Case of Fallopian Pregnancy resulting in Rupture of the Cyst and terminating in Death. Reported by ROBERT P. HARRIS, M. D., Philadelphia. [Read before the Philadelphia Pathological Society Nov. 25th, 1857.]

MRS. S., the subject of the following report and observations, a lady of medium height, somewhat full habit, 27 years of age, and the mother of an infant a year old, ate her breakfast on the morning of the 24th of October, 1857, apparently in perfect health, and between nine and ten o'clock was suddenly seized with excruciating pain in the lower part of the abdomen, followed almost immediately by a feeling of faintness. Her pulse became very rapid and feeble, extremities cold, and surface of the body very pale, as though exhaustion was being produced by internal hemorrhage. Stimulants, such as wine whey, brandy and water, milk punch, and carbonate of ammonia were freely administered, and cataplasms of mustard and ginger, together with frictions of Cayenne pepper and whiskey applied externally, but to no purpose. The pain, which was at first very severe, soon diminished, and finally ceased; she gradually became more and more feeble, no pulsation of the arteries at the wrist was perceptible, and the whole surface of the body became cold, so that in a few hours from the commencement of the attack all hope of recovery was abandoned. She remained in a moribund condition, with little apparent change, until, from a gradual loss of vital power, she ceased to breathe about seven o'clock on the following morning, twenty-one hours after the commencement of the attack.

The next great point of interest in the case was to find out the cause of death, for although a correct diagnosis was not impossible, yet its uncertainty demanded that, for the benefit of science, it should be verified by the only sure test in such cases, *i. e.* a post-mortem examination of the body. By a refusal to grant a certificate of death to the relatives of the deceased because of incompetency to state positively the cause of death, permission, after some hesitation, was obtained to make an autopsy, and twenty-nine hours after death we entered upon the examination. Upon uncovering the body, the abdomen was found much distended and tympanitic over its whole extent, and, incising the skin and soft parts down to the linea alba, a thickness of adipose deposit, varying from an inch to an inch and a half, proved the full state of health of the patient at the onset of her disease. Further dissection showed that the intestines, both large and small, were very much inflated, and that the omentum was wrinkled and drawn up to the right upper portion of the umbilical region. Extending the vertical incision down to the pubis, we were arrested in our examination by the escape of a small quantity of serous

fluid, and upon drawing the intestines upward from the brim of the pelvis, we found that the cavity of the pelvis, as well as the lower and back part of the abdominal cavity, was filled with black blood in a partly fluid, partly coagulated state. After this was removed by means of a sponge, to the amount of perhaps half a gallon, a small abnormal growth in the course of the right Fallopian tube arrested our attention, and caused us to dissect out and carefully remove the uterus with its appendages.

The uterus proved to be scarcely if at all enlarged beyond the size we usually find it in healthy women who have borne children. Its cavity contained a little mucus slightly tinged with blood, but no trace of a membrana decidua; the ovaries were healthy, of normal size, but very pale in colour, from their anæmic state, and the left Fallopian tube presented nothing unusual; but in the right one, immediately above the ovary, was a tumour of an oval form, slightly flattened antero-posteriorly, about an inch and a quarter long, an inch in its vertical diameter, and of a reddish-blue colour. Upon close examination, a small opening of a little more than a line in diameter was detected at its upper surface, perforating the edge of the broad ligament. This hole communicated with the peripheral portion of the body, but not with its interior cavity. An incision made through the cortical portion so as to divide the body to its centre, revealed a cavity containing a small diaphanous sac, within which was a human embryo of a pure white colour, and half an inch in length, looking a good deal like a common maggot.

Here, then, was clearly revealed the cause of death, and the supposition with regard to the nature of the disease proved to be correct. An ovum had become arrested in the Fallopian tube in its progress from the ovary to the uterus, had become partly developed in its abnormal situation, and when it had attained the age of three or four weeks had bursted, thereby making a direct communication between its bloodvessels and the cavity of the abdomen, and the patient had died of internal hemorrhage. This Fallopian or tubal cyst and the diameter of the perforation had in all probability been larger at the time that rupture took place than they were found to be when the autopsy was made, as they would both naturally diminish somewhat after the force of the discharging current of blood began to decrease. This would account for the sudden prostration that took place at the commencement of the hemorrhage, as well as for the length of time that the patient lived after she appeared to be in a dying condition. The accident was no doubt in a great measure determined at the time it did take place, by the condition of the patient, who was menstruating. The increased flow of blood to the uterine organs probably contributed to produce the rupture of the cyst, which appeared to have given way very much after the manner of an aneurismal sac. The chief peculiarity of the case was the very early age in the development of the ovum at which the rupture took place, a shorter time after conception than any of the cases of similar accident that I have met with in works upon extra-uterine pregnancy, or in the medical journals.

Remarks.—In view of the importance of this interesting case, it will be perhaps profitable to examine more particularly into the nature of Fallopian pregnancies, the most common to be met with of all the forms of extra-uterine fœtation. Embryologists whose researches have been most recently brought before the eye of the profession divide the forms of extra-uterine pregnancy into ten separate and distinct varieties, of which six are more or less connected with the Fallopian tube. These have been denominated sim

ple Fallopian or tubal; tubo-ovarian; tubo-abdominal; utero-tubal; tubo-uterine-interstitial, and utero-tubo-abdominal—names which in a very simple manner convey to the mind a knowledge of the situations occupied by the ovum.

Causes of Fallopian Pregnancy.—When we look into the nature of conception, and the structure and uses of the Fallopian tube, we are not surprised that cases of tubal pregnancy are met with, but are amazed that they do not more frequently present themselves to our observation. M. Coste, of Paris, who has for the last twenty-six years been investigating the nature of conception and fœtal development under the most favourable circumstances; M. Velpeau, and other celebrated embryologists, have not yet been able positively to determine the manner in which the ovule is carried from the ovary through the oviduct to the uterus. The spermatic fluid of the male, it is now generally believed, passes along the Fallopian tube to the ovary and there fecundates the matured Graafian vesicle, which, bursting through the parenchyma of the ovarium, is grasped by the funnel-shaped extremity of the tube, to be carried into the uterus for its future development; but how it is so propelled, whether by a movement of the epithelial ciliæ of the mucous membrane lining the oviduct, by a consecutive annular dilatation and contraction of the walls of the tube, or by a combination of both species of movement, it is impossible fully to determine, though from the fact of the existence of longitudinal and circular muscular fibres in the walls of the tube it is most probable that progressive motion is given by them to the ovule, somewhat after the manner in which deglutition is effected in the œsophagus of a serpent. The canal is much too small in its natural condition to admit of the passage of the ovule without considerable dilatation, and, judging from the analogy which exists between the structure of the Fallopian tube and other tubular organs of our bodies whose propulsive power is much more readily and certainly determined, we have great reason for supposing that it is by a species of vermicular or peristaltic action that the Fallopian tube is enabled to perform one of its most important functions. It may be very readily conceived that the physiological action of the tube might by some disturbing cause of so slight a nature as not to be appreciable, be so deranged that an arrest in the progress of the fecundated ovule towards the cavity of the womb should take place, and the ovule be developed at the point where it ceased to advance. In some of the cases that have been reported by medical observers, injuries and severe mental disturbances were assigned as causes for this cessation of the conducting action of the tube; but in by far the greater number of those which have been published no definite reason could be given why the ovule should not have continued in its onward movement until it reached the uterine cavity. In many of the autopsies that have taken place in cases where death has resulted from the bursting of a tubal fecundated cyst, the ovum had not advanced beyond the enlarged extremity or infundibulum of the oviduct, constituting the tubo-ovarian variety of extra-uterine pregnancy, in which situation the ovule is

probably arrested, from its being too largely developed previous to its passage into the funnel-shaped portion of the tube, to admit of its being carried through the more contracted section beyond.

It is to be presumed that as there is no vascular sustenance afforded to the ovule until adhesion takes place between it and some contiguous tissue, that it does not increase in size in its passage from the ovarium to the uterus when no impediment to its course exists; which will account in a great measure for the infrequency of tubal pregnancies as compared with uterine. Simple tubal pregnancy is more common than any of the other six varieties, from the fact that as there is a long and narrow canal to be passed through, the ovule is here most likely to meet with impediments to its progress, or to form adhesions with the surrounding tissues; and cases are on record of the development of ova at almost any point between the infundibular portion and the uterine extremity of the tube, even in that portion of the canal which lies between the external and internal surfaces of the womb itself, where the passage is larger than the central section of the conduit.

Diagnosis.—The difficulty of determining the presence of abnormal growths connected with the uterine appendages is well known to be very great; still more does it approach to an impossibility to define their nature when the fact of their existence is beyond dispute; and this is particularly the case in the early stage of their development, whilst they are but yet small. Some of the varieties of extra-uterine pregnancy can be distinguished with sufficient certainty in the latter months of gestation to warrant a resort to an operation for the purpose of removing the fœtus and thus favouring the cure of the patient. This is particularly the case with that form denominated sub-peritoneo-pelvic, where the ovum is developed between the peritoneal laminæ of the broad ligament, and which, as it increases in size, presents one extremity (generally that containing the head of the fœtus) low down in the pelvis alongside of the vagina, where it may be felt and recognized: but in most tubal pregnancies the position of the sac not only renders it very difficult of recognition by palpation, percussion, or an examination per vaginam or rectum, but makes it almost impossible by such means to define positively to which of the varieties the disease properly belongs. When the fœtus is sufficiently developed to afford recognizable cardiac sounds, the chances for making a diagnosis as to the true nature of the disease are much increased; but we must not forget that here a mistake may be, as it has been made, for cases are upon record where intra-uterine fœtation was mistaken for preternatural, and the sound of the arterial thrill in the aorta for that of the heart of a fœtus.

In those cases where a physician is called in to give his opinion as to the nature of the complaint, gestation is almost always advanced beyond the period when the patient this article refers to died, for in the first two or three months, as a general rule, the attention of the female is not directed to her condition by any symptoms sufficiently alarming to cause her to seek advice,

and she attributes her feelings to a natural condition consequent upon conception. If menstruation continues, which it does not do in the generality of cases, it will sometimes cause an earlier attention than otherwise; but not always so, as in many cases of normal gestation it is well known that women continue to be regular for a few months after conception has taken place. Ovarian pregnancy is much more apt to attract early attention than Fallopian, in consequence of the greater sensitiveness of the organ involved. Generally the first symptoms of an alarming kind which are felt are certain anomalous pains and spasms of the abdomen, accompanied by fainting turns and alarming prostration. In tubal and ovarian pregnancies these pains are seated low down in the abdominal cavity, but in abdominal fœtation they are not much confined to one situation, but extend more or less over the whole abdomen, which is very tender to the pressure of the hand. These symptoms may be the immediate precursor of rupture of the sac, or they may disappear and return from time to time until either the fœtus dies, the sac bursts, or some other of the changes to be hereafter mentioned take place in the sac or its contents.

If the pains experienced are those of actual labour and the period of gestation be far advanced, there will be but little difficulty in telling whether the fœtus is within or without the uterus. The abdomen will in the latter event be found of an irregular conformation and the fœtus more to one side than ordinary. If the bladder be emptied by a catheter it will not be very difficult to feel the fundus of the womb just above the symphysis pubis, as in cases of normal parturition after the expulsion of the fœtus, and when the membrana decidua (if there be one) is expelled, to establish the non-existence of a fœtus in the uterine cavity by the introduction of the index finger.

The frequency of the existence of tubal pregnancy as compared with the other forms of extra-uterine fœtation, makes it probable, when we meet with a case of preternatural gestation, that it belongs to the former class. The collection of cases made by M. Daynac, of Paris, and published in 1825, shows that in one hundred and fifty cases of extra-uterine pregnancy, about ninety, or three-fifths, belong to one or other of the tubal varieties; thirty, or one-fifth, to the ovarian, and the remainder to the abdominal, &c. Some writers have stated the proportion of Fallopian pregnancies to be still greater, as M. Czihak, who says that they are as three to one. In many cases of simple Fallopian pregnancy during the early months of gestation, the uterus is little if at all augmented in size; but in some, as the utero-tubal and utero-tubo-abdominal varieties, where the womb makes a portion of the gestative sac, it becomes considerably enlarged, thus deceiving the physician as to the nature of the pregnancy when examined by the touch. In the latter months of gestation the uterus is enlarged in all the varieties of extra-uterine pregnancy, though much more in those immediately connected with it than those entirely separated from it. In order fully to comprehend the difficulties which stand in the way of making an accurate and reliable diagnosis in extra-uterine

pregnancies it is only necessary to refer to the reports of cases to be met with in medical books and periodicals and see the mistakes that have been made by men of undoubted skill. When a small ovum has bursted there is often less difficulty in determining the nature of the lesion than there is when the sac is whole, and of much larger size than the cyst found in the case of Mrs. S.; for although in the former case auscultation, palpation, and the touch are capable of revealing nothing, yet the alarming symptoms present indicate with some degree of probability the nature of the malady.

In determining the nature of the disease which had caused the death of the patient whose case has been recorded in these lines, I reasoned, before commencing the examination of the body, in this way: Here is a lady of full habit whose health has for some months been excellent, and the age of whose infant makes it highly probable that she may have conceived. The symptoms of her malady evidently denote that she died from the effects of internal hemorrhage, and the manner of the commencement of the attack, that the blood escaped into the cavity of the abdomen. Now where did this blood come from? The patient, before her last accouchement and for some time subsequently was troubled with diarrhœa: might she not have had perforation of the intestines? The physical condition of the woman, and her excellent health for some months past show almost to a certainty that no ulceration sufficient to have produced such an event could have existed in the alimentary canal. Was she pregnant? She thought not, because she was menstruating when the attack came on: but this does not prove the non-existence of extra-uterine pregnancy, as many cases which have been recorded show that the menstrual function is frequently not affected by preternatural pregnancies. The os uteri when examined by the touch soon after the commencement of the attack, appeared to be very sensitive, which is often the case in disease of the uterine appendages, but it is no positive indication of the existence of any lesion, because menstruation of itself sometimes increases the nervous sensibility of the uterus. The nature of the pain experienced, its seat at the lower part of the abdomen, and the evidence of a sudden and continued discharge of blood, commencing directly after the pain was first felt, so exactly corresponded with the history of many recorded cases of rupture of extra-uterine cysts that I was led to believe that a post-mortem examination would prove that I was correct in pronouncing the cause of death to have been the "rupture of an extra-uterine fecundated cyst." Having determined in my mind the nature of the disease, it was of little practical moment where the cyst was situated in a case of this character; from the frequency of Fallopian pregnancies over the other varieties of preternatural fœtation, it would have been natural to have supposed that the seat of the cyst would be found to be some portion of the oviduct.

Prognosis.—From the nature of Fallopian pregnancies it will readily be conceived that the prognosis is exceedingly unfavourable, an opinion which will be fully confirmed by a reference to reports of published cases to be found

in the collections of Dezeimeris, Petsch, Moreau, Daynac and others. Although Fallopian gestation is not in all its varieties necessarily fatal, yet the great majority of cases ultimately sooner or later perish, and most of these from internal hemorrhage. The length of time that elapses between conception and a fatal termination varies very much in different subjects, being determined in some cases by accidental causes, as blows, falls, &c., and in others by distension and thinning of the walls of the sac; by mechanical pressure; uterine gestation; hyperæmia of the uterine vessels; conversion of the cyst into a dropsical sac; suppuration, &c. Most of the cases of rupture terminate before the fifth month, but some do not until the full period of gestation is completed. The bursting of the tube is not in all cases followed immediately by death, for in some the ovule escapes entire, falls into the abdominal cavity, and there forms adhesions, becoming further developed as an abdominal pregnancy; in others the placenta remains attached within the tube, and the membranous bag containing the fœtus escapes to become thereafter developed exterior to the tube in the abdominal cavity, constituting a tubo-abdominal pregnancy. In the first case a cure may possibly take place by ulceration, so as to discharge the fœtus into the rectum or vagina, or be effected artificially by the vaginal section; in the latter, gastrotomy might possibly be performed with benefit, but I am not aware of its ever having yet been attended with other than fatal results so far as the effect upon the mother is concerned, owing to the difficulty of removing the placenta without fatal consequences, the impossibility of letting it remain and still saving the patient, and the danger of peritonitis. A very interesting example of abdominal pregnancy in which gastrotomy was performed may be found recorded in the *Philadelphia Journal of the Medical and Physical Sciences*, vol. i., New Series, 1825, p. 129. The patient died of peritonitis upon the fifth day after the operation.

Of the six varieties of extra-uterine fœtation in which the Fallopian tube forms the whole or contributes to form a part of the gestating sac, the utero-tubal is the most favourable. In this form it is quite possible that the efforts of nature alone, or if not, with the assistance of the hand of an accoucheur, may suffice to deliver the woman through the natural outlet, for a proof of which I refer you to the case reported by Richter and reprinted in Moreau's work upon extra-uterine pregnancies,[1] and to that reported by M. de Ritzen, reprinted in the *Medical Examiner* (Philadelphia) of 1841, p. 638. The favourable results of these two cases must not always or even generally be expected in utero-tubal pregnancies, for it is this variety which by consecutive action forms the utero-tubo-abdominal, perhaps of all the forms the most certain to result in the death of the patient. In the work of Moreau above referred to (pp. 29 to 36), may be found three very interesting reports of cases of this latter complicated preternatural pregnancy, which were observed and described by Patuna, William Hey, and Hoffmeister, the last of whom

[1] Des Grossesses Extra-Uterine, par M. Alexis Moreau, p. 27. Paris, 1858.

performed the operation of gastrotomy upon his patient immediately after her death, in the hope of saving the life of the fœtus, but without effect.

It is not necessary to the favourable termination of all cases of Fallopian pregnancy that the contents of the gestating sac should be removed from the body either by the efforts of nature or by a surgical operation, for there is quite a number of cases on record whose recovery took place with the fœtus remaining *in situ*. Owing to some cause or other not to be readily accounted for, the fœtus sometimes ceases to grow, and loses its independent life without being, properly speaking, dead, as it still remains an organized body, capable of undergoing many of the changes to which such bodies are subject. From published researches we learn that the following remarkable changes have been observed to take place in the sac and its contents: Most commonly the cyst has been found contracted, the liquor amnii in whole or a great measure absorbed, and the fœtus shrivelled, as though it had undergone a species of mummification. In other cases the sac has been found changed to a cartilaginous substance, or converted partially or entirely into bone; and the fœtus into bone wholly or partially, or changed into a cretaceous substance, or into a mass resembling adipocire. In Cloquet's *Pathological Anatomy* may be seen a fine view and section of a cretaceous or petrified fœtus. This transformation is rare in tubal pregnancies, nevertheless it does occur; in proof of which see the report of a case by Fritze, of Strasbourg, in 1779, and referred to in the works of Moreau and others. In abdominal pregnancies it is of more frequent occurrence. After the transformations mentioned fœtuses have been carried in the abdomen with little or no inconvenience for a number of years, reaching as high as fifty-four in one case on record. M. Majon discovered an ossified fœtus in a female who had died at the age of 78 years, and MM. Varnier and Mangin found two in a woman of 74, one of which was ossified and the other entirely decomposed, with the exception of the bones.

Treatment.—Fallopian pregnancy as well as the other forms of extra-uterine fœtation are to be regarded more in the light of curiosities than of diseases which are amenable to treatment, though under certain circumstances much may be done, either for the purpose of alleviating suffering or with a view of restoring the patient to health. What is most to be desired in the early months of gestation is the death of the fœtus, and for the purpose of producing this two plans have been proposed, one of which is to diminish the supply of blood for the development of the embryo by frequent bleedings, the quantity of fluid taken being proportioned to the physical condition of the patient; and the other, to pass an electric current through the sac in which the embryo is contained. These expedients appear to me to be of very doubtful utility, particularly the first, for how often do we meet with pregnant women who by attacks of acute disease have been reduced very much in flesh and strength, but in whom there is no apparent effect produced upon the fœtus other than to cause it to be below the standard in size and weight. In chronic diseases, where the constitution is defective, it is quite common to meet

with miscarriages, and births of still-born emaciated infants; but this is due as much to the state of the general system as to the want of circulating blood for the nutrition of the fœtus. Diminishing the amount of the circulating fluid by venesection may possibly defer the time of the sac's rupture by preventing too great a determination of blood to the point where the embryo is being developed; but that it will produce the death of the fœtus remains to be proved by the future experiments of accoucheurs. With regard to the effects to be derived from the use of electricity and galvanism, time will also tell whether or no they are to prove of any practical use in the treatment of this disease. The value of the electric fluid as a curative agent is as yet very imperfectly understood, and every year, almost, introduces some new application of it. As it has been found of use in the treatment of aneurism it is not improbable that it may also prove useful in extra-uterine pregnancy, provided we can devise some way of applying it to the fecundated cyst so as to send the current through its contents without the risk of producing peritonitis.

The spasmodic pains accompanying preternatural pregnancy are to be treated with opiates, and if any signs of inflammatory action are present, with antiphlogistic remedies. If suppuration of the sac takes place (an event less apt to occur in Fallopian than abdominal pregnancy), and there is any evidence of a disposition in the abscess to open upon the surface of the abdomen, emollient and anodyne poultices should be applied; and an incision made with a bistoury, when the abdominal parietes have become sufficiently attenuated, for the purpose of giving exit to the pus and the debris of the fœtus. If the fœtus can be felt through the walls of the vagina, the vaginal section should be resorted to, or if an abscess point there, the orifice should be enlarged and the contents of the sac removed by manual assistance. The rectum may also be made the means of communicating with the sac, and a number of cases are on record where the fœtus, either entire or piece by piece, has been evacuated through this passage.

With regard to the operation of gastrotomy in extra-uterine pregnancies, there is little to be said that is favourable, and much that is the contrary. From the experience of the past, it is to be looked upon as almost as doubtful an expedient as the ligation of the aorta, yet it has had, and still has many advocates among French surgeons. Those who advise its performance, do not recommend it in the early months of gestation, unless the patient is in immediate danger from the prospect of a rupture of the cyst; and most of its advocates recommend that it should not be resorted to earlier than the seventh month, in the hope of saving the fœtus if the parent perishes. Moreau and Cazeau, in their late works, strongly oppose the operation while there can be any hope of a spontaneous cure, and recommend a resort to it only in cases where the pains of parturition have already commenced, and have not yielded to efforts made to subdue them. They evidently regard this operation as a last faint hope, only to be justified by the speedy prospect of death, and only to be performed when every other means is evidently useless.