remain

in the mothers abdomen for an indefinite period without producing any serious discomfort, & in many cases of this kind several normal pregnancies and deliveries have subsequently taken place. Johnston reports a case (Med. Times & Gazette 1872) where the patient carried an extra-uterine foetus for 44 years & it was then discharged by the rectum. Chiari (Lancet 1876) mentions a case where the foetus was carried 50 years.
The cases however in which the retained foetus gives rise to no mischief are quite exceptional. Generally we get (5) Inflammation & suppuration of the sac, the body of the dead foetus setting it up through irritation. The inflammation may spread causing general peritonitis & death of the mother, or death may result from septicaemia. If she escape these the inflammation leads to adhesions which shut off the cyst from the general abdominal cavity, the pus burrows in various directions & opens externally, it may be through the abdominal wall, into the bladder, vagina or alimentary canal - generally the sigmoid flexure of the large intestine or the rectum -. Parry says it is most frequently into the intestinal canal, next through the abdominal wall & last through the vagina & bladder. Mattei says through the abdominal wall is most frequent, next the bowels bladder & vagina. One or more fistulous

openings are thus formed through which there escapes pus + the bones & other parts of the broken down foetus. This may go on for months or years until the whole contents of the cyst are expelled + recovery takes place or it may cause the death of the mother from exhaustion or septicaemia. In some cases rectal, faecal, vesical or vaginal fistulae remain. The time at which the sac may thus open varies greatly, Parry says it is most frequent between the first + sixth months + between the first + second years after the completion of the ordinary term of pregnancy but it may be as late as 30 or more years. Carter (Lond. Obs. Trans 1880) relates two cases, in the first case suppuration occurred 4 months after the death of the foetus + opened first through the abdominal wall close to the umbilicus + afterwards through the vagina; in the second case the foetus died at the 6th month + not until 6 years afterwards did suppuration occur when it was discharged by the rectum. Both cases recovered. Freund (Edin. Obs. Trans 1882-83) relates a case of elimination by the vagina, the patient had carried the foetus for 9 years when she again became pregnant + at term was delivered of a fully developed dead child. During the puerperium severe troublesome pain in the back + protracted blood stained discharge took place; 6 months later a fragment of bone was

expelled from the vagina, the remainder was removed by dilating the fistulous opening. Patient recovered.
The chances of recovery are best when the cyst opens through the abdominal walls, next through the vagina or bladder & best favourable when it takes place by the bowel. In a few cases the child has been expelled entire through the bowel, it has also been forcibly extracted by the accoucheur through the same channel.

Etiology.

Extra-uterine gestation is a rare disease. Bandl mentions that out of 60,000 obstetric & gynecological cases at Vienna it only occurred in five cases. In a general way it may be stated that anything which prevents the ovum from reaching its normal site for development in the cavity of the uterus, & yet does not prevent the access of the spermatozoa to the ovule should be looked on as a cause. Thus it may be from inflammatory adhesions from old standing peritonitis pressing on the tube.
Oldham (Guys Hospital Reports) describes a case where the gravid sac was found at the distal end of the tube while close to the uterine end of the sac the tube was constricted by an inflammatory band which was wound round it like a ligature. In many cases of extra-uterine gestation we find there is a history of a previous peritonitis. An inflammatory thickening of the coats of

the tube may also be a cause by lessening its cavity & preventing the ovum passing along to the uterus altho' it does not prevent the spermatozoa getting up. Tumours of the uterus & surrounding organs may constrict the tube by pressure upon it. The lumen of the tube may be obstructed by inspissated mucous or a tumour. Breslau in 1864 (Brit. & For. Med. Chir. Rev.) describes a case of Interstitial Pregnancy which he considered due to a small mucous polypus obstructing the uterine end of the tube. Destruction of the ciliary action of the mucous membrane of the tube from catarrh may be a cause as the onward course of the ovum is in a large measure due to it. Moral & mental influences are supposed causes, such as fear of discovery in the practice of illicit intercourse, fright during or shortly after coition: Spasm of the Fallopian tubes may thus be produced which either interfere with the passage of the ovum or direct it into the abdominal cavity. Freund (Edin. Ob. Trans 1883) relates a case where the patient had had coition only once & this was disturbed by a sudden fright. In the next few days attacks of giddiness, general depression with frequent severe abdominal pains set in. The gestation went to term.

Injuries such as blows in the pelvic region received about the time of conception may prevent the ovum reaching the uterus. Parry reports a case of Jackson's

who believed the ovum was arrested in the tube by peritonitis induced by a blow a week after intercourse. Barnes believes that women who have to work hard are more liable to this form of gestation. Parry also remarks that the most curious examples of extra-uterine gestations which occurred in America were met with in negro women of the Southern States while in a state of slavery.

Spasm, paralysis, too great relaxation & inaction of the muscular fibres of the Fallopian tube have been supposed causes. Malformation of the internal genital organs may be causes as the Fallopian tube entering the uterus at some point on the body or even the cervix. In Haydon's case (Lond. Obs. Trans 1863) the right tube passed from the uterus 1½ inches below the fundus; while that of the left at only ¾ of an inch, which gave the appearance as if the right tube arose from the middle of the uterus. In Meadows case (Lond. Obs. Trans 1876) the Fallopian tube of the affected side joined the uterus at some distance from the fundus seemed to be the cause of the extra-uterine gestation by obstructing the passage of the ovum along the tube. Hernia (inguinal, crural or abdominal) of some portion of the internal genital organs may be a cause. Displacements of the uterus may lead to it as prolapsus uteri which interferes with the calibre of the tubes, or retroflexion as in a case described by Meadows (Lond. Obs. Trans 1873)

Twin conceptions are about four times as frequent in extra-uterine as they are in normal gestations, one extra- & one intra-uterine being much more common than both extra-uterine. Barnes suggests that the two ova may obstruct each other in their descent to the uterus.

Extra-uterine gestation is more common in multiparae than primiparae. It may occur at any age but most frequent about 30. Of 500 cases investigated by Parry the youngest was 14, the oldest 47 at the time conception occurred & the greatest number were between the ages of 30 and 40. Bandl explains the relative greater frequency of extra-uterine gestation in older patients by the fact that catarrh of the tube (which produces adhesions with obliteration of the lumen) is more frequent in them.

A large proportion of cases occur in women who have either been previously altogether sterile or in whom a long interval of time has elapsed since their last pregnancy.

The frequency with which the different varieties occur varies. Parry from an analysis of 500 cases found 214 were tubal, 27 ovarian, 29 abdominal & 230 doubtful. Hecker considers abdominal the most frequent, next tubal & last interstitial.

Symptoms.

In the early stage - 4-12 weeks -. In the majority of cases, symptoms the same as those of normal pregnancy are present in addition to the special symptoms to be described. Menstruation in most cases ceases & the patient supposes herself pregnant, but this is not always so for many cases are recorded where menstruation has continued, although it may have varied in intensity, time & quality. In Burtons Case (Lond. Obs. Trans. 1881) two days before rupture, a 5 days menstruation had just ceased, again in Routh's case (Lond. Obs. Trans. 1879) menstruation was quite regular & the flow large. The breasts enlarge and the areolae darken. There may or may not be morning sickness, Tanner (Signs & Diseases of Pregnancy) says this is often absent & is seldom very severe. More frequently she is annoyed with diarrhoea & troublesome tenesmus as well as with irritability of the bladder. Freund (Edin. Obs. Trans 1882-83) says when the placenta is situated on a part of the intestinal canal, there is intense intestinal catarrh with severe colicky pains amounting to dysentery, at the beginning of the gestation; & if the foetus dies the sac decomposes (owing to its attachment to the bowel) & the whole system becomes affected.

In other cases there are none of these signs & symptoms present, the patient feels well, perhaps better than she has done for sometime, she may not even know she is pregnant. Usually about the end of the first month she has the first indication of something wrong in a sudden attack of pain in the hypogastrium, commonly called colick by her. This pain is agonising & is often accompanied with tenderness in the hypogastric & iliac regions. It may cause great prostration with clammy skin, feeble & rapid pulse, there may or may not be vomiting, sometimes it is so severe as to cause Syncope. It is paroxysmal in character & may last a few minutes or several hours, it then passes off & she gets relief, only to return however with more less regularity. She experiences these attacks of pain up till the time of rupture of the cyst, or if the child is carried to term they may continue to term, in other cases they cease after the 5th month not to return or they may return again towards the close of pregnancy as was seen in Meadows case (Lond. Obs. Trans. 1873) In Mrs Boons case pain was a constant symptom throughout, it was felt in the front of the abdomen & left side below the ribs. It came on about 10 p.m. & lasted till 4-5 a.m, she then had relief till the

afternoon when it returned for a few hours.
In other cases the pain instead of being paroxysmal is dull & grinding, fixed in one iliac fossa or extending down the thighs & as the pregnancy advances it may become paroxysmal. In some cases again the child may be carried to near term & no pain or unusual symptom experienced. Spiegelberg's patient reached the 9th month without any abnormal symptoms. These paroxysms of colicky pain are due to contractions of the foetal cyst & it may be pressure on neighbouring structures. Contractions can take place in a tubal cyst from the muscular fibres present & probably in cases where the pains are absent there are no muscular fibres in the sac. Barnes thinks they are due to peritonitis. This however seems disproved by Daly's case (Lond. Obs. Trans 1882) where there was intense pain increased by defaecation, difficulty in micturition & dyspareunia, Rupture occurred at the 3rd month & there was no trace of peritonitis. Dr. Heim of Berlin said there may be a characteristic whining tone of voice but this is not verified by other observers. Another important symptoms at this early stage is a discharge of blood from the vagina, this is usually metrorrhagic in character, occurring at uncertain & irregular intervals & may or may not

accompany the attacks of pain. Pieces of decidual membrane are often discharged with the blood or in some cases it comes away entire as a cast of the uterus & the condition simulates abortion. If this metorrhagia does not occur early it is likely to do so immediately before rupture of the cyst (Barnes). The cause of this haemorrhage is probably partial detachment of the chorion villi produced by the ovum growing out of proportion to the tube in which it is contained; separation of the decidua from the interior of the uterus is an additional cause.

On Vaginal Examination we may notice pulsation of vessels in the vagina as in normal pregnancy. The purple hue of the vagina & pudenda is often well marked; in a case recorded by Routh (Lond. Obs. Trans 1879) the right pudenda was so blue that it first suggested to him the idea of the patient being pregnant. The uterus is enlarged. At this early stage the enlargement is about the same as at the corresponding period of normal pregnancy, it is also displaced to one side or forwards, by a tumour which exists at one side or posteriorly to it, more rarely is the tumour anterior to the uterus pushing it backwards. It is often also lifted up in the pelvis so that the cervix is reached with difficulty. Beyond the change in position, there is

little change in the cervix itself at this time. Through the lateral & posterior fornices a tumour can be felt in many cases however it is difficult to detect anything owing to the tenderness of the parts. If a tumour can be felt it is as a rule nearly immovable, slightly sensitive on pressure, sometimes it is possible to make out ballottment & we may be able to detect the increased vascularity of the tissues around it. In Dr Routh's case this was very marked, he felt arteries beating in every direction whether he examined by the rectum or vagina. By dilating the urethra & introducing the forefinger of one hand into the bladder & forefinger of the other hand into the rectum the condition is made clearer. As the pregnancy advances these signs become more marked.

On or about this time in the majority of cases we get <u>rupture of the sac</u>. The patient may have shown the above symptoms, or she may have been entirely free from them or not even have known she was pregnant. Suddenly she is seized with agonising pain in the lower part of the abdomen & usually to one or other side & she has a feeling as if something had given way. This is frequently accompanied by a discharge of blood from the vagina. The pain gradually increases in severity up to a certain point & then

suddenly & completely subsides, the abdomen sinks & the tumour disappears (Tanner). The accumulation of blood in the pelvic cavity may give rise to a sense of fulness which can be felt thro' the vagina & behind the uterus. There may be frequently recurring attacks of syncope, in others none. She becomes prostrate, the skin cold & pale & covered with clammy perspiration, the pulse rapid & scarcely perceptible, the face has an anxious expression, vomiting is common & may be most distressing. Convulsions may occur accompanied with delerium or the mind may remain clear & usually death results from the shock and internal haemorrhage. To this assemblage of symptoms Barnes gives the name "abdominal collapse" He remarks that the injury sustained is compound, there is traumatic violence attending the rent, & the sudden impression upon the ganglionic nerve centres producing shock & the haemorrhage. He distinguishes this "abdominal collapse" from the collapse which attends sudden injuries in the head by the preservation of the mental faculties & from the like injury in the chest by the absence of the difficulty in respiration. Death may result in a few hours or she may survive the shock, reaction sets in & she may imperfectly rally to be again prostrated by a

second escape of blood which proves fatal or she may escape this & live for several days & we get all the symptoms of acute peritonitis setting in - the abdomen becoming distended, tympanitic & tender, the pulse rapid the temperature raised. Barnes, Tanner, Playfair & Schroeder say this is acute peritonitis but Parry does not agree with them. After examining many cases he concludes that (1) Peritonitis is a rare sequel of rupture of the cyst & even when pain, tenderness & other symptoms supervene, of this affection, after the escape of the ovum they do not necessarily indicate the existence of inflammation. (2) Peritonitis so rarely follows rupture of an extra-uterine foetal cyst that the possibility of its occurrence need not be taken into consideration in the decision of any questions relating either to prognosis or to treatment. This opinion of Parry's is supported by the P.M. examination of some cases after rupture e.g. Routh's (Lond Obs. Trans 1879) case where "not a trace of peritonitis could be detected." also Meadow's case (Lond. Obs. Trans. 1876) where all the organs were healthy but pale. also Daly's case (Lond Obs. Trans 1882) where there was no trace of peritonitis.

If the patient should survive rupture of the cyst the case is transformed into one of abdominal pregnancy, the placenta may remain undisturbed after the rupture

or if the rupture occur early the ovum escapes & may attach itself to some portion of the peritoneum & there continue its development.

<u>In the later Stages</u>. After the 4th month there is quickening, the foetal heart is heard & that often with great distinctness, also the placental bruit. The enlargement of the abdomen becomes more visible, the breasts secrete milk & the areolae round the nipple are marked. There may or may not be metorrhagia. If the decidua has been expelled during the early part of the pregnancy the metorrhagia is apt to be absent during this stage. The abdominal pains are usually present but are not so severe & in some cases they may cease altogether. Very often the movements of the foetus cause pain, this was well marked in Mrs Boon's case & that of Scoop (Lond. Obs Trans. 1876). Pressure symptoms may be present e.g. on the bladder causing dysuria or retention; on the rectum causing difficulty of defaecation or complete obstruction. Duncan relates a curious case (Med. Times & Gazette 1879) where 4 months after arrest of menstruation the patient had bearing down pain & difficulty & pain in micturition & defaecation. The urine was larger in quantity & voided more frequently than usual with her. The catheter had to be passed & instead of giving relief it caused violent strangury.

At or near term the child dies; immediately before death it often makes violent movements which may cause great pain. In most cases there is a spurious labour.

Physical Examination. The abdomen is enlarged & that mostly on one side; the umbilicus is often drawn in (Barnes). On Palpation we find it differs from that of normal pregnancy in being developed more in a transverse direction than a vertical & the rounded outline of the gravid uterus cannot be detected. In many cases however we can make out the uterus enlarged & forming a separate tumour generally on the side opposite to that on which the child is developed; in other cases it can't be palpated either owing to the tenderness present or to its being in some other position as lying flat along the surface of the tumour (Barbours case) or retroflexed as in two of Freunds cases (Edin. Obs. Trans 1882-83) Often the different parts of the foetus are felt with more than usual distinctness, in other cases not.

On Vaginal Examination the cervix is softened & usually displaced forwards & to one side & as the uterus is frequently raised up in the pelvis it is often felt immediately above the symphysis pubis in contact with the anterior abdominal wall. The state of the os varies, Tait says it is always quite open, in his cases admitting the finger. The uterus may be movable or fixed by peri-metric adhesions

it is enlarged & usually seperate from the tumour, this enlargement however is not in proportion to the duration of the pregnancy. Through the posterior fornix of the vagina a tumour can be felt which may completely fill the pelvis, it may be firm or fluctuating & we may get ballottment, sometimes parts of the foetus can be distinctly felt in it. By introducing a sound into the bladder we can make out if it is displaced, it may be pushed to one side or drawn upwards & become adherent to the anterior abdominal wall. It is important to decide whether the uterus is empty or not, this can only be done by passing the sound or introducing the finger under chloroform. Examination by the rectum is also valuable to make out the position of the tumour more clearly.

When the pregnancy goes on to term <u>false labour</u> generally comes on. There are regular & strong uterine contractions usually accompanied with an escape of blood from the vagina & also decidual membrane if it has not been expelled before. These spurious labour pains continue at intervals till the foetus dies from effusion of blood into the placenta or it may be from pressure. The duration of the false labour varies from a few hours up to 2-3 weeks & is followed in many cases for a few days by a discharge which resembles the lochial

discharge of normal pregnancy. Lactation is often established, the milk is of its normal quality & the quantity is the same as after natural labour. It may last only a few days or for the normal period of lactation.
Sometimes the contractions of the abdominal muscles produced by this labour have caused laceration of the cyst round the foetus & escape of blood & liquor amnii into the abdominal cavity speedily leading to the death of the patient. If rupture does occur at this time, Parry says it is generally into the vagina, rectum or uterus & not the abdominal cavity. Rupture at this period is rare, the usual course is for the foetus to die and then it undergoes the changes already described under Pathology.
After the death of the foetus the abdomen diminishes in size from the absorption of the liquor amnii and shrinking of the tumour. As long as the patient carries the child she is never safe. Attacks of peritonitis are common but are generally not severe, tending rather to cause adhesions between the sac & the abdominal wall or the internal organs.
When <u>Suppuration</u> occurs in the cyst & elimination takes place by the abdominal wall, the skin becomes red, an abscess forms which bursts & pus escapes & later the pieces of the broken down foetus. If it occur by the bowel there is diarrhoea or some

difficulty & pain in defaecation, tenesmus, perhaps obstruction of the bowel, then a foul discharge mixed with blood & afterwards the bones of the foetus. When it opens into the bladder she has all the symptoms of stone. If by the vagina there is inflammation & foetid discharge & later the foetus.

Discharge by these channels may lead to the formation of various fistulae e.g. faecal, vagino-rectal, vagino-vesical vesico-abdominal. During the discharge of the foetus there is hectic fever, anaemia, night sweats, exhaustion & the patient may die under it, or all may be eliminated & she recover completely.

<u>Twins in Extra-uterine Gestation.</u> The usual condition is for one child to be developed inside & one outside the uterus, both outside the uterus is rare. Of the former condition Parry found 21 examples in 500 cases of extra-uterine gestation examined by him; of the latter condition only 2 in the same number of cases.

The presence of intra- & extra-uterine pregnancy does not increase the risk to the mother. Both children may be carried to term & the uterine one be born in a natural manner, or it may die & be discharged early in the pregnancy & the extra-uterine one develope to full term. A case of intra- complicated with extra-uterine gestation is recorded by Pennefeather

(Lancet 1863) the uterine child was born at full term, the extra-uterine child being later discharged through the vagina. More recently a case is reported by Galabin (Lond. Ob. Trans. 1881) Patient was 36 years & had one child one year old. Physical examination showed the abdomen distended by two tumours with a distinct sulcus between them. Fluctuation was felt in both. Foetal movements felt & heart heard in the left, nothing in the right. The diagnosis was ovarian tumour and pregnancy. Two weeks later the examination showed that the outline of the right tumour had disappeared & fluctuation was felt all over the abdomen with increased swelling. Considering it a case of ruptured cyst (ovarian) he operated. Blood was found in the peritoneal cavity & the extra-uterine foetus enclosed in its thin membranes lying to the right side & somewhat behind the uterus. The placenta was attached chiefly to the posterior surface of the right broad ligament & of the pregnant uterus. The child was dead. The cord & a drainage tube were left in the wound. Two days later labour pains came on & the uterine child delivered a breech, the placenta following immediately. There was little bleeding from the vagina but a great deal through the drainage tube which continued till next day & caused death. This was

probably due to separation of the extra-uterine placenta by the contraction & diminution in size of the uterus after labour.

Pregnancy may occur while the patient is carrying an encysted extra-uterine foetus. The gestation may go on to full term and natural labour follow. Cases are known where a patient has had a second & even several children while carrying an extra-uterine foetus. The patient is always in danger however of (1) premature expulsion of the foetus, from the uterus not having sufficient space to develope (2) rupture of the uterus during labour from the extra-uterine cyst blocking the pelvis. (3) inflammation being set up in the sac or surrounding structures from the pressure of the growing uterus or the pressure during labour.

The question has been raised, Can a woman become pregnant with an intra-uterine child during the first 9 months after an extra-uterine conception? This seems possible as the cavity of the uterus never becomes closed in extra-uterine gestation, the decidua reflexa not being formed & the canal of one Fallopian tube at least may remain patulous; also twin pregnancies are more common in extra-uterine than in normal gestation, in the majority of which one ovum is developed inside & one outside the uterus. Parry is of opinion

that impregnation does not occur in extra-uterine gestation during the normal period of gestation & not until the woman regains her natural condition, & those phenomena which belong to the pseudo puerperal state have disappeared.

A case is related by Prof. Simpson (Edin. Obs. Trans. 1876) where the patient carried the extra-uterine foetus for 10 years & gave birth to two children, the first, seven years after the false labour, the second, three years later. After this one she died & the extra-uterine cyst was found communicating with the rectum & containing faecal matter. Freund also relates a case (Edin. Obs. Trans/82)

Repeated Extra-uterine Gestation. Pregnancy may occur more than once in the same patient. Haydon reports a case (Lond. Obs. Trans 1864) A young woman became pregnant & was supposed to have aborted but no foetus was seen. At that time she was seriously ill. Four to five years later she again became pregnant and six months afterwards died with symptoms of rupture of an extra-uterine cyst. On P.M. a cyst was found in the right Fallopian tube which had burst and allowed a three months foetus to escape; & attached to the edge of the tear was a small irregular solid mass which proved to be a small foetus packed very tightly within a membrane. The conclusion drawn was that the

patient had had two distinct tubal gestations, that the first ended in rupture, that the second occurring some years afterwards ended by fatal rupture of the sac, six months after conception, the embryo having died three months before the rupture. This case also proves that rupture of a tubal cyst is not necessarily fatal.

Diagnosis.

The diagnosis is surrounded with great difficulties. During the early stages if the patient (1) supposes herself pregnant & shewed gastric & mammary symptoms of pregnancy (2) have passed two or three periods without menstruating (3) had paroxysmal attacks of severe pain in the lower part of the abdomen at one or other side (4) if this was accompanied with discharge of blood from the vagina, perhaps also decidual membrane (5) enlargement of the uterus (6) presence of a rapidly growing pelvic tumour displacing the uterus (7) perhaps ballottment in the tumour (8) purple line of the vagina, we have strong suspicion that the case is one of extra-uterine gestation and if following these there are the symptoms of rupture of the cyst, the patient should be treated as if she suffered from extra-uterine gestation.

The conditions most likely to be confounded with extra-uterine gestation are the following –

(1) Haematocele (2) Pelvic inflammation
(3) Encysted Abscess of Broad ligament or pelvic peritoneum.
(4) Pregnancy in the rudimentary horn of a bi-lobed uterus.
(5) Normal Pregnancy (6) Pseudo-cyesis
(7) Retroflexion of Gravid Uterus (8) Fibroid tumours of uterus. (9) Ovarian tumours.
(10) Cancer of peritoneum or pelvis (11) Irritant poisoning.

I Haematocele. Diagnosis from this may be impossible in some cases e.g. when the patient has not known she was pregnant & shown no symptoms of it, rupture of the cyst being the first indication, but even in these cases on careful bimanual examination we may find the uterus enlarged, pointing to extra-uterine gestation. In other cases we may be able from the previous symptoms colicky pain, vaginal discharge & early symptoms of pregnancy to suspect it is due to extra-uterine gestation. After effusion of blood in a simple haematocele there ensues, unless fresh haemorrhage occur, hardening & absorption of the mass or suppuration. In Extra-uterine gestation when the patient has rallied from the effect of the rupture, the effusion rarely becomes encysted & the foetus may survive & go on developing.
II. Pelvic Inflammation. Here the clinical history is important, there are no symptoms in pelvic in-

flammation like those described in extra-uterine gestation. The woman herself does not think she is pregnant. The pain may be somewhat paroxysmal but this occurs at the menstrual periods. Again a pelvic inflammatory deposit has not the same defined outline as an extra-uterine cyst.

III. Encysted abscess of broad ligament or pelvic peritoneum. Tubal pregnancy is distinguished from this by its smoothness, uniformly rounded or oval form & its mobility & that its long axis is parallel with Poupart's ligament; in addition we may be able to make out ballottement in the extra-uterine cyst- while in the abscess we only get fluctuation.

IV. Pregnancy in the rudimentary horn of a bi-horned uterus. It is impossible to diagnose this. It pursues much the same course as a tubal pregnancy & generally ends in rupture although at a later period. The indications for treatment are the same in both cases.

V. Normal Pregnancy. (1) In extra-uterine gestation in the early stage we get the colicky pain & vaginal discharge in addition to the ordinary symptoms of pregnancy.
(2) the uterus in extra-uterine gestation is felt distinct from the tumour in many cases & is often fixed.
(3) In normal pregnancy the uterus occupies the middle line while in extra-uterine gestation the tumour is

at one side or more or less transverse (4) the different parts of the foetus are much more distinctly felt through the abdominal wall in extra-uterine gestation than in normal pregnancy. (5) On vaginal examination there is a swelling in the Pouch of Douglas in extra-uterine gestation, none in normal pregnancy; if the child is lying transversely the swelling fluctuates, if the head or breech present we may be able to feel them through the vaginal wall (6) the cervix is displaced forwards, laterally & upwards in extra-uterine gestation reached with difficulty, in normal pregnancy it is in the axis of the pelvis; also it is firmer & the os less patulous than in normal pregnancy (7) On introducing the sound into the uterus in extra-uterine gestation, its cavity is empty & its length is not in proportion to the duration of the pregnancy. (8) If extra-uterine gestation goes on to term we get a false labour with bloody discharge from the vagina.

VI. Pseudo-Cyesis or Spurious Pregnancy. It resembles extra-uterine gestation in its probably terminating in a false labour, but signs of ordinary pregnancy are absent or erratic in their mode of onset. The abdomen is tympanitic throughout & under chloroform the swelling disappears, if the Bimanual Examination is now made the uterus is felt to be normal in size & the cervix

unaltered.

VIII. Retroflexion of the Gravid Uterus. In this the first symptom usually noticed is retention of urine about the 4th month while in extra-uterine gestation we get the colicky pains & vaginal discharge & retention is rare. (2) On examining the abdomen in Retroflexion of the Gravid Uterus we find the bladder distended & forming a central pyriform tumour with distinct fluctuation & when emptied with the catheter no other abdominal tumour is felt; while in extra-uterine gestation this distension of bladder is rarely met with but there is an abdominal tumour more or less firm situated to one side of the middle line & separate from it we may feel the uterus (3) On vaginal examination in Retroflexion of the Gravid Uterus we feel a firm elastic swelling in the Pouch of Douglas which is continuous & movable with the cervix & we can't make out the fundus above the pelvic brim. In extra-uterine gestation the tumour felt is often fluctuating & distinct from the uterus (4) In Retroflexion of the Gravid Uterus there are alternate contractions & relaxations felt (this is more distinct on rectal examination) & on vaginal auscultation the uterine bruit is distinct, while in extra-uterine gestation there are no contractions felt & probably a bruit will not be heard.

(5) In Retroflexion of the Gravid Uterus on pressing the uterus upwards & to one side we may be able to undo the flexion & the uterus is then felt through the abdominal wall, the tumour disappearing from the Pouch of Douglas.

Diagnosis of Retroflexion of the Gravid Uterus from extra-uterine gestation is sometime very difficult. Dr. Barbour relates a case (Edin. Obs. Trans 1882) where he was unable to say positively which of the two it was. The patient had two months amenorrhoea then irregular haemorrhage from the uterus; there was no history of rupture of the sac; the foetal movements had never been felt & auscultation gave negative results. Pressure symptoms appeared at the 4th month as in Retroflexion of the Gravid uterus & after drawing off ℥100 urine a tumour was felt impacted in the pelvis. After death it was found the uterus was taken up, as it were, into the wall of the sac so that the latter simulated an enlarged uterus. After death of the foetus, the placenta had continued to grow & led to fatal haemorrhage.

VIII. Fibroid Tumours. When small they are distinguished from extra-uterine gestation by being hard & solid. Usually the difficulty arises after the death of the child, it may be many years after. History is very important. In extra-uterine gestation

we find the patient still clings to the idea she carries a child in her abdomen, she describes more or less accurately the symptoms of extra-uterine gestation followed by a spurious labour at term with discharge of blood from the vagina, cessation of foetal movements secretion of milk & afterwards diminution in the size of the abdomen which continued steadily until the tumour reached the size it is when the patient comes under observation. In fibroid tumours none of these symptoms have been present. The rate of growth does not correspond with that of a pregnancy normal or extra-uterine. The history is rather that of menorrhagia than amenorrhoea. There is no false labour at the end of 9 months & the tumour instead of diminishing then, steadily increases.

Dr. Meadows reports a remarkable case (Lond. Obs. Trans. 1874) showing the difficulty in diagnosis. The patient thought that 16 years ago she became pregnant; she had all the usual symptoms precisely the same as she had had in former pregnancies, the only difference she remembers was that the movements of the child were extremely free & painful. In due time labour pains came on & continued at intervals for 2-3 months then ceased & she relapsed into her former normal

condition. After the supposed labour however the abdominal swelling did not diminish but rather increased during the next three months. She came under his care on account of pain in the tumour & increase in its size as the result of a blow on it from a fall. The tumour was about the size of pregnancy at term ovoid in shape, extremely tender to touch all over, apparently solid dull on percussion over it but resonant in the flanks. On vaginal examination the uterus was high up and immediately behind the symphysis pubis, the cervix small & the os represented by a small circular pin Sound passed into the uterus 2½ inches. Tumour could with difficulty be felt per vaginam. An exploratory incision was made in the middle line of the abdomen & a white friable mass having all the characters of malignant disease was exposed so he did not proceed further. Patient died 53 hours later. On P.M. it was found to be a fibro-cystic tumour of the uterus adherent to all the surrounding structures, the friable mass being omentum which overlapped the tumour was about 1 inch thick. The uterine cavity measured in reality 5½ inches; during life the sound was obstructed by an encroachment of the tumour at the upper part of cervix.

IX. Ovarian Tumours. Diagnosis here is somewhat similar to that described under fibroids. The history of the case is important. As the tumour enlarges we get negative signs of pregnancy — the uterus is not enlarged, menstruation is not arrested, the characteristic line of the vagina is wanting — & fluctuation in it is usually distinct. On Vaginal examination there is frequently a swelling in the Pouch of Douglas which may be fluctuating or elastic & somewhat firm but there is no ballottment. The uterus is not enlarged. Ovarian tumours are occasionally irregular in shape & present hard projections which may be mistaken for foetal limbs. In many cases an exploratory incision is necessary to make diagnosis clear. Tait relates a case (Lond. Obs. Trans. 1874) in which he mistook a multilocular ovarian tumour for extra-uterine gestation. The patients statement was that the tumour had existed about 3 years, before that, menstruation had stopped for 8 months & her abdomen had slowly enlarged & also her breasts. Pains like those of labour came on & lasted 4 hours. The weak points in the history were no accompanying vaginal discharge & after the pains ceased her size remained unaltered.

Sometimes after spurious labour in extra-uterine gestation the abdomen does not diminish in size

& may even steadily continue to increase from an increase of the fluid in the cyst & thus simulate ovarian dropsy. Hutchinson (Lancet 1873) describes a case of this; the tumour fluctuated freely but felt firmer at some parts than others. No foetus could be made out. To make diagnosis clear he tapped. Later the patient died & on P.M. fluid from the cyst was found in the peritoneum. In his remarks on this case he says he does not recommend tapping but in a similar case if he could not feel the foetus for fluid he would get the patient on her hands & knees & examine the abdomen, & would probably feel the foetus which would fall forwards. In
In doubtful cases the trocar has been used to draw off some of the liquor amnii to confirm the diagnosis. Parry says it cannot be too strongly condemned as few women have long survived its use, peritonitis, collapse or septicaemia setting in; it is only to be used if we are prepared to perform gastrotomy at once if the fluid withdrawn is found to be liquor amnii. Playfair says it is difficult to imagine a fine hair like aspirating needle rendered perfectly aseptic by carbolic acid could have any injurious effects.

X Cancer of Peritoneum or Pelvis. Cancerous deposit- may assume various shapes & present irregularities of surface which resemble very closely portions of a mature foetus. Thorburn (Diseases of Women) says "I have found the cephalic structures & the contour of the ribs or of the extremities most accurately imitated in this way on abdominal palpation or vaginal touch, far more than by any other abnormal affection". A careful enquiry should be made into the family history & the history & progress of the tumour. The increase would probably be steady if a rapid accession to the fourth took place, a temperature chart would settle the difficulty, for the only condition which could induce rapid increase of the cyst of an extra-uterine gestation is suppuration & this would tell its story on the chart in lines that could not be mistaken (Tait)

XI Irritant Poisoning. The abdominal pain & vomiting which accompany rupture of the sac have led to suspicion of Irritant Poisoning. Dr. Wilson reports such a case in the Edin. Obs. Trans. 1879. In diagnosing extra-uterine gestation from Irritant Poisoning we should notice when she took food & if any other person was affected who ate with her. Diarrhoea & vomiting are almost always present in Irritant Poisoning, they

are not so constant in extra-uterine gestation. The important points are the unusual pallor & the haemorrhage from the vagina which are almost always present in rupture of the sac, while they are not marked or absent in Irritant Poisoning. The history of the case is also important as she will probably have suffered from the early symptoms of extra-uterine gestation.

Thomas in speaking of the difficulty of diagnosing extra-uterine gestation says "Very often we hear of Physicians being blamed on account of failure in diagnosis in these cases which suddenly die from rupture. Every medical man who countenances such a charge demonstrates his want of experience or his want of professional loyalty by so doing. Very often there is nothing in these terrible cases to create suspicion; very generally nothing to decide us positively even when suspicion is excited." Thorburn says, Granted an absolutely certain pregnancy with very strong suspicion of it being extra-uterine, the probabilities are nevertheless very greatly in favour of its turning out to be intra-uterine.

Diagnosis of the Varieties of Extra-Uterine Gestation.

It is almost impossible to do so. The Interstitial form is very rare, the tumour consists of an irregular

enlargement of the uterine body, it moves with the uterus while at the same time that organ is empty. In the tubal variety there is a tumour at the side of the uterus, somewhat separated from it & not decidedly moving with it. In most instances it gives rise to severe paroxysmal pain & metrorrhagia. Ballottement is more readily detected in it than in the other forms. In the abdominal, if the gestation follows a comparatively normal course to term it is probably this variety of extra-uterine Gestation. Ovarian Pregnancies Freund says (Edin. Obs. Trans 1882-83) commence without pain or only moderately painful sensations, with a rapidly growing tumour like an ovarian alongside of the uterus which enlarges but remains flat.

Prognosis.

Is always grave. It is least favourable in the purely tubal variety which in the majority of cases is fatal by rupture; more favourable in the interstitial form as the cyst may sometimes open into the uterus; most favourable in the abdominal variety as here there is room for the foetus to grow. Freund says prognosis is very serious when the placenta is attached to the bowel as decomposition is readily set up if the foetus dies & demands the speedy opening, evacuation & disinfection of the sac. Prognosis also depends on the stage of

gestation, being much graver in the first than in the latter half of pregnancy. If the patient passes mid-term without rupture she will probably go to term. After false labour, death of the child & normal condition of the system is restored the patient may live for many years but she is always in danger so long as she carries the encysted child. Prognosis is more favourable when adhesions has occurred between the sac wall & the parietal peritoneum; less favourable where no such adhesion exists. When the cyst suppurates & is discharged it is more favourable when through the abdominal wall than through the vagina or bladder & least favourable when through the rectum. A patient with an encysted child may become pregnant one or more times & be safely delivered but she is always in danger, it may be during pregnancy, from pressure of the enlarged uterus on the sac, but during the labour it is especially dangerous as the sac is exposed to severe pressure, inflammation may be set up causing death of the patient.

Prognosis of combined intra- & extra-uterine pregnancy is not much more grave, the intra-uterine child may be expelled & if there is no damage done to the cyst, the patient may survive many years as in a pure case of extra-uterine gestation.

Treatment.

May be divided into 4 stages (1) before rupture (2) during the time of rupture (3) during the remainder of the usual term of gestation. (4) After that period or after death of the foetus.

I. Before Rupture. We have two lines of treatment here. (1) If we were perfectly certain of our diagnosis, the removal of the cyst by abdominal section would be best. If the case is left to nature, rupture is almost certain to occur before the 4th month & generally leads to the death of the mother. If the cyst was situated at the ovarian end of the tube or in the ovary, it could be easily ligatured. When in the centre of the tube it would be more difficult, but by transfixing the broad ligament below the cyst with a double ligature & carrying one ligature up round the tissues to the inner side of the cyst & the other ligature round the tissues to the outer side, a V shaped portion of the broad ligament is removed including the cyst. If it was impossible to remove the sac alone, the body of the uterus & appendages could be taken away with it, would leave a better chance of the patients recovery than she would have after rupture of the cyst.

Thomas was successful in operating through the vagina - he says "if the tumour be low in the pelvis, fluctuation in it beyond doubt reaching the sac certain, the safest & best method of dealing with the case would be to introduce a large Sims speculum & cut through the sac with a Paquelin's cautery at a red heat. The foetus is then removed, but not the placenta & a linen bag filled with cotton is used as a compress fixed externally upon the abdomen over the site of the tumour, with adhesive plaster. The sac should be carefully filled with antiseptic cotton renewed once every 36 hours. By these means haemorrhage can be completely controlled."

(2) The second method of treatment is to endeavour to arrest the life of the foetus so as to check its further growth in the hope it may become absorbed or remain inert & passive in its sac & thus avoid rupture. Various methods have been tried for this:-

(a) Tapping the cyst with a fine trocar through the rectum or vagina, so as to draw off the liquor amnii; as a result of this the cyst collapses & the embryo dies & atrophy of the cyst ensues. A successful case is reported by Greenhalgh in the Lancet 1867. In other cases sudden collapse &

rupture of the sac & death from haemorrhage have followed. Thomas punctured two cases & they died, one of septicaemia, the other of haemorrhage into the sac & rupture. Parry objects to this mode of treatment, he says the death of the foetus is not insured by the discharge of the liquor amnii & that the practice is not without danger to the mother as it may lead to decomposition of the cyst-contents, septicaemia & death. He would in preference use electricity or section of the vagina by the thermo-cautery. Playfair, Barnes, Thorburn & others are of opinion that tapping with a fine trocar rendered perfectly aseptic is the simplest & most effectual plan for arresting foetal life. They think it probable that puncture of the cyst which forms a part of the other methods of operating, is by itself adequate to account for the successful result.

Tapping seems advisable from the very structure of the envelopes of an extra-uterine gestation viz the contractile tissue in the tube which gives the power of contraction to the sac, so that when the cyst is punctured & liquor amnii escaped it would thus leave the sac to contract on the foetus & so lead to its death & consequent absorption.

(6) Injecting through vaginal or abdominal walls by

means of a long slender needle, a solution of morphia (¼-½ gr) into the cyst or better into the body of the foetus. This is considered by many as the best means at our disposal. (c) Destroying the foetus by electricity. Needles may be inserted into the sac & a continuous or interrupted current passed. Lusk relates several successful cases following the use of the Faradaic current - one electrode passed through the rectum to the tumour & the other on a point in the abdominal wall, 2-3 inches above Poupart's ligament. The current should be passed daily for 5 or 10 minutes & continued for a week or two until the shrinking of the tumour gives evidence of the death of the foetus. Allen of Philadelphia was successful in two cases. He used an ordinary electro-magnetic machine, one pole applied to the tumour in the vagina through a glass speculum, the other to the surface of the abdomen over the foetal cyst. Successful cases are also reported by Aveling and Petch in the Brit. Med. Journ. 1886; and Breything in the New York Med. Journ. 1886. Aveling used the interrupted current 4 times. Petch inserted two needles insulated up to ¾ inch from the point, they were connected with a Leclanché Battery & the current of 30 cells allowed to pass for one hour. (d) Other means of destroying the foetus have been

proposed, such as compression of the tumour, or administration of toxic remedies to the mother as Iodine, Strychnia, Mercury, but without success.

One objection however exists to all these methods viz that after the foetus has been destroyed death of the placenta may not follow & its vegetations may go on sprouting beyond even the normal extent, thus greatly complicating any future proceedings. This growth of placenta was seen in Barbours case (Edin. Obs. Trans. 1882); & in Thorntons case (Lond. Obs. Trans. 1882) where the foetus died at the 4th month & the placenta continued to grow & formed a solid mass simulating a fibroid.

Again supposing we are successful in our treatment at the time, there is always the danger of suppuration occurring at a later period in the sac which may set up peritonitis or septicaemia & cause death of the patient. If the case can be diagnosed with certainty, the greatest safety would lie with the removal of the foetus & its sac if possible by abdominal incision, & the earlier the better.

II Time of Rupture. When this has occurred, the treatment hitherto has been the same as that for Haematocele — keeping the patient at rest, stimulating freely, applying ice to the abdomen for the

bleeding & giving morphia to relieve the pain, but the majority now suggest that it is perfectly justifiable to perform laparotomy, sponge away the effused blood & place a ligature round the lacerated tube on its uterine side & remove it with its contents & further haemorrhage is thus avoided. Until the operation is decided on, pressure on the abdominal aorta may assist in checking further haemorrhage.

Barnes says this operation does not materially add to the shock already dealt by the rupture & it gives the best chance of recovery in severe cases, "it should be done early". Freund on the other hand says (Edin. Obs. Trans 1882-83) death from rupture is not so common as supposed & if we operate at this time we often fail to discover or control the source of the haemorrhage; for these reasons laparotomy is contra-indicated & we should simply treat the threatening symptoms of anaemia & peritonitis.

Lately several cases have been successfully operated on at the period of rupture, which seems to show that abdominal section is the proper treatment when this has occurred. Tait has operated on 21 cases & only one died (Brit. Med. Jour 1884-85 & 86): Johnstone one case (Med. Rec. 1886): Hart one case (Brit. Med. Jour. 1886). In the last mentioned case a large

quantity of tarry looking blood welled up when the abdomen was opened; it had evidently been effused for sometime. A foetus of 6 weeks was found among the coils of intestine; the left tube enlarged & the rupture about as large as the tip of the index finger. Water of the temperature of 100°-120° F was used with success to douche out the pelvis to arrest any oozing from the peritoneum.

If the patient have survived rupture & the period of shock has passed, the effused blood becomes slowly absorbed. She is to be kept at rest, pain relieved by morphia hypodermically or in suppositories, hot fomentations, poultices (with mustard if there is vomiting) Stimulants are usually necessary. If the blood in the Pouch of Douglas is fluid it may be drawn off with an aspirator. If instead of absorption we should get suppuration of the effused blood, the abscess may be opened through the vaginal roof by Paquelins Cautery & a drainage tube inserted & the cavity washed out daily with carbolic acid solution (1-100).

Quinine & Iron should be given internally.

Even in this case however it might be a wiser course to open the abdomen & remove by the offending structures.

III. During the remainder of the usual course of gestation.
There is not the same risk of rupture of the cyst now as in fatal gestation & it is generally admitted that it is not advisable to adopt any active measures until full term of development is reached. Two views are advanced here - the one is to perform laparotomy before the foetus perishes & if possible save a living child from a living mother; the other is to delay operating until death of the foetus & urgent symptoms have arisen.
Tait, Barnes, Thomas, Hicks & others advocate primary laparotomy. The arguments in its favour are - It affords a chance of saving the child & the risks are not greater to the mother than may be anticipated by delay. If we delay, the cyst may rupture during the false labour & cause death of the mother, or death may result from peritonitis or exhaustion consequent on the efforts at elimination.
Parry and Hutchinson are in favour of secondary laparotomy, which consists in operating after the death of the foetus & when urgent symptoms have arisen. If we delay, the inflammation about the cyst will have led to the formation of adhesions between the sac & abdominal walls so as to shut its contents off from the peritoneal cavity and

the more thoroughly this is accomplished the greater are the chances of recovery. By delay there is also less risk of Haemorrhage, as the placental circulation will have ceased & the placenta atrophied, from the foetus having been dead sometime, also the vascularity of the cyst will have diminished. Parry says the primary operation cannot be too emphatically condemned, notwithstanding the possibility of saving the child & even of saving both mother & child. The mortality he says is 14.35% less in secondary than in primary gastrotomy. Hutchinson's opinion is (Lancet 1873) that after waiting till the death of the foetus two urgent symptoms have arisen "extra-uterine cysts ought not to be meddled with in any way either by puncture or incision until suppuration has occurred & an abscess fistula has been formed."
Prof. Wirth is also in favour of delay. (Brit. Med. Jour. 1884)

Jessop (Lond. Obs. Trans. 1876) successfully performed primary laparotomy & saved both mother & child, this was the first case in this country. His reasons for operating were - "the dangerous state the mother was in & that she probably had not many hours to live. Her only chance lay in the removal of the child & as to the child itself there was no apparent reason why its life might not be preserved". He continues to say -

the operation itself presented few difficulties or complications, the peritoneum was fairly healthy & contained nothing more than a few albuminous shreds & a small quantity of clear liquid. There were no membranes no adhesions, no enclosing capsule for the child, no bleeding to stop & the abdominal organs were but little disturbed. He did not interfere with the placenta & provision was made for its escape from the abdomen after separation, by carrying the cord through the lower part of the wound & leaving it there. The discharge from the wound was profuse & offensive. She was seized several times a day with agonising pain in the abdomen which was at once relieved by the outpouring from the wound of a quantity of putrescent coffee coloured fluid the consistence of treacle. The discharge ceased & the wound healed up within 2½ months. Probably if a drainage tube had been introduced alongside the cord & the cavity washed out daily with an antiseptic solution she might have been saved the attacks of pain which accompanied the expulsion of the accumulated fluid.

Laparotomy. In performing the primary operation we should wait till term when false labour usually sets in, & having proved by auscultation the foetus is alive, proceed to operate. The bowels

and bladder should be emptied & the position of the bladder noted for fear it is adherent to the abdominal wall. If possible we should also try & make out the position of the placenta, as it has been found attached to the anterior abdominal wall in the line of the incision & led to the Operation being abandoned on account of the severe haemorrhage that followed incision of it. The Operation should be done with strict antiseptic precautions, the hands of the operator & the abdomen of the patient should be washed with turpentine soap water & then carbolic acid or corrosive sublimate solution. Sponges & artery forceps &c are to be counted & a note kept of them so that none may be left in the abdominal cavity. As a precaution before making the incision, the uterine cavity should be carefully examined with the sound or finger to make perfectly sure it is empty & the child is extra-uterine. The incision is made in the middle line & long enough to ensure facility in extracting the child, it may be lengthened if occasion requires. If the Cyst is connected by adhesions to the abdominal wall, a small opening should first be made in it, the finger introduced, & the extent of attachment of the Cyst to the abdominal wall made out; then the incision is enlarged

care being taken not to extend it beyond the connections of the cyst & abdominal walls. If there are no adhesions the walls of the cyst should be stitched to the margins of the incision so as to shut it off as completely as possible from the peritoneal cavity. Thus the entrance of septic matter either at the time of operation or subsequently into the peritoneal cavity is avoided. An incision is now made in the sac but before doing so the fluid content might be drawn off by an aspirator & thus further diminish the risk. The foetus is best extracted from the sac by grasping it by the legs or breech & then making traction. Sometimes in secondary Laparotomy if the foetus has been retained for any length of time, adhesions may have formed between it & the sac; Freund relates a case (Edin. Obs. Trans 1882-83) where the foetus lay transversely & was adherent with the whole right side of its body from head to foot, to the upper wall of the gestation sac. When this has occurred we find on making traction we cannot remove the foetus, these adhesions should then be searched for, a double ligature put on & then divided with scissors between the two ligatures. The cord is now ligatured & divided & the cavity of the cyst sponged out. No attempt is to be made to remove the placenta in either Primary or Secondary

Laparotomy. Its attachments are generally so deeply seated & diffused that any attempt to separate it is likely to be attended with profuse & uncontrollable haemorrhage or serious injury to the structures to which it is attached. In a case of Freund's, 16 days after laparotomy had been performed he attempted to detach a piece of placenta but bleeding at once occurred; 8 days later it came away itself. The sac should now be douched out with warm carbolic acid solution & afterwards it may be sprinkled with equal parts of Iodoform & Bismuth or equal parts of tannin and salicylic acid (Freund). The cord is brought out through the lower part of the wound & a large sized drainage tube introduced, the upper part of the wound being stitched up with deep (silk) & superficial (horsehair) stitches, it is then sprinkled with Iodoform & Bismuth & dressed with Iodoform gauze. The subsequent treatment is to be directed to favour the escape of the discharge & to prevent risk of septicaemia. The cyst should be douched out daily with warm carbolic lotion, the lotion & discharge being removed from the cavity by pumping with a syringe, but this is much better accomplished by reversing the action of the douche tube & converting it into a syphon so that all the fluid runs out. As long as the placenta

remains the danger to the patient is great, it may come away in a few days or it may not be for weeks. When this has taken place the sac contracts and gradually becomes completely closed. Hart (Edin. Med. Jour. 1884) says in operating for advanced gestation, the foetus only should be removed, the cord tied & returned and the wound closed unless a septic condition requires drainage. A case is recorded by Braithwaite (Lond. Obs. Trans. 1886) where the placenta never came away except a morsel 20 grains in weight which protruded at the upper angle of the wound on the 6th day. It must have been slowly absorbed.

When the placenta is so situated that it has to be cut through in the operation viz the anterior abdominal wall. the bleeding may be best controlled by cold sponges introduced through the wound & held against the cut margins of the placenta with external counter-pressure, if that fail we may have to apply perchloride of iron & even the actual cautery. Hennann (Lond. Obs. Trans. 1886) had a case of this kind but he proceeded to separate the placenta by tearing it from the abdominal wall & bladder; a ligature was passed through the left broad ligament & the placenta then cut away.

IV. After death of the foetus. When the foetus is dead we should wait. If urgent symptoms arise as those of septicaemia, peritonitis, exhaustion, then perform secondary gastrotomy. The operation is done in the same way as the primary one, only we are more liable to meet with adhesions between the sac & the abdominal wall & in some cases between the foetus & the sac. The greater the adhesions the safer the operation as the peritoneal cavity is thus shut off from the cyst & septic matters cannot get in. Diagnosis of adhesions before operation is difficult but if we find the abdominal walls do not move freely over the cyst & if the umbilicus be depressed & immovable, the probabilities are that considerable adhesion exists. Hicks says (Lond. Obs. Trans. 1868) that we can make tolerably sure of securing an adherent surface by strict attention to the spot of greatest tenderness on pressure.

Macdonald reports a case (Edin. Obs. Trans. 1883) where he found part of the sac formed by 5 to 6 inches of small intestine, the walls of which were thickened, softened & almost gangrenous. This piece of the intestine was cut out & the healthy ends of the bowel brought together by a continuous catgut suture, similarly the gap in the mesentery which was brought together. A fistula through faecal matter escaped into the sac was also found & the edges

were pared & stitched: patient recovered.

When no urgent symptoms arise then leave the case to nature until she indicates the channel by which elimination is to be effected. If the sac opens through the abdominal wall, the opening should be enlarged & the foetus or the parts of it that remain, extracted. If it opens into the vagina the orifice should be enlarged & the foetus removed. If it opens into the bladder, lithotomy should be performed, opening into the bladder through the vagina or supra pubically, the latter if the bladder is adherent to the abdominal wall. In some cases it may be possible to remove the bones through the dilated urethra without resorting to lithotomy, in this case the large bones, especially flat ones, would require to be divided in the bladder before they could be extracted. If it opens by the rectum any bones & pieces of the child within reach should be removed with the fingers or forceps. The patient should be anaesthetized & the hand passed into the bowel to feel for the opening into the cyst & through this the foetus may be removed if it (the opening) is large enough. We thus diminish pain & the dangers of septicaemia. If the orifice is too small for this & especially if urgent symptoms arise, laparotomy should be performed & the child removed.

If the child is retained in the abdomen for a long time & the patient become pregnant again the labour may terminate normally & often does, or it may be necessary to elevate the tumour, use forceps, turn the child, or perform craniotomy or Caesarean section.

Opening the Cyst by Caustics. eg. potassa fusa has been recommended in the hope it would set up adhesive inflammation around the aperture thus formed Several successful cases are recorded. It has generally been applied to the middle line and after two or more applications the cyst is to be opened with a knife & the child extracted. It should be limited to those cases in which adhesions are absent, this being suspected by the extreme mobility of the cyst. It is now superceded by laparotomy as the process is tedious & would cause prolonged suffering besides the dangers of septicaemia from the slouching surface.

Delivery by the Vagina. This has been done in several cases by incision through the roof of the vagina into the Pouch of Douglas. Parry collected 15 cases, of these 9 died and 6 lived, a mortality of 60%, only two children were saved. If this operation is done it should be confined to cases where the head or breech presents in the pelvis & where adhesions are supposed to be absent. The vagina should be incised over the most prominent

part & the child extracted as in ordinary deliveries. Forceps are usually necessary. The placenta should be left in situ & the wound kept open to allow it to come away after it separates. The chances of recovery are not so great as after laparotomy. Tait says in the Med. Times & Gazette 1873 that "it should always give place to abdominal section as being more scientific & less risky."

One of the first to perform this operation was Dr. King of Edisto Island (1816) who incised the vagina at term & saved both mother & child. Mathieson (Lond. Obs. Trans. 1884) reports a case — on vaginal examination the roof of the vagina was filled with a semi-elastic almost-doughy mass, solid on deeper pressure & by external pressure it could be brought within easy reach of the finger. An incision was made in the most dependent part of the roof of the vagina & the first came on blood clots, then the membranes of the foetus which were torn & the face felt to present. Forceps were applied & she delivered a living child with moderate traction. The hand was then introduced & the placenta felt at the posterior & left side of the cavity. There was no haemorrhage but he proceeded to separate the placenta with his finger assisted by external pressure through the abdominal wall. The bleeding was arrested by a sponge saturated in perchloride of iron; as a

piece of the placenta was detached the sponge was pressed into the bleeding surface & then another piece was detached & so on. The patient recovered. She gives no reason for detaching the placenta, the rule is to leave it. Parry says this is more necessary after vaginal section than laparotomy, as its removal may cause laceration of the cyst wall.

Combined Intra- and Extra-uterine Pregnancy. at term.

As a rule labour progresses normally in these cases until the intra-uterine child is born. In some cases it may be necessary under chloroform to push aside the extra-uterine tumour if it present at the brim & turn the uterine child & deliver; or perforation or Caesarean section may be required. After the uterine child is born, primary laparotomy has been recommended for extraction of the extra-uterine foetus. Parry says this should be emphatically condemned as the risks of this operation during the puerperal condition have been shown to be so great, that counting the child's life as equal to the mothers, more human lives will be spared by expectancy than by active interference.

In Interstitial Pregnancy the uterine cavity should be dilated so that palpation from within could be practised & the possibility of incision considered.

Hodge of Philadelphia in 1867 diagnosed Interstitial

Pregnancy, cut through the layer of tissue which separated the uterus from the sac & delivered the woman safely.

General Treatment of Extra-uterine Gestation.

little requires to be said about this. Pain should be relieved by opiates hypodermically, by the stomach or suppository. The strength should be kept up by light nourishing diet & if necessary stimulants. If suppuration in the cyst occur she should have plenty of easily digested nourishing food as strong beef tea, Brands Essence of beef, milk, eggs & brandy &c. & of drugs Quinine & Iron are the best. Careful regulation of the bowels & making milk the chief article of diet is insisted on by Freund (Edin. obs. Trans 1882-83) as important in the management of cases before operation. He says "whether the gestation be in a previously formed shut sac or free in the abdomen (with or without the placenta being attached to the bowels) a loaded bowel always acts unfavourably on the gestation sac. Adhesions easily form through which the child may possibly become infected. This is more important in abdominal gestation if there is reason to suppose the placenta is implanted on the bowels."