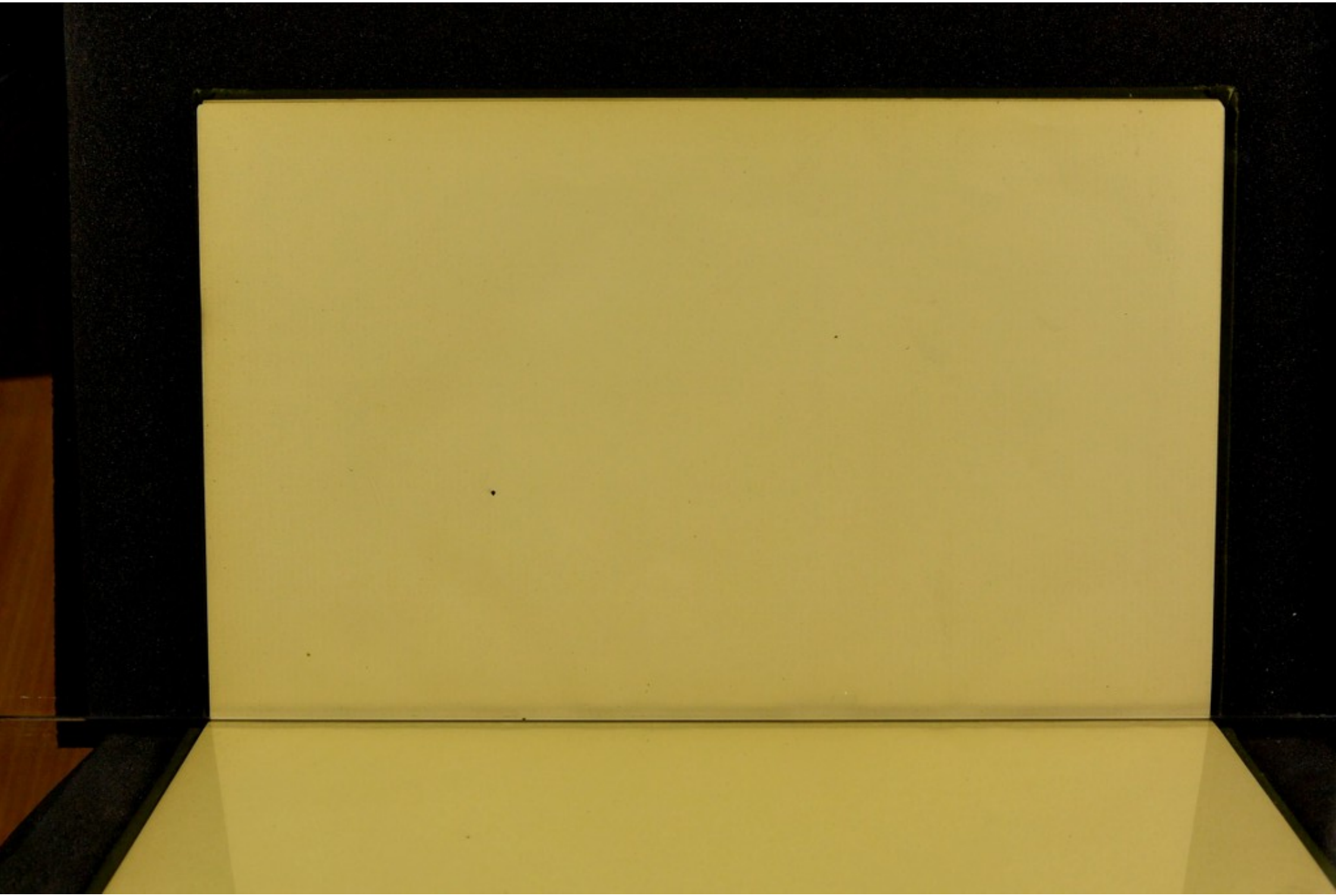
Extra-uterine pregnancy : a discussion with an appendix reviewing Mr. Lawson Tait's Ectopic gestation and pelvic hematocele.

EXTRA-UTERINE PREGNANCY.

TOWNSEND.
PRICE. BALDY.
MONTGOMERY.
WATHEN. DEAVER.
McMURTRY.
VANDER VEER.



EXTRA-UTERINE PREGNANCY

A DISCUSSION.

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VOLUME I., 1888.

WITH AN APPENDIX REVIEWING MR. LAWSON TAIT'S ECTOPIC GESTATION AND PELVIC HEMATOCELE

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APPENDIX.

EXTRA-UTERINE PREGNANCY.

A DISCUSSION.

I. ITS PATHOLOGY.

By FRANKLIN TOWNSEND, M.D.,
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Mr. President and Fellows: In beginning the discussion upon so important a subject as that of extra-uterine pregnancy, I am not unmindful of the necessarily limited time each one has at his disposal, and, therefore, have attempted to condense, so far as possible, that portion of the subject—its pathology—which I have been invited to present. Indeed, much of interest has been already published, both of a theoretical as well as of a practical nature, but it is to be regretted that in all this wealth of literature reference to results from broad studies in comparative anatomy is but scanty.

What a field would this topic place at the disposal of him who might care to unravel these hidden mysteries, in seeking out the analogy between man and the lower animals!

In tracing out pathological conditions we should of necessity refer to histology and physiology, for without these scientific aids to our study we lose sight of the finer shades of beginning morbid processes as differentiated from absolutely normal ones.

From deductions like these then, we should begin our study of the pathology of ectopic gestation, by comprehending the physiological functions of the organs most intimately involved. We should, therefore, know primarily the functions of the Fallopian tubes and ovaries; and, lastly, we are to deduce from such knowledge the physiological processes by which the ovum becomes fecundated, as well as the site of its fecundation. The pathological processes following may then, I think, be more distinctly and definitely traced.

Function of Tubes.—Most authorities are agreed that the functions of the tubes are: First, to transmit the ovum from the ovary to the uterus; and, Second, to permit the passage of the spermatozoa from the uterus in the direction of the ovary. There are a few, and the best of authorities too, who differ from this view, as will be presently shown.

Physiology of Impregnation of the Ovum.—The seat of contact between ovum and spermatozoon has not as yet been determined with absolute certainty. "But in all probability it occurs generally in the ovary itself, or in the vicinity of the Fallopian tubes, seeing that in mammalia after intercourse has taken place the surface of the ovaries is generally covered with spermatozoids." (Bischoff.)

Hermann ascribes to the peculiar movements of the tubes (peristaltic) in the direction of the ovaries, as have been observed to occur in the lower animals, the passage of the spermatozoa through the tubes to the ovaries. (*Human Physiology*, Hermann, 1878.)

"The spermatozoa find their way into the Fallopian tubes, and here (probably in its upper part) come in contact with the ovaries. In the case of some animals impregnation may take place at the ovary itself." This author accounts for the passage of the spermatozoa toward the ovary by: First, their inherent vibratile activity; and, second, by a retrograde peristaltic movement travelling from the uterus along the Fallopian tubes, as has been observed in some animals. (*Text-book of Physiology*, M. Foster, 1885.)

Impregnation of the ovum normally takes place in the tubes, as Gray considers Dr. Allen Thomson has clearly shown. (*Anatomy*, Gray, 1883.)

The place where fertilization of the ovum occurs is either the *ovary* or *Fallopian tube*. Thus the spermatozoa must be able to pass through the tubes to the ovaries, which is probably brought about chiefly by the movements proper to the spermatozoa themselves. "When once the ovum has passed unfertilized into the uterus it is not fertilized in the uterus." (*A Text-book of Human Physiology*, Landois and Sterling, 1886.)

"The usual place for the ovum to meet the spermatozoa, and to be impregnated, is the Fallopian tubes," etc. (Yeo's *Manual of Physiology*, 1888.)

In Prof. John C. Dalton's latest edition of *Human Physiology*

the following statements are found: "The egg, when discharged from the ovary enters the fimbriated extremity of the Fallopian tube and commences its passage toward the uterus." Dalton regards the mechanism as due to the movement of the cilia of the epithelium lining the tube "producing a kind of vortex." He recognizes, also, that the ovum becomes impregnated in the tube. (Dalton's *Human Physiology*, 1882.)

Austin Flint says: "It is probable that the ovum is fecundated either as it enters the Fallopian tube or in the dilated portion near the ovary. (Flint's *Physiology of Man*, 1875.)

"That the spermatozoa make their way toward the ovarium and fecundate the ovum, either before it entirely quits the ovisac or very shortly afterward, appears to be the general rule in regard to the mammalia, and the question naturally arises, 'By what means do they arrive there?'" This author's view in regard to this last question is, that it is due to the inherent power of movement in the spermatozoa. (*Principles of Human Physiology*, Wm. B. Carpenter, 1853.)

Fecundation "usually takes place in the Fallopian tube just outside of the womb." (*A Compend. of Human Physiology*, by Albert P. Brubaker, M.D., 1883.)

"In all instances the spermatozoa make their way by virtue of their vibratile movements," through the whole length of the uterus and "Fallopian tube to the ovary." "It is probable, however, that impregnation generally takes place in the upper part of the Fallopian tube," etc. (*Human Physiology*, Henry Power, 1884.)

Fertilization of the ovum must occur in the Fallopian tube. Chapman speaks of the changes "by which the egg is transformed into the blastodermic vesicle" as appearing "during the passage of the egg through the tube." (*Treatise on Human Physiology*, Henry C. Chapman, 1887.)

It is generally supposed that *it* (the ovum) becomes impregnated by the "sperm cells before it reaches the uterine cavity." "*Where* this takes place exactly cannot for *certainty* be determined; it probably varies, and is possible at any point, as the teachings of extra-uterine pregnancy or gestation show." (*A Manual of Midwifery*, Alfred Meadows, 1876.)

Cazeaux, in his *Theory and Practice of Obstetrics* (Cazeaux and Tarnier, 1886), puts the question as to this point where the ovum

meets the spermatozoon, and says: "Already had the preëxistence of the ovule in the ovary, the occasional occurrence of ovarian and abdominal pregnancies, and the experiments of Nuck and Haighton, which had rendered fecundation impossible, by ligating the Fallopian tubes, tended toward the conclusion that it occurred in the ovary. Still this fact was not actually demonstrated, and it needed the definite proof of finding the spermatozoa on the ovary itself."

"At present there *cannot be a further doubt on this point,* for Bischoff has been fortunate enough *to see them there,*" etc. Since that period Wagner and Barry have made similar observations. "Now such results evidently prove that fecundation sometimes takes place in the ovary. But may it not take place also in the tubes? or even in the uterine cavity?"

"After coitus the spermatozoa make their way through the Fallopian tubes to the pelvic cavity. It is possible, therefore, for the ovum to become fecundated in any portion of the route from the ovary to the uterus." In exceptional cases it may, after being impregnated, develop after being arrested in its course of travel, entirely extra-uterine. Such terms as "abdominal pregnancy," "ovarian" and "tubal gestation," simply express the *site* of attachment of the developing ovum, which naturally is ectopic. (Lusk's *Science and Art of Midwifery,* 1882.)

Of this Leishman says: "The ovum is, as has been shown, developed within the ovary in the Graafian vesicle, and what has been observed in the lower animals leads us to conclude, that while yet it occupies that situation, and even before rupture of the vesicle has occurred, impregnation may occur." On rupture of the vesicle the fecundated ovum passes into the infundibulum of the Fallopian tube, thence by the tube into the uterine cavity, where its further development continues or progresses to maturity. (Leishman's *System of Midwifery,* 1873.)

As additional evidence that the spermatozoon reaches even so far as the ovary itself, and fertilizes the ovum, I may only quote from Parry's great work on extra-uterine pregnancy. Parry does not regard it difficult to conceive that the Graafian follicle might rupture and the ovum yet remain; this act at the same time allows of a better opportunity for the spermatozoa to fecundate the egg in its very shell. "When we remember the processes by which the ovum escapes from the Fallopian tube it may occasion no surprise that it

should be sometimes retained, even after rupture of the vesicle of DeGraaf has occurred."

The following is the course of the fertilized ovum in its passage through the uterus: First, Graafian follicle; second, fimbriated end of tube; third, canal of F. tube; fourth, interstitial (tube within uterine wall) portion of F. tube, or horn of uterus. It may be arrested at any point in this course and continue its development (fetal), just as it does in the uterine cavity. (Hart and Barbour *Manual of Gynecology*, Wood's Library, 1883.)

Barnes ascribes two functions to the Fallopian tube: First, to convey liquids and the ovum by the movements of the cilia covering the epithelial cells of the mucous membrane to the cavity of the uterus. Second, to receive and transmit toward the ovary the spermatozoa of the male. The uterus is regarded by this author as being a thick, hollow, muscular organ, "destined to receive the fecundated ovum," etc.

Coste's observations seem to prove that fecundation is almost always effected either upon the ovary or in the part of the tube nearest the fimbriated extremity, inasmuch as he maintains that the ovule spoils very quickly when it enters the tube without previous fecundation. His views regarding the course of the spermatozoa reaching the ovum are: First, owing to the movements of the uterus and tube, following the direction from the vagina toward the ovary; and, second, to the inherent power of the spermatozoa themselves.

"The statement that impregnation takes place before the ovum has reached the true uterus, seems to me to be an assumption based upon insufficient evidence; indeed, upon no evidence at all. *A priori*, we may safely say that, if it is the rule, Fallopian pregnancies and the disasters which follow them ought to be much more common than they are, and I believe it to be more than likely that the real cause of this accident is the coincidence of a set of circumstances, the most important of which is the destruction or insufficiency of the ciliary movement." (*Diseases of Women*, Tait, Wood's Library, 1879.)

That the uterus is the "meeting-place of the ovum and spermatozoa" is a theory held by Dr. Wyder, and is certainly opposed to the views as just quoted by the most eminent of German, English, and American physiologists, gynecologists, and obstetricians. Wyder regards the appearance of the cilia on the uterine mucosa at

puberty, and their action from without inward as indicating that they are intended to assist the progress of the spermatozoa, while they prevent the too rapid descent of the ovum toward the cervix. The cilia covering the mucous membrane of the tubes, which are present from birth, move in a direction directly opposite; and this movement, taken in conjunction with the peristaltic motion of the tubes themselves, also in the direction of the uterus, as well as the sinuosity of their passages, tends seriously to retard the advancement of the spermatozoa, notwithstanding their inherent power of motion. (*The Medical News*, Vol. 49, Phila., 1886.)

Regarding the function of the tubes and ovaries, Mr. Tait has proven conclusively to my mind that ovulation can and *does* take place before, during, and even after menstruation ceases (menopause); also, that the changes in the ovary at puberty are simply vascular, and that those in the tubes at this period are vascular, muscular, and epithelial, and that the change of *greatest* importance is in the functional movement of these accessory organs—that is, the "grasping," so to speak, of the ovary by the fimbriated extremity of the tube *at only stated times*, viz., *during the menstrual epoch*. Ovulation and menstruation, then, are not necessarily coincident, for, as Tait, Jackson, and myself have shown, it is not always that the passage of an ovum takes place through the tube, though its fimbriated extremity *is* grasping the ovary, since it frequently happens at such time that there is *no ripe ovisac present*.

If, then, as has been shown, ovulation continues intermenstrually, when the tubes are quiescent, the question naturally arises, What becomes of the ovum when the ovisac ruptures? There is only one place it can go, and that is into the peritoneal cavity, where it perishes and is absorbed. Mr. Tait, in speaking on this subject in his work on *Diseases of the Ovaries*, says: "I believe that the ovum falls into and perishes in the peritoneal cavity in by far the greater number of cases, and that the passage of it into the uterus occurs in only a small minority of the ova produced."

Accepting, then, the views of the *majority* of the authorities, that fecundation usually takes place either in the tubes or on the surface of the ovary, or even in the Graafian follicle, or possibly, as has been intimated by Parry, in the peritoneal cavity, and granting the admirable stand taken by Tait, as just dilated upon, it would seem to me that:

1st. Fecundation of the ovum takes place more frequently than is supposed.

2d. That this being a fact, many sterile women—that is, objectively sterile—who never complain of pain or ache, who ovulate and menstruate with the greatest nicety and regularity, and whose general health is perfect—and such, no doubt, all of us present have met with—such women, I say, may frequently have fecundated ova which, like the non-fecundated ova, may drop into the peritoneal cavity and perish, because the soil there is unpropitious for their development.

3d. That occasionally, but rarely I will admit, this same peritoneal soil, if I may be permitted to use such a term, does present a favorable site for the development of the fecundated ovum, and what is called "primary abdominal pregnancy" results.

4th. This propitious site may be due to old peritoneal inflammatory troubles, which may be so slight, indeed, as to have never given rise to suspicion of their existence; such nesting spots in the peritoneum for the development of the young fecundated ovum, though occurring not so frequently as those inflammatory changes in the tubes causing desquamation of the ciliated epithelium, and thereby tubal pregnancy, as Mr. Tait so ably advocates, *are*, nevertheless, to *my* mind, a factor of causation of the so-called "primary abdominal pregnancy."

From the physiological proofs, as already cited, I am convinced that extra-uterine fetation can and does occur either in the Fallopian tubes (by far the most frequent form), *in* the ovary, or *upon* it, and even in the peritoneal cavity; and I must truthfully say, that in the study of any given case of misplaced conception, one of the most perplexing questions to decide is, as to which class it properly belongs: whether tubal, ovarian, or abdominal. This is assuredly true, not only while the patient is living but after her death, and I can heartily endorse the views of Parry, when he says, "that notwithstanding these common and insuperable difficulties which the pathological anatomist may encounter, even under the most favorable circumstances, a large number of physicians do not hesitate to classify their cases, even when their patients have been carrying the products of a misplaced gestation for years. These remarks apply not only to the statements of physicians who have observed only one case, but to those accoucheurs who have seen many. The result

is that special treatises, as well as periodical literature, teem with statements which are decidedly unreliable and calculated to mislead those who attempt investigating this subject."

Tubal Ectopic Gestation.—By far the most frequent form is tubal ectopic gestation, ascribed usually to a number of causes, as catarrh of the mucous membrane, causing possibly a loss of the ciliated epithelium, allowing thereby the fecundated ovum to rest and develop in the denuded spot; flexions of the tubes; and dilatations with hernial pouches, produced by the protrusion of the mucous membrane through separate bundles of the muscular fibers (Lusk). Constrictions from inflammatory changes causing adhesions, obstructive catarrh, physiological aberrations, or even paralysis, etc., have all been assigned as factors.

Naturally the pathological changes taking place will vary according to the duration and behavior of the pregnancy. As the growth of the ovum continues, the mucous membrane of the tube thickens, the tubes themselves gradually distend, the villi enter into the mucous membrane, and, according to Bandl, "the two poles of the decidua-like covering are closed, though sometimes the uterine end remains open and in continuity with the mucous membrane of the tube and the decidua of the uterine cavity." Hennig remarks that a decidua reflexa is rare.

The villi continue in their growth, penetrating the mucous membrane to the muscular layer, but, according to Leopold, never breaking through the walls of the maternal vessels; nor are any evidences of blood to be found, as is presumed to exist in intra-uterine development, between the villi. The vascularity of the vessels of the tubes and those of the broad ligament in which they lie is greatly increased, the muscular fibres of the tubes, enlarging at first, subsequently become markedly thin by stretching from the continued and increasing pressure due to the growth of the ovum, which finally ruptures the tube, usually between the second and third months. According to Mr. Tait, the most common seat of rupture is through the surface of the tube into the cavity of the peritoneum, because, as he says, "the proportion of the circumference of the tube which is covered by peritoneum is very much greater than the proportion of the circumference of the tube which is related to what is called the cavity of the broad ligament." As a result of such tubal ruptures the placenta is frequently lacerated

and the hemorrhage excessive which pours into the peritoneal cavity, death being frequently due to shock, hemorrhage, or, if not from either of these, purulent peritonitis is apt to develop.

Associated with the rupture in the wall of the tube may be that of the ovum, with the escape of the fetus into the peritoneal cavity, or, it may be that the ovum remains *whole*, and in *such* condition falls into the abdominal cavity. Should the ovum, though, remain in the tubes, which is rare indeed and most favorable, the extent of the hemorrhage may be lessened. Spiegelberg mentions three instances where this form of extra-uterine pregnancy advanced to full term, and Hofmeier still another. In all three cases the enormous muscular development in the tubal walls was characteristic. Fatal as this form of ectopic gestation usually is, recovery *may* occur in case of premature death of the fetus before the tube gives way; and even after rupture has taken place recovery is possible, owing to the formation of inflammatory false membrane around the embryo of the entire ovum. Should the tube rupture at any point not involved by the peritoneum, the folds of the broad ligament become separated by the effused blood, forming a cavity, into which the ovum may fall, and either become destroyed or continue developing up to the fourth, fifth or sixth month, when it usually dies. Then we have, according to Tait, "a group of cases in which, after suppuration has taken place, the bones of the fetus are discharged through the rectum, through the bladder, or through Douglas's cul-de-sac into the vagina, or sometimes a lithopedion results. The minority proceed to the full time and are removed either as living or as dead children" from an extra-peritoneal cavity.

Ovarian Pregnancy.—So long ago as the latter part of the seventeenth century, St. Maurice demonstrated a case of ovarian pregnancy. Since that day a number of cases of this very rare condition have been recorded, as those of Granville, Porter, Kammerer, and Bandl, supported by the thorough investigations of Marimus of three preparations found in the Pathological Museum of Wurzburg, which prove unquestionably the presence of gravid ovaries. In Porter's case the woman died from rupture at between the sixth and seventh week of gestation in her fourth pregnancy. The autopsy revealed the left ovary greatly enlarged, *containing the gravid sac*, while the Fallopian tube on the same side was found "*floating free and impervious.*" In ovarian fetation, as is usual, the cyst is void

of a peritoneal investment, the walls of the Graafian follicle and the stroma of the ovary forming the envelope about the developing ovum. The chorion is in intimate relation with the interior of the sac. Subsequent to fecundation the Graafian follicle may close and the ovum continue extra-peritoneal, or the ovum may gradually make its way through the opening occasioned by the escape of the Graafian fluid, and thus come to lie eventually for the most part within the peritoneal cavity. In either case rupture of the sac takes place early, though, when the sac walls are reinforced by inflammatory adhesions to the peritoneal coverings of the adjacent viscera, gestation at full term may be reached.

ABDOMINAL PREGNANCY.—*Primary, Secondary.* As was shown in an earlier part of this paper, ova frequently becoming fecundated, drop into the abdominal cavity and perish, the soil being unpropitious for their further development; occasionally it happens, though, as has been demonstrated, their death is not so imminent, and their growth may continue for an indefinite period. Now, the pathological changes occurring in this form of "primary abdominal pregnancy" must be distinguished from those that take place in that form which is termed "secondary." In the one instance we have so minute, soft, fragile, and delicate a corpuscle deposited in the peritoneal cavity that one could not well imagine any grave inflammatory results accruing from its immediate presence. This being the case then, the contiguous abdominal organs will not be injured by its ulterior development, because, as Cazeaux remarks, they gradually become habituated to it, and the ovule having obtained a right of possession, "lives, grows, and presents to the smooth, polished surfaces which touch it, a surface equally smooth, polished, and moistened at their expense, and not having occasion for any other protecting envelope, no cyst is formed," the ovum being simply surrounded by the chorion and amnion.

On the other hand, in the secondary form of intra-peritoneal pregnancy, we have a voluminous product of conception suddenly thrust upon the peritoneum, accompanied by large quantities of blood, wounding possibly, irritating certainly, this membrane so unaccustomed to such harsh intrusion. Here the ovum acts the part of a foreign body, soon determining an acute inflammatory process about it, that possibly may form a cyst wall made up almost wholly of plastic lymph, which completely isolates it from

the rest of the peritoneal cavity. If the fetal cyst ruptures and the contents escape from the amniotic cavity into the midst of the intestinal mass, a renewal of the inflammation occurs and the cyst just described forms around *it*. As a rule, the fetus perishes at, or soon after, the time of rupture; still, there are cases recorded, notably by Bandl, where it continued developing even within a sac formed of proliferating connective tissue. With the death of the child it may be converted into a lithopedion, or, through the blood-supply of the connective tissue, it may be preserved for years in its soft integrity.

In all cases numerous and greatly exaggerated vessels form in the cyst walls, the rupturing of which frequently causes almost instant death from hemorrhage. Sometimes, especially when the pregnancy is prolonged, these walls may become destroyed by perforating fistulous canals, running in various directions, frequently communicating with the intestines, vagina, uterus, bladder, or even with the abdominal parietes, and thus directly into the external world. Through these fistulous channels the skeleton portions of a putrescent fetus frequently find their exit. This change is undoubtedly more frequent than that the fetus should be transformed into osseous or cretaceous substance, or even adipocere. Beside these varieties of extra-uterine fetation, Bandl, as already mentioned, records histories of the coexistence of extra- and intra-uterine pregnancies, "the latter occurring at the same menstrual period as the former, or possibly after the death of the extra-uterine fetus."

Placenta.—In all forms of ectopic gestation the connection between the ovum and the abnormal surface upon which it is engrafted, is established by a vital adhesion between the chorionic villi and the tissues with which they come in contact, plastic material helping to cement them as it were. This has been demonstrated thoroughly by Braxton Hicks and Engelmann. As there is here absence of the decidua, the process differs from that found in the uterus, where the sub-ovula portion (the serotina) performs an important and active part in connecting the ovula and maternal tissues by proliferating cell activity.

The Uterus in Ectopic Gestation.—From researches made by Clark, Oldham, Virchow, Ramsbotham, Cazeaux, Kiwish, Hodge, Hennig, and others, it would seem fair to conclude that the uterus is enlarged even in the early stages of ectopic gestation; that it undergoes changes which are the normal preparatory trans-

formations for the reception of the ovum. A decidua forms in its cavity, which is seldom retained until the completion of gestation. On the contrary, it is usually expelled during the early stages of gestation *en masse*, with pain and symptoms of abortion, or it may be discharged in shreds and pieces without symptoms.

And now, gentlemen, I take pleasure in exhibiting to you a most perfect specimen of a "lithopedion," beside that of the cyst walls which incased it, as well as the uterus and adnexa, all carefully removed (post-mortem) from the abdominal and pelvic cavities of a woman almost thirty-seven years ago. The specimens are the property of the Albany Medical College Museum, Albany, N. Y., and are most interesting and useful in clearly demonstrating the views as already stated in my discussion relative to "Primary Abdominal Pregnancy."

With the specimens I likewise submit a report of the case, as compiled by the late Prof. J. H. Armsby, of Albany, N. Y.

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REPORT OF DR. PARKHURST'S case of extra-uterine conception, by the late DR. ARMSBY, of Albany, N. Y.

"The specimens from which the following illustrations were taken were obtained at a post-mortem examination held by Dr. Parkhurst, in the presence of about twenty persons, upon the body of Mrs. Amos Eddy, aged seventy-seven, of Frankfort, Herkimer County, N. Y. Mrs. Eddy's maiden name was Rebecca Smith. She was born in Frederickstown, Columbia County, N. Y., in 1775, of English parents. Her mother, Sarah Smith, gave birth to twenty-four children, of whom four pairs were twins, Rebecca being the twelfth child. Mrs. Eddy was married in New Lebanon, Columbia County, N. Y., in 1795, at the age of twenty, and removed with her husband, Amos Eddy, to Frankfort, Herkimer County, N. Y., where they both lived and died, he at the age of seventy and she at seventy-seven. She became pregnant in 1802, seven years after her marriage, and died in 1852, carrying this fetus fifty years.

"No unusual symptoms attended her pregnancy; the catamenia ceased; quickening was felt at the usual time, and the motions of the child increased with its growth.

"At the expiration of eight and a half months she had severe labor pains following a sudden fright from the falling of a vessel into the fire, while she was engaged in cooking. Her physician, Dr. Farewell, of Litchfield, was called; the labor pains continued for several hours with regularity and force, but at length subsided and she remained comfortable for two or three weeks. Her health then began to decline, and the full period of pregnancy having passed by, her friends became extremely anxious and availed themselves of the advice of Drs. Guiteau, Hull, Coventry, White, and others. For a considerable time she was confined to her bed, and, after a year and a half of extreme suffering, her health began to improve and was finally restored. During the remainder of her life she enjoyed good general health, but suffered occasionally from severe attacks of pain in the abdomen which resembled labor pains. After her health was restored her catamenia returned and continued until the age of forty-five. She travelled much about the country and consulted various medical men, among others the late Prof. Willoughby, of Fairfield Medical College. Her health continued remarkably good up to the time of her death, and at the age of seventy-six she was accustomed to walk five miles from her residence to the village and back again.

"The specimen with its covering cyst (see illustrations) weighed eight pounds at the time of its removal. The external surface of the envelope was smooth and white, composed of concentric layers of fibro-cartilage, varying at different points from a line or two to three-fourths of an inch in thickness. It had no connections with the abdominal viscera or walls but was slightly attached to the Fallopian tubes and omentum. The external surface of the fetus was encrusted with an earthy substance of sufficient thickness to preserve its form when dried. The interior seems to be a soft substance resembling adipocere."

EXPLANATION OF PLATES.

PLATE I.—To the left is the lithopedion—side view.

To the right is an anterior view of the external surface of the walls which encased the fetus, made up wholly of inflammatory products.

Lying directly in front of this inflammatory sac is to be seen the uterus with its anterior surface up, the os externum prominent, and, running off from either side, are to be noticed the Fallopian tubes and ovaries; besides, inflammatory bands are adherent to the surface of the sac.

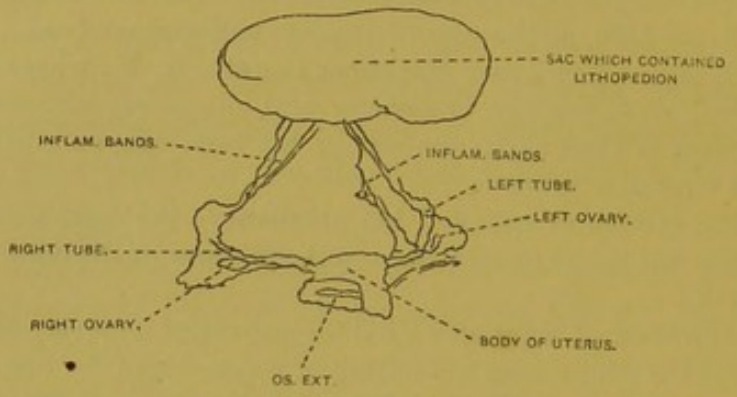
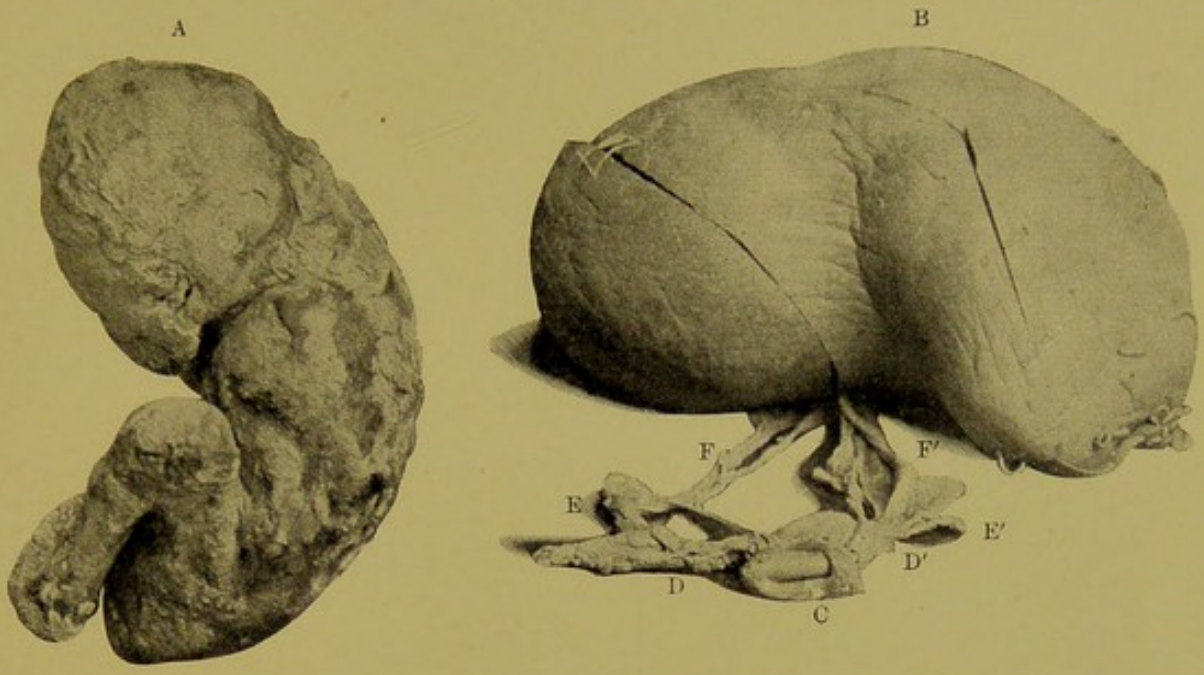


PLATE II.—To the left is the lithopedion—front view.

To the right is a posterior and inferior view of the inflammatory sac which contained the fetus, its walls being broken open when removing it from the abdominal cavity; the thickness of which is to be noted, also the view of the interior of the sac. The shaggy portion shows the large amount of old adhesions from inflammatory deposit.

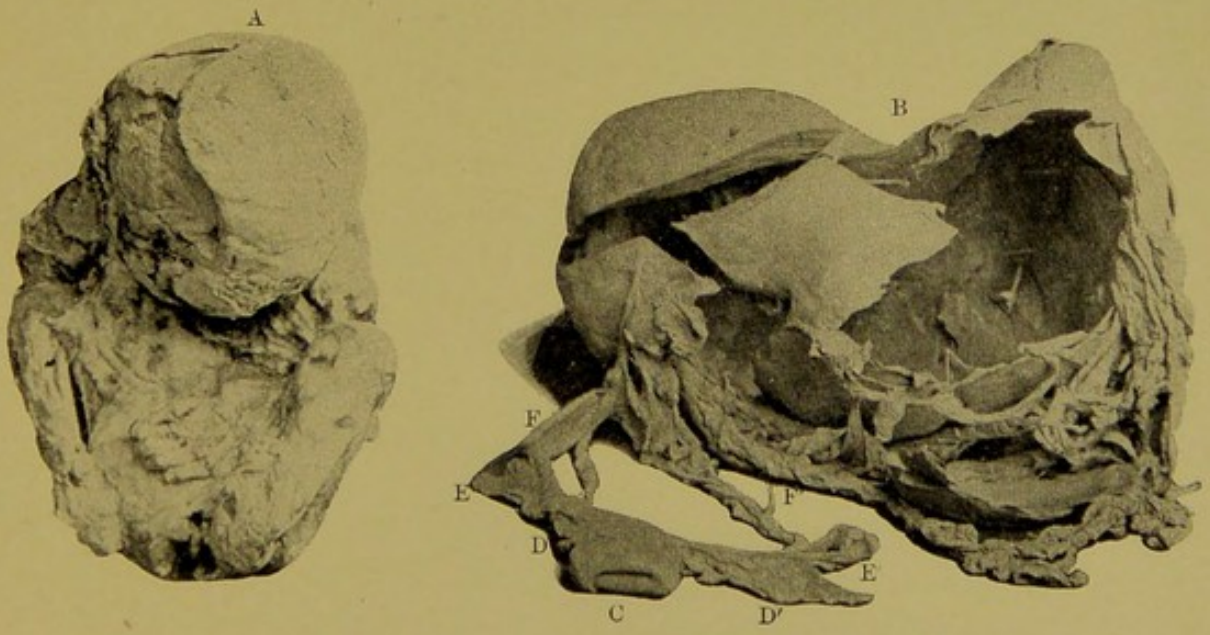
The uterus—posterior surface, with tubes and ovaries—is plainly to be seen.

PLATE I.



A. Lithopedion. Side view.
B. Inflammatory sac of lymph, originally containing Lithopedion. Exterior view.
C. Uterus. Atrophied.
D D′. Fallopian Tubes. Unruptured.
E E′. Ovaries.
F F′. Adhesions of inflammatory lymph.

PLATE II.



A. Lithopedion. Anterior view.
B. Inflammatory lymph sac, originally containing Lithopedion. Interior view.
C. Uterus. Atrophied.
D D′. Fallopian Tubes. Unruptured.
E E′. Ovaries.
F F′. Adhesions.

II. ITS DIAGNOSIS.

By JOSEPH PRICE, M.D.,
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In inaugurating the discussion of the diagnosis of extra-uterine pregnancy I desire to be as brief and pointed as possible, and for this reason I have generalized the subject and omitted all allusions to the literature. The literature of extra-uterine pregnancy is scattered through a vast number of periodicals, and consists, for the most part, of descriptions of cases occurring in the practice of the writers. The discussions of Mr. Lawson Tait and the classical work of Dr. John S. Parry have proved of the most value to me.

Accepting, as I do, the proposition of Mr. Tait, that all extra-uterine pregnancies are primarily tubal and that all the so-called varieties depend upon the location of the ovum in the tube and the location of the point of rupture of the tube, I have divided the subject for the sake of the discussion of the diagnosis into three classes: *First*, extra-uterine pregnancy before the rupture of the tube; *second*, at the time of rupture of the tube; and *third*, after the rupture of the tube.

Rupture of the tube is not synonymous with rupture of the fetal sac, for, though rupture of the tube and sac generally occurs at the same time, it sometimes happens that the tube ruptures and the sac remains intact; and this may in part explain the fact that cases sometimes occur in which the tube ruptures without causing exhaustive hemorrhage.

The diagnosis of extra-uterine pregnancy before rupture of the tube is rarely made, and when it is made, is of necessity not positive, because the same set of symptoms may arise from a number of pathological conditions; for example, a retroflexed gravid uterus, an ovarian cyst, a uterine fibroid, and hematosalpinx, have all been mistaken for tubal pregnancy, differential points of diagnosis not being clearly presented. Moreover, the physician rarely sees such cases until rupture has taken place. When such cases are seen

they are generally in patients exceedingly anxious to conceive, who, after a long-continued sterility, have reason to suspect themselves pregnant; or by patients who, having missed one or more menstrual periods, are anxious to know their condition.

The symptoms they present are as follows: *First*, partial or complete cessation of menstruation for one or more periods, generally accompanied by other rational symptoms of pregnancy, though occasionally these are all wanting; *second*, pain which is peculiar, being generally severe, paroxysmal, and long continued—a sickening pelvic pain, which is neither cramp-like nor colicky, though it is often described by these terms—these pains, probably caused by the distention of the tube, are apt to subside for a time only to recur; *third*, the appearance of uterine hemorrhage, which is again peculiar in that it is usually irregular, both as to time and quantity, generally lighter in color than the normal discharge and containing *shreds of tissue* which are portions of the decidua vera.

The occurrence of these symptoms justifies a physical examination, when the general condition of the vagina and cervix may or may not be found to correspond to normal pregnancy. The uterus is generally enlarged and pushed out of place by a tender or exceedingly painful cystic mass, occupying the position of one or the other of the tubes. This cystic mass at this period is freely movable. A differential diagnosis is extremely uncertain, and care must be taken not to exclude pregnancy hastily because of the *apparent* return of catamenia, nor to conclude that *miscarriage has taken place on account of the appearance of tissue* in the discharge, nor to pronounce the trouble some other pelvic tumor while rational symptoms of pregnancy exist in fact. Some of the tumors liable to be mistaken for extra-uterine pregnancy have been mentioned, *and when*, as *sometimes occurs*, the fetus and placenta die before the rupture of the tube, the difficulty of differential diagnosis is *practically insurmountable.*

These symptoms continue as the pregnancy advances. The tumor, as it increases in size, causes additional symptoms by pressure on the bladder and rectum until rupture occurs. Rupture takes place almost always between the eighth and fourteenth weeks of pregnancy—in a majority of cases before the twelfth week. Now, the symptoms vary somewhat, according to the point of rupture in the tube—whether into the peritoneal cavity or below it.

If it takes place into the peritoneal cavity—as on account of the anatomical relations of the tube it is prone to do in a large majority of cases—the symptoms suddenly become most alarming. The patient is seized with agonizing pelvic pain, shows all the symptoms of internal hemorrhage and shock, goes into syncope, collapse and death. That this end is more frequent than is generally supposed is shown by a statement made to me by a well-known pathologist, Dr. Formad, Coroner's physician of Philadelphia, that within a very short period he had found in his post-mortem work eighteen deaths due to ruptured tubal pregnancy—a class of cases which for many years had been grouped as death due to accidental hemorrhage. These deaths all occurred before the twelfth week of pregnancy.

Where death does not immediately supervene the recovery from shock is gradual, the attacks of syncope often recurring. The patient presents an exsanguinated appearance; uterine hemorrhage generally occurs; symptoms of peritonitis, localized or general, make their appearance, and the patient slowly recovers only to undergo another attack of the same kind. A physical examination now may or *may not* disclose *characteristic lesions;* when it does the uterus is found enlarged, displaced and fixed, and a tumor will be found occupying the position of the pregnancy. This examination, however, is often unsatisfactory, for the tube may discharge its contents beyond the reach of the *examining finger;* or the adhesions may so fix the whole vault of the vagina that nothing can be made out. The diagnosis must be made from the history of the case and the condition of the patient. The liability of multiparous women to extra-uterine fetation must be borne in mind, and the occurrence of the above catalogue of symptoms in such a patient must be given immediate and serious consideration.

As has been said, these attacks may be *recurrent*, and it has been demonstrated by operative disclosures that hemorrhage may *cease* entirely for a time only to recur with renewed violence, or may continue in small quantity as long as the patient *has any blood to lose*. If the patient survive thus far, the symptoms of purulent peritonitis or of a more or less severe septicemia set in, when finally death relieves the suffering woman.

When rupture occurs below the peritoneum these symptoms are rarely so severe, and may, indeed, be scarcely noticed by the patient,

the pain of rupture seeming to be only a transitory pang of colic. The hemorrhage is rarely or never fatal at the time of rupture—easily accounted for by the anatomical relations. The syncope, if occurring, is evanescent. The discomfort of bearing-down sensations is frequently complained of, difficulty of micturition and defecation is increased, but the patient recovers power very readily. Here, again, recurrent attacks mark the progress of the case and the ultimate outcome depends on whether the fetal sac is ruptured or not. Examination at this point will reveal a sensation of bogginess and distention in the pelvis—precisely that of a pelvic hematocele and often the body or extremities of the fetus. The symptoms of peritonitis are wanting generally, and if examination be not immediate the distention may in a large measure disappear, not necessarily by reabsorption but by extension through the connective tissue spaces of the pelvis. If the fetal sac has ruptured the fetus dies, and if the condition is not recognized and relieved by operative measures the patient goes into a state of chronic invalidism—the victim of obscure pelvic troubles—until nature relieves her as much as possible by disposing of the misplaced products of the accident. Sometimes the patients recover fair health and comfort.

In a small minority of cases the fetal sac is not ruptured, and now the progress of gestation is similar to the normal until full term, providing a secondary rupture into the peritoneal cavity does not occur. This may oocur, and when it does it kills immediately, the symptoms being those of the primary rupture greatly magnified.

After quickening, the doubts of pregnancy are settled and the question is the location of the fetus, whether within or without the the uterus. The metrorrhagic discharge may have ceased by this time, especially so if the entire decidua has been thrown off. The severe paroxysmal pelvic pains may be very infrequent or have ceased altogether. The mammary changes are as in normal pregnancy, but the fetal movements generally cause more discomfort, and are spoken of as being entirely on one side. The fetal heart sounds and the placental bruit are usually intensified, and as the fetal sac enlarges it produces unusually distressing pressure-symptoms on rectum, bladder, and bloodvessels. Physical examination is the only mode of determining the diagnosis. Examination of the abdomen will generally show the fetal tumor decidedly on one side or the other. Occasionally the fetal extremities may be felt very distinctly

and even appear as projections on the abdominal wall. This, however, is of no use unless in conjunction with other more distinctive signs. The fetal sac is generally less movable than the gravid uterus. The fundus uteri can frequently be felt as a distinct mass on the fetal tumor. Vaginal examination shows the uterus enlarged, *but not in proportion to the duration of pregnancy;* generally displaced to one side, in front, or beneath the tumor. The cervix is enlarged and soft as in normal pregnancy, *but not in proportion to the duration of pregnancy.* The cervix is also greatly displaced. The pelvis is filled with the fetal sac, which gives the sensation of fluctuation or of semi-fluctuation, and frequently a part of the fetus may present. The fetus sometimes is so plainly felt as to leave the impression of a presenting part covered only by membrane. This, however, is not peculiar to extra-uterine pregnancy. If the patient carries the extra-uterine gestation to term, spurious labor will take place. It is accompanied by metrorrhagia and sometimes followed by a vaginal discharge resembling the lochia. After this spurious labor the fetus dies and is disposed of in a variety of ways by nature. A discussion of these ways lies outside the province of this paper. I have also purposely omitted any discussion of such grave occurrences as extra-uterine pregnancy occurring in a hernial sac, twin extra-uterine pregnancies, or extra- and intra-uterine pregnancies combined, for the reason that I have desired to make my remarks so general as to leave the way open for a very *full and free discussion.*

III. ITS TREATMENT.

By E. E. MONTGOMERY, M.D.,
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When asked to take part in this discussion I choose the surgical treatment. While my subsequent study of the subject has not induced me to depreciate the value of surgery, it has caused me to have a higher appreciation than I before held of the possibilities of treatment by electricity. The method and urgency of treatment must, of necessity, depend upon the form of extra-uterine pregnancy we have under consideration.

It is recognized that the ovum may become impregnated and arrested at any point in its progress from the ovary to the uterus; indeed, it may develop in the Graafian follicle, forming a true ovarian pregnancy. The forms recognized are tubal, tubo-uterine or interstitial, tubo-ovarian, ovarian, and abdominal. It will be readily comprehended that these various forms are only distinguishable as such during the early periods of pregnancy. As the ovum grows, and the surrounding tissues become involved, it is difficult to determine in what organ it had its first implantation.

The course of the gestation varies, however, according to the original site. Thus, the tubal variety, owing to the limit to the growth and dilatability of the tube, ruptures from the sixth to the twentieth week, while the ovarian or peritoneal varieties may go to the completion of pregnancy without untoward circumstances.

These forms must, of necessity, present symptoms of a different character. Hence the purely tubal early presents marked and typical symptoms. The first experiences do not differ from those of ordinary pregnancy, such as missed menstruation, nausea, feelings of depression, sleeplessness, swelling of the breasts, etc.; later, we have them complicated by characteristic symptoms, such as pain in the abdomen, in one or other inguinal region, sensation of pressure, attacks of fainting, severe pain occurring in paroxysms, often so acute and

lancinating as to cause the patient to fall, and even render her unconscious. The first attack may be accompanied by symptoms of collapse and internal hemorrhage so marked as to demand immediate laparatomy, or these may occur as frequent attacks during a period of some months. The attack may be accompanied by uterine discharge of a bloody character, leading the patient to believe that it is a return of the ordinary menstruation. An examination of the fluid will usually disclose the presence of a decidual membrane, thrown off either as a cast or in shreds. The presence of this symptom in a woman who has not before suffered from dysmenorrhea is almost a pathognomonic indication of extra-uterine pregnancy. In the other forms the patient may suffer so little distress that she does not mistrust the grave form of the pregnancy. She reaches what she supposes the completion of the pregnancy, when, after a futile attempt at labor, the fetus dies and may undergo one of various forms of retrogression. It may become macerated and disintegrated, causing the formation of an abscess which opens through the abdominal walls, the vagina, the bladder, or the intestinal canal.

Dr. Brown (*Virginia Medical Monthly*, 1884) relates the history of a colored woman who had been married sixteen years without having reason to believe herself pregnant, in whom, after considerable disturbance of the bowels, there was found a bone projecting from the anus. An examination revealed the greater portion of a nearly mature fetal skeleton in the rectum, which, after some difficulty, was removed.

Such an elimination of the fetus may continue over a period of years and the patient subsequently regain good health. In other cases, the influence of the absorption of septic material furnished by the decomposing and macerated fetus may lead to a fatal termination. The fetus may become encysted, or form a lithopedion, which has been carried in rare cases as long as fifty years without producing any unfavorable symptoms. In the peritoneal or abdominal form, the envelope of the fetus is partially composed by the gluing together of the intestinal loops and the viscera of the abdomen in proximity to it. In such cases the symptoms will depend largely upon the site of the placenta. If, in its growth, it becomes attached to the intestines, it generates such a congestion of the intestinal structures as to lead to violent catarrhal symptoms, such as vomiting and

purging, frequently recurring, severe intestinal pains. The only relief is in the arrest of the vitality of the ovum.

In the tubal varieties early rupture is the most frequent result. This may occur suddenly with the first attack of pain experienced, or there may be a number of attacks to warn patient and physician of the impending danger. In the interstitial form the rupture may occur either into the uterine canal or the abdominal cavity. Indeed, cases have occurred in which the rupture has taken place into both simultaneously, as in the case described by Maschka, in which the autopsy upon the body of a servant girl disclosed the head of the child and the placenta in the abdomen, while the body was found secreted in the room. The rupture of the tube is usually accompanied by profound shock, symptoms of collapse, and internal hemorrhage. A number of cases are upon record in which the shock of rupture was so great as to render the patient unconscious, and to lead to an immediately fatal termination. In other cases, where death is not immediate, the hemorrhage is not arrested and results fatally.

As the various forms of the disease present such a variety of symptoms, we can readily understand that our treatment must depend somewhat upon the form with which we are confronted.

As we have seen, from an investigation of the literature, that the more or less matured fetus may become encysted or form a lithopedion, producing little or no disturbance during a long period of years, we are justified in hoping that a plan of procedure may be advanced by which the vitality of the ovum may be arrested in its earlier stages, when its products are of such a character as will admit of being readily absorbed and eliminated. To accomplish this end various procedures, such as puncturing the cyst and the injection of morphia, have been practised. These methods are either uncertain or attended with more or less danger. Electricity, however, affords an agent for the destruction of fetal life, which experience discloses can be relied upon for the arrest of development and the speedy and safe cure of our patients. I am aware that in entering upon the discussion of this procedure I am advancing upon a field that has been fiercely debated; but, in the decision of the value of this agent, we cannot accept the dicta of men who are ignorant of the manner in which it is used, or of those who condemn it without a trial. An agent which is capable of arresting the life of mice and insects by passing a charge through a vessel of water in which they

have been placed, as shown by the experiments of Landis, should be effective in destroying fetal life when brought in close contact with the fetal envelope. Its method of action is not electrolytic—the proper method of use is not by puncture. The ovum is brought within the circuit of a faradic current by placing one pole over the abdomen and the other against the sac, either in the vagina or rectum as may be most convenient, and a current employed as strong as can be comfortably borne for ten or fifteen minutes. This should be repeated once or twice daily for several days. Usually from two to five applications are sufficient to accomplish the arrest of development.

Naturally, among those who would discredit the efficacy of this agent the correctness of the diagnosis is questioned. It is possible that, in some of the reported cases of cure by electricity, the operators may have been at fault as to the condition. But it is not probable that in a large series of cases, many of them seen by several men of unexcelled prominence and experience in the diagnosis and treatment of abdominal and pelvic troubles, an error should have been made in every case. If it would prove successful in one case, there is no reason why it should not in many. The abdominal surgeon meets us with a number of objections—as, the uncertainty in our diagnosis; the possibility of the continuation of the growth of the placenta even after the death of the fetus; and, finally, that the presence of this foreign growth is a standing menace to the health of the patient—all of which he claims are obviated by laparatomy.

But an agent that will enable us to dispel an abnormal condition which presents all the symptoms of extra-uterine pregnancy, such as the subjective signs reinforced by the presence of a tumor in the pelvis—a tumor that was growing as we would expect an ectopic gestation, which was accompanied by the discharge of a decidual membrane—such an agent, I say, should not be hastily cast aside. The growth of the placenta is, at least, entitled to the Scotch verdict of "not proven." Should the expected dangers result from the presence of the residuum of the ovum laparatomy may be performed.

Electricity has the advantage that it does not require a special amount of skill for its administration, hence can be practised where life would be sacrificed had we to depend upon the abdominal surgeon. Then, too, we that practise abdominal surgery are aware that cases will come to us that we are unable to impress sufficiently

with the gravity of their position, to induce them to undergo what they regard as a difficult and dangerous operation.

In those cases in which there has been a gradual rupture of the tube, and development of the embryo has taken place between the folds of the broad ligament, electricity seems to us the easiest way out of the difficulty. The agent is, however, of limited application. It is better fitted for the treatment of ectopic gestation of the first four months. After this period the danger to the individual would be enhanced by the indefinite retention of the dead embryo. Even after this period, however, in view of the frequently dangerous hemorrhage from the placental vessels, it seems to us that it would be good treatment to destroy life by electricity and await the coagulation of blood in the vessels, before proceeding to laparatomy.

Tubal pregnancy is regarded as presenting the gravest prognosis. This form rarely goes beyond the fourth or fifth month without rupture. Such an occurrence, aside from the effects of shock produced by the escape of the contents of the sac into the peritoneal cavity, is a source of danger through free and uncontrollable hemorrhage. In rupture the better plan of procedure is abdominal section, although Freund opposes operation, directing rather to wait and treat anemia and peritonitis. He quotes a large series of successful cases as justification of such advice. An analysis of his cases, however, shows that convalescence is of long duration. Laparatomy has been earnestly and ably advocated by Tait. This operation enables us to ligate the bleeding vessels and diminish the danger of peritonitis and septic conditions, by the removal of the blood and sac contents from the peritoneal cavity.

Tait and his school of abdominal surgeons advocate abdominal section when the existence of ectopic gestation is strongly suspected; but we would prefer, at any time before the fourth month, the application of the faradic current. After the fourth month we would still recommend the destruction of life by the electric current, and that abdominal section be postponed for some weeks, until obliteration of the placental vessels has had an opportunity to take place. By such a course we increase the probability of successful removal of the placenta and lessen the danger of hemorrhage. Where the fetus is living and viable, laparatomy should be done to save the lives of both individuals. The operation under such circumstances should

be done with the greatest care, so as to avoid separation of the placenta and the resulting hemorrhage.

This operation is denominated by Harris and other obstetrical writers, the primary operation. The results, according to the careful and painstaking researches of Harris, are exceedingly unfavorable. Of twenty-five cases operated upon in seventy-four years, but twenty-three recovered. He says this mortality can be lessened only in one of two ways:

1. By ligation of the vessels supplying the placenta and its removal with the cyst.

2. Treating the placenta antiseptically to prevent its decomposition.

Probably the best method of treating such cases is that of Martin, who makes a puncture from the most dependent portion of the sac into the vagina, through which the cord is passed and a drainage-tube inserted; the sac above is sewn up to close its cavity to the peritoneum.

To resume, we would recommend the following plan of procedure:

1. In every form of ectopic gestation prior to the fourth month, the destruction of the embryo by electricity (faradic current).

2. Between the fourth and sixth months, destruction of life by electricity and some weeks later laparatomy.

3. In rupture, immediate laparatomy with removal of sac, contents, and effused blood.

4. In cases that have passed the sixth month, wait until viability is well established and perform laparatomy; observe every precaution that separation of the placenta does not occur, close the sac above, and drain through the vagina.

5. In case of the death of the fetus it should be removed by laparatomy a few weeks later.

6. Where the fetus has become macerated and abscess has formed, its sinus should be enlarged and the fetal residuum removed.

IV. OBSERVATIONS—CLINICAL, PATHOLOGICAL, AND SURGICAL.

By W. H. WATHEN, M.D.,
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It was not my purpose to say anything upon the learned papers just read by Drs. Townsend, Price, and Montgomery, for they will be discussed by other men of experience, but I beg you to bear with me a few minutes while I offer some suggestions—clinical, pathological, and surgical—on this interesting topic.

Mr. Lawson Tait has done more than anyone else to correct the false, but generally accepted, theories about the etiology and the pathology of ectopic pregnancy, and, with a few exceptions, I fully concur in his views. All ectopic pregnancies must begin in the Fallopian tubes, with the possible exception of ovarian pregnancy, and this cannot occur unless the ovule is held in the Graafian follicle after its rupture, and becomes impregnated there; but I do not believe that ovarian pregnancy has been positively demonstrated. An impregnated ovule cannot form villous and placental attachments unless it is held by the maternal structures nearly immovable in one place, hence the impossibility of fixation in the abdominal cavity, where the peritoneum and other structures are in nearly constant motion; and, were the ovule to fail to enter the tube, it would become dead matter and be absorbed by the peritoneum before fixation could occur. All abdominal pregnancies become such by secondary rupture, the cyst having primarily ruptured into the folds of the broad ligament before the end of the twelfth week of gestation. If the primary rupture is into the abdominal cavity, death is the usual result, unless the sac is removed by abdominal section; and if the woman does not die, the blood and the contents of the sac are absorbed by the peritoneum. In secondary ruptures, the conception cannot continue to develop in the peritoneal cavity if the villous or the placental attachments are entirely separated. But, if these attach-

ments to the tube, or to the folds of the broad ligament, are not separated, the conception may continue, and the placenta may extend its attachments to any structures which it is possible for it to reach —the uterus, intestines, omentum, bladder, etc. This briefly expresses the whole truth, and so simplifies matters that it is not logical to draw any other conclusion. I do not remember to have seen that any one has before called attention to the fact that fixation of an impregnated ovule cannot occur unless it be held in one place long enough for such attachments to form. An additional proof of this fact is observed in placenta previa, when the uterine walls fail to hold the impregnated ovule near the fundus of the uterus; it is finally caught and held in the mucous folds at or near the internal os uteri, and becomes fixed at the lower segment of the uterus.

I am in perfect accord with Mr. Tait in his views of the relation ectopic pregnancy sustains to extra-peritoneal or to intra-peritoneal hematocele. But I do not believe he is correct in saying that interstitial pregnancy always ruptures into the peritoneal cavity. "Maschka (*Wien. med. Wochenschrift*, 1885) has proved by a post-mortem examination that the cyst in interstitial pregnancy may rupture into the uterus. A woman, twenty-nine years old, died suddenly, and criminal abortion being suspected, a judicial autopsy was made and an interstitial pregnancy with rupture into the uterus was found. The body of the fetus had passed into the uterus and had been removed, but the head was torn from the body and remained in the sac."

In the *American Journal of Obstetrics*, 1887, page 536, Dr. Parkes, of Chicago, reports a case of ectopic pregnancy that he believed was interstitial, which was discharged from the sac into the uterus. I will briefly report a case that came under my immediate observation in the fall and winter of 1873, in which I feel sure an interstitial pregnancy ruptured into the uterus, and the woman recovered. Mr. Tait may object to the introduction of this case because the woman got well and no post-mortem could be held to verify the correctness of the diagnosis; but an assumption that no case of ectopic pregnancy in which we are unable to avail ourselves of the objective facts as seen in an autopsy, or in an abdominal section, can be relied upon, is not logical, for in careful physical examinations we may learn facts of great value in solving problems otherwise not understood.

I was called in the late fall of 1873 to see Mrs. C., an Irish woman, aged twenty-seven; she had not menstruated for three months, and had all the subjective symptoms of pregnancy. With the exception of some sharp pains in the right inguinal region low down, and pains in the lower part of the back, she had no untoward symptoms until the day before I saw her. She then began to suffer severe pains in the right iliac region and had considerable uterine hemorrhage. She became partly unconscious for a while; as pain and bleeding continued, I suspected that she was threatened with abortion,and kept her in bed under the influence of an opiate. She continued to bleed and suffered enough pain to require the occasional use of the opiate. In a careful physical examination I found the uterus enlarged, but a greater enlargement was observed toward the right ovarian region, connected with the uterus. She had but little fever, but continued to suffer and lose blood. As she did not improve, and had no one to care for her properly at home, I sent her to St. Joseph's Infirmary, where I saw her frequently during her illness. The enlargement in the right ovarian region did not appear to increase, but at the end of the fourth month the uterus began to enlarge rapidly, and in another month it was as large as the gravid uterus at term. About this time she again suffered severe pains, when more than a quart of clotted blood was expelled, which caused a marked decrease in the size of the uterus and abdomen. In a few days the enlargement returned, and another hemorrhage was followed by a corresponding decrease in size of the uterus and abdomen. This occurred nearly every week for several weeks. Finally, I was called in haste and found her suffering severe uterine contractions with a large mass protruding from the uterus into the vagina. In a little while, more than a gallon of hydatiform growths was expelled and the uterus contracted to less than its usual size after labor, but there remained an enlargement connected with its right cornua in the site of the original tumor. The next day local peritonitis developed in this region and increased the size of the tumor until it was as large as a goose's egg. Her pulse grew rapid and her temperature was 103° to 104° for a week. She then began to improve and was able to leave the Infirmary in two months, but the tumor did not entirely disappear for many months afterward.

The late Professor John E. Crowe was associated with me in the

case, and we fully concurred in the diagnosis, but neither of us came to any positive conclusion until after the expulsion of the hydatiform growths. She narrowly escaped with her life from the peritonitis, and we did not think for several days that she would recover. She became pregnant two years afterward and gave birth to twins, and three years later gave birth to another child. I examined her carefully a few days ago and could detect nothing abnormal in the pelvis except a completely retroverted uterus, and decided tenderness when I pressed in the region of the right ovary and tube.

The hydatiform growths prove that this woman was pregnant; and if it were in the uterus then, Why the primary and secondary enlargement to the right of the uterus and the localized peritonitis? How can we explain all the symptoms? Her uterus is now normal in shape internally and externally.

I must adhere to the generally accepted belief that the spermatozoa come in contact with the ovule in the outer part of the tube, or probably before it enters the tube, and that the fructified ovule passes slowly through the tube to the uterine cavity. All the facts that we know in relation to generation favor this view, and I know of no logical argument against it. Mr. Tait's *belief* that the spermatozoa cannot pass out through the Fallopian tubes unless disease has destroyed the ciliated epithelium, is based upon no tangible evidence, and is contrary to all that is known upon this subject. It is positively known that the spermatozoa pass out through the tubes upon the ovaries and into the abdominal cavity in the lower animals. While these tubes are not identical in shape, etc., with the Fallopian tubes of the woman, they serve the same purpose and are lined with ciliated epithelium, which sustains the same relations to the movements of the spermatozoa that exist in the Fallopian tubes of the woman. It is doubtless true that desquamative salpingitis is a frequent cause of ectopic pregnancy, but it is because of the obstruction offered to the passage of the impregnated ovule. This character of tubal disease would not facilitate but would obstruct the passage of the spermatozoa, just as it does the impregnated ovule.

It is a well-known fact that the spermatozoa move by an inherent force at a rate variously estimated. Henle concludes that they move one inch in seven and a half minutes, and Sims that they move their length in one second. Nor are their movements easily

interfered with, for Robin has observed that they push out of their way epithelial cells or crystals ten times their size; so why should they not overcome any *possible* obstruction caused by the cilia of the tubes? The impregnated ovule passes slowly through the tubes—in the bitch it does not reach the uterus for eight or nine days, and in the guinea-pig for three or four days. Playfair and other distinguished authorities claim that in the human female the ovum has never been found in the uterine cavity before the tenth day after impregnation. The uterine mucous membrane becomes succulent and thickened during the passage of the fecundated ovule through the tube, so as to prepare a proper nidus upon which it may rest and from which it may be nourished. If this did not occur in woman, the ovule would often fail to become attached at the upper segment of the uterus and would pass down to the internal os, or out of the uterine cavity. The inherent power of the spermatozoa to reach the ovule is made manifest in those cases where women have become pregnant with an almost imperforate hymen, or with atresia vaginæ so nearly complete that there was only a very small fistulous tract leading to the uterus; or in that very remarkable instance where the spermatozoa reached the uterus through the bladder, having to pass through the urine.

Koeberle reports a case "where the uterus had been amputated two years before for fibroid tumor, but a fistula was present in the cicatrix of the cervix through which spermatozoa passed into the abdominal cavity, and pregnancy resulted." The tube may be entirely closed and the ovule may become impregnated by spermatozoa from the other tube. "Leopold tied the right Fallopian tube in rabbits in two places and exsected a portion of the tube between the ligatures; the left ovary was carefully removed and the abdominal wound was closed. After recovery the rabbits were put to the male. In two such cases pregnancy followed." (*Arch. f. Gynäk.*, vol. xvi. page 24.)

The ovule is short-lived, and if not vivified in the tube by contact with the male element degenerative changes will destroy its vitality before it reaches the uterus. Charpentier and other recognized observers claim that after it passes the outer third of the tube, it is covered by a layer of albumen which the spermatozoa cannot pierce. Many other facts could be given to prove that impregnation does not occur in the uterus.

I wish to inveigh earnestly against electricity, or any other means used to destroy the life of an ectopic gestation, for I believe such treatment harmful, if we have made a correct diagnosis, which is nearly impossible until after the rupture of the sac. I put little confidence in the reported successes by the use of electricity, for I am convinced that in nearly every instance there was an error in diagnosis, and that the women were not pregnant.

Abdominal section and the removal of the fetus and sac is the correct treatment, and the experience of Mr. Tait has proven that it is the most successful method of treatment.

In conclusion, I wish to impress upon the Fellows the fact that it has not been my purpose to criticise Mr. Tait; his work in ectopic gestation, if he had done nothing else, would entitle him to the lasting praise of not only the members of the medical profession, but of every enlightened man and woman. His kind heart has probably caused him sometimes to do things that he afterward had cause to regret, and to accept conclusions of some one in whose judgment and powers of observation he had too much confidence. I will mention two instances. He accepts as a demonstrative *truth* that "desquamative salpingitis could at once put the mucous lining of the tube into a condition exactly similar to that of the uterus." This is a physical impossibility, for these membranes are so dissimilar anatomically and histologically that they can no more be made identical in structure, than can the skin and the mucous membrane of the stomach. This I assert without fear of contradiction, and the investigations of men learned in anatomy, histology, pathology, and microscopy will positively demonstrate its truth. It must be remembered that there are but few observers whose statements upon such subjects as this can be accepted without reservation. The similarity could go but little, if any, further than in the total destruction of the ciliated epithelium lining the tube and the endometrium. He again accepts as a fact the discovery by one of his assistants, "Of a large nerve-trunk entering or leaving the cornua of the uterus at the angle between the round ligament and the tube." The gentleman who claims to have made this discovery was doubtless honest in his belief, but his powers of observation were defective, and he probably mistook something else for *a large nerve*. It is no longer a disputed fact that the uterus in all its parts is well supplied with nerves, and that the

tubes, ovaries, and upper part of the uterus are in part supplied from the spermatic plexus, which is probably derived from the renal plexus and the upper aortic plexus; but there is no nerve of any magnitude that has not previously been discovered, by some one of the many well-trained and learned observers who have so patiently and carefully worked in this field. If we will examine the illustration of Frankenhaeuser, 1867, showing the ganglionic and nerve supply and distribution to the uterus, we will see how neatly he traces a *nerve-trunk* formed by the uterine and ovarian nerves, to the cornua of the uterus at the angle between the round ligament and the tube. The nerves of the uterus and ovaries are also made conspicuous in the illustration of De Graaf, 1678.

V. A CRITIQUE OF ITS MANAGEMENT.

By J. M. BALDY, M.D.,
PHILADELPHIA, PA.

I AM glad to take the floor and discuss this exceedingly interesting and important subject of extra-uterine pregnancy, because it will enable me to express views that I have not heard advocated here as yet. My remarks will be confined to that variety of the disease which is known as tubal pregnancy, and in this connection I shall only dwell on two points, viz., diagnosis and treatment. As to the pathology of this disease, some of what has been said I can accept, but much of it I cannot endorse. I accept almost *in toto* the teachings of Mr. Tait on this subject.

The diagnosis I consider beyond the reach of man, and never expect to see the time when it can be made with certainty and accuracy. One may see a patient suffering with all the symptoms that have been put down as diagnostic of the disease, and yet it may turn out to be something else. Such a case has passed under my own observation. The woman had missed her menses for one or two periods; her breasts were swollen, contained milk, and presented the other characteristic symptoms; her abdomen was slightly swollen, and she had vomited a number of times; she had vesical irritation and constipation; characteristic colicky pains were present and she had passed "something" from the vagina, which, from her description, was considered decidual membrane. Vaginal examination revealed a mass about the size of a small orange to the right of the cervix uteri. An operation two days later disclosed an ovarian cyst.

It may be contended that such a mistake is not likely to occur in careful hands. Surely no one would pretend that Dr. Mann, of Buffalo, could not make the diagnosis, if it could be made at all; and yet Dr. Mann did diagnosticate a case as one of extra-uterine pregnancy and suppositively destroyed the fetus by electricity. That same case, a short while afterward, fell into the hands of Dr.

Wylie, of New York, who operated and found a large purulent sac, containing a pint or more of fluid, but nowhere any trace of an extra-uterine pregnancy ever having been present. I think the advocates of the electrical treatment are not exactly honest in not reporting such cases, and I have no doubt that there are plenty like this one. Certainly there have been and will be plenty like mine.

There are only two methods of treatment worthy of any consideration, viz., that by electricity, and that by abdominal section. After rupture has taken place all are agreed that abdominal section is the only thing to be done.

Before rupture has taken place most of our American surgeons, I am sorry to say, advocate the treatment by electricity. Electricity will, beyond doubt, kill the fetus and thus save the patient from all the worry and excitement of a surgical operation. However, after the fetus is dead a diseased mass is left behind. Lusk has reported two cases in which the mass was still present for four and six years afterward, and there are others on record. Now this mass is just as likely to take on active inflammatory action as any other pelvic mass, and a woman with such a disease remaining is very liable to have later trouble, and eventually come to the knife. I consider it the height of folly to operate on inflammatory disease of the appendages and leave such a condition as this. These sacs have been known to ulcerate their way out, and quite a number of such cases are on record. Again, after the operation a vessel has been known to burst and the patient thereby lost. Mann says these accidents have happened so seldom that they need not be taken into consideration. But what sane man would not take accidents into consideration when they have occurred in two or three per cent. of all the cases reported? This matter is too serious to be thrown aside in that manner. Electricity leaves the woman in as much a mutilated condition as if the tube had been removed. This is not all the objection to this treatment, for we have some immediate dangers we must contend with. Dr. Janvrin lost a case, a few hours after having killed the fetus, from a rupture of a vessel in the cyst wall. I have seen electricity passed through a cyst not extra-uterine and the patient became worse after each application.

With all these objections arrayed against electricity we find nothing against the knife, excepting that it is a surgical operation. No case

of death has ever been reported as due to the knife. If a mistake in diagnosis has been made no harm has been done, as the disease, whatever it is, will require the knife at any rate. The operation is no harder than the removal of pus-tubes or inflamed tubes, and the statement which has been made that we have no Martins or Taits in this country is a gross insult to American surgeons; there are probably twenty men here present who are competent to deal surgically with an extra-uterine pregnancy.

I can only end by stating, as I have before done, that I consider that while playing with electricity in this disease, we are running much the same risk that the proverbial child did when it played with fire.

VI. THE TECHNIQUE OF THE OPERATION.

By JOHN B. DEAVER, M.D.,
PHILADELPHIA.

Before a body of distinguished gynecologists a general surgeon might feel out of place in discussing a subject which has been heretofore considered foreign to his mission; but as extra-uterine pregnancy calls for the treatment of a foreign body within the abdomen, and, especially when the sac has ruptured, for the treatment of hemorrhage within the abdominal cavity, I feel that every surgeon should be alive to his sense of responsibility, and to the demands made on him by his patients who may require his services for the treatment of this unfortunate condition; or, perhaps, by his fellow practitioner who may call on him for assistance. Therefore, he should be prepared to do the necessary operation with dispatch, and meet with the many complications that so often arise in abdominal and pelvic surgery.

In considering the technique of the operation let me speak, *first*, of the length of the incision that should be made and the size of the same. The linea alba offers the best point through which to make our incision, it giving us like command of either side of the interior of the pelvis. Here the abdominal walls are thinnest and fewer bloodvessels call for division, than if we selected a point elsewhere than through either semilunar line. The length of the incision should not be greater than is necessary for the introduction of the index and middle fingers of the more educated of the two hands, and for the easy manipulation of them when inserted into the pelvis. Through an incision of this size, in the event that we are dealing with hemorrhage, we are able to remove the blood-clots and find our way to the uterine appendage, the seat of the trouble, and determine the further manipulation necessary to inspect it. By such an incision there is less exposure of the contents of the abdomen and less likelihood of the escape of the intestines and great omentum—a

very important precaution, I consider, to be observed. Through an incision of this size we are able to bring the diseased tube to the bottom of the wound and, if necessary, to inspect it. Again, it gives us ample room through which to irrigate, an equally important point to be observed in nearly all abdominal and pelvic operations. If we are dealing with an extra-uterine pregnancy of some months' standing, and the original incision is too small, it is a very simple matter to enlarge it and thereby give us as much room as had the incision been originally a long one.

Second, having reached the interior of the pelvis and found our way to the site of the trouble, in the event that it is a ruptured sac with which we have to deal, it is important to deliver it and tie it off as soon as possible, thereby lessening the amount of shock which would result from prolonged manipulation. When there are few, if any, adhesions, it is a simple procedure, the difficulties of the operation, therefore, being increased in proportion to the number, the position, and the strength of the adhesions met with. In dealing with an adherent mass, we should first survey the interior of the pelvis at the point where the enucleation is to be made, bearing in mind the position the small intestine and the sigmoid flexure of the colon hold to it, also the ureters and the bloodvessels of the pelvis.

To gain access to the cavity of the pelvis, after the abdominal walls have been divided, it may be necessary either to dissect up the great omentum, which is sometimes found adherent to the fundus of the uterus, or to break through it; in which event, after the enucleation is completed, the abdominal cavity thoroughly irrigated and the drainage-tube introduced, any remaining rent in the great omentum should be brought and maintained in apposition by a continuous catgut suture, the object being to prevent any likelihood of an acute strangulation of the small intestine, from a nuckle of the same becoming engaged therein. Having reached the fundus of the uterus the fingers are to be passed down to the floor of the pelvis behind the mass, their dorsal surfaces looking into the hollow of the sacrum. In performing the enucleation the points of the fingers are to be kept close to the mass, when its connections with the surrounding parts are to be severed in the direction of from below upward, and at the farthest point from the important surrounding structures. The small vessels supplying these adhesions will bleed

but little owing to the character of the manipulation by which they have been separated. By dealing with the mass first from below, and severing its connections there, we are able to lift it up, bringing it to the bottom of the womb, it resting upon the palmar surface of the fingers, and in the event of there being strong intestinal adhesions we are additionally guided in their separation by being able to see them by their having been made more accessible, when, if necessary, they can be surrounded by two ligatures and severed.

When we meet with an adherent vermiform appendix, unless the patient's condition is very bad and contraindicates undue or prolonged manipulation, I think it well to tie off and cut away the appendix, it being, as we know, a useless organ and one capable of serious trouble. Were we so unfortunate as to tear either iliac vein it should be tied both above and below the opening made in it, this being much safer than to attempt to ligate it laterally. Should we have a portion of gangrenous bowel to deal with, resection or the formation of a temporary artificial anus, which can subsequently be closed, would be the treatment. In the event of tearing the ureter and having discovered it, the proximal end of the ureter could be stitched in the abdominal wound, making a urinary fistula; but a safer procedure would be to do a median nephrectomy. If the condition of a portion of the great omentum is questionable, I unhesitatingly state that, in my experience, it is far better to ligate it and remove the doubtful portion than to return it with the hope that it may recover itself; this I have had demonstrated in operations for strangulated hernia.

Third, irrigation. In all cases of abdominal section for intra-abdominal hemorrhage, where there has been escape of the contents of a cyst into the abdomen and where adhesions have been separated, the abdomen should always be most thoroughly washed out. In fact, in all cases of section where the indications do not seem to call for irrigation, yet if there is any doubt in the mind of the operator as to whether or not he should wash out the cavity, I should say that it was safer to err upon the side of safety and irrigate. This, irrespective of the removal of all foreign matter and leaving the parts in a perfectly aseptic condition, in depressed conditions acts as a stimulant by exciting the sympathetic nerves, with which it is brought into close contact, by being introduced into the abdominal cavity, where the greatest number of

branches of this system of nerves are distributed; while in cases where there has been much leakage from the skin, an evidence of profound shock, it acts in a two-fold manner by filling up the depleted bloodvessels and by stimulation.

The *rationale* of the use of hot distilled water in the abdominal cavity to my mind is so logical, that I use it extensively in other than abdominal sections, particularly after the operation for the relief of a strangulated hernia, where there is always much depression; here I always open the sac, thereby giving me access to the cavity. In cases where I have had to make a large incision in the abdominal walls, I flush the cavity by pouring the water into it directly from the basin; this I have done after the operation of ovariotomy complicating a six months pregnancy, without provoking abortion, where I had to deal with a multilocular cyst filled with colloid matter, and where the adhesions were universal and the wall of the cyst so friable as to prevent its giving away.

Fourth, drainage. In all cases of section for hemorrhage or where much bleeding has occurred while doing the section, where there has been escape of pus or other septic matter into the peritoneal cavity, there should be no hesitation about the case being a proper one for drainage. In fact, my experience has been that cases where a drainage-tube has been inserted have proved less complicated after the operation, than in cases where it has not been used.

VII. ITS MANAGEMENT WHEN THE FETUS SURVIVES TUBAL RUPTURE AND GOES ON TO THE PERIOD OF VIABILITY.

By L. S. McMURTRY, M.D.,
DANVILLE, KY.

The subject of ectopic gestation deserves very careful discussion on account of its interest and importance, and from the fact that recent advances in pelvic surgery have recast the pathology of this condition and remodelled its treatment. I accept unequivocally the teachings of Lawson Tait upon this subject, since they throw light where all was darkness, and bring order out of confusion and conjecture. The essential points in the pathology have been concisely stated by Dr. J. Price, and are confirmed by the rapidly accumulating data of pathologists and operating surgeons.

The important points are these: *First.* All cases of ectopic pregnancy are in the beginning tubal. *Second.* When rupture occurs, the ovum may pass into the intra-ligamentous cellular space or into the peritoneal cavity—the intra-peritoneal being a deadly accident, and the intra-ligamentous favoring the growth and development of the fetus. As to diagnosis, I believe it altogether impracticable before the period of rupture. I am sceptical in regard to all claims of diagnosis previous to that time. Indeed, if I were to witness the confirmation of such a so-called diagnosis I would consider it only a happy guess. This insurmountable difficulty in diagnosis—a difficulty enhanced by the fact that the patient rarely requires or seeks aid from the physician previous to rupture of the tube—must necessarily impair confidence in the results claimed for treatment by electricity in the early weeks of ectopic pregnancy. When the diagnosis is made, which will, as a rule, be at the time of rupture, abdominal section, removal of fetal tissues, and cleansing away extravasated blood, constitute the only treatment worthy of confidence. This procedure is thoroughly surgical, and if done promptly and skilfully the result is satisfactory in every respect.

But, Mr. President, I desire to address my remarks in this discussion, more particularly, to the management of extra-uterine pregnancy when the fetus survives tubal rupture and goes on to the period of viability. Six months ago I operated in a case in which the child had perished after the period of false labor. This occurred one month before I saw the patient. The operation was necessitated by the appearance of septic symptoms. On opening the abdomen I found the child loose, without a trace of the sac. The liquor amnii had been absorbed and the child was undergoing decomposition. The placenta formed a large mass attached to the uterus, bowel, and floor of the pelvis. The cord was shrivelled, and in examining the placenta I started a hemorrhage which compelled me quickly to remove that mass. By sponge-packing and forceps-pressure I arrested the hemorrhage, put in a drainage-tube, and closed the abdomen. My patient never fully reacted and died the following day. The cord was shrivelled and the placenta gave no evidence of active circulation.

Just how to deal with the placenta is the great problem in these cases. The popular plan seems to be to stitch the sac to the edges of the incision, to leave the placenta untouched, and to place a drainage-tube at the site of the placenta with the cord hanging from the lower angle of the wound. During the long process of suppuration and discharge of placental débris the patient is exposed to the perils of sepsis. In such a case, in the hands of one of our Fellows, death occurred from hemorrhage during separation of the placenta two weeks after the operation. Thornton has reported a successful case in which he removed the entire gestation sac. Martin had a successful case at full term with living child, in which he removed the placenta. Some operators have endeavored to quilt around the placenta with the cobbler's stitch and thereby arrest hemorrhage; others have tried to tie the vessels feeding the placenta. Unfortunately, there is no way to ascertain beforehand that the placental circulation has ceased. Schroeder found in one case obliteration of the vessels three weeks after death of the fetus, while Depaul lost his patient from placental hemorrhage four months after the death of the fetus. The truth is, that no hard and fast rules can be laid down for deciding the management of these cases, since no two cases are alike. After my own experience I would prefer to leave the placenta untouched, unless its arrangement is such that it can

be securely clamped or tied away. Mr. Tait suggests that the sac be thoroughly cleansed after removing the fetus, and, while filled with water, to stitch the incision in the sac so as to close it tightly as the water is removed, thereby closing it hermetically; then to close the abdomen and leave the sac and placenta to atrophy and absorption.

One other point of great importance presses for consideration. When a case of ectopic gestation has advanced near or quite to full term shall we await the death of the child and the approach of sepsis before operating; or shall we, at the advent of spurious labor, open the abdomen and attempt to save both mother and child? Harris has collected thirty cases operated upon after the period of viability, with the result of only five women and twenty-two children saved, a number of the children dying within short periods after birth. It must be remembered that nearly all of these cases occurred before the days of modern abdominal surgery, and hence cannot properly be either a guide or a hindrance to future action. Mr. Tait has performed three operations at this period, with the splendid result of "one death of a mother and no deaths of the children." Several successful operations have likewise been done in our own country, and it is quite safe to predict that they will become more numerous.

VIII. ITS TREATMENT (*concluded*).

By A. VANDER VEER, M.D.,
ALBANY, N. Y.

Many eminent writers and operators in the field of abdominal surgery have paid especial tribute to the worth of Sir Spencer Wells's monograph on abdominal tumors, published in 1865. The particular excellence of this work lies in the full, clear history of cases, the concise yet minute description of the surgical devices employed in overcoming obstacles and bringing his cases to a successful termination.

Much of the literature upon ectopic gestation, especially that which deals with the subject before rupture and hemorrhage, as to histories, points of diagnosis, and the details of treatment, is very vague. The busy writer is often prone to pass rapidly over the history, symptoms, and general manner of treatment, to enter some special pleading for this or that form of treatment.

The abdominal surgeon will often be called in consultation by the general practitioner when a suspicion of ectopic gestation may arise. It will be necessary for him to have in mind the various points of diagnosis, especially of early diagnosis—that is, some time prior to the sixteenth week.

I believe there are, on the one hand, a class of cases in which a diagnosis can be made before rupture and by the tenth week. On the other hand, there are cases which do not give rise to any symptoms other than those of a normal pregnancy before the rupture takes place; witness the thirty-five cases of Tait, the eighteen cases found post-mortem within a very short period by Dr. H. F. Formad, of Philadelphia, and numerous other cases in literature, as well as many, I dare say, buried without a diagnosis having been made. In Formad's cases no examinations had been made; the pain and collapse had been attributed to colic or cramps. The deaths all occurred in laboring women and before the twelfth week.

The first class of cases are such patients as have been under the eye of the gynecologist perhaps for years, and have been treated for some form or other of pelvic disease. He will therefore be conversant with the pelvic conditions and relations, the presence or absence of new growths, the condition of the periuterine connective tissue, the broad ligaments, the tubes and ovaries, as well as the position of the uterus. In such cases there will be the onset of menstrual disorders altogether new or different from those heretofore experienced; severe and recurrent attacks of pelvic pain; mammary and gastric disturbances; perhaps the expulsion of shreds of membrane with the clots; dysuria—any or all of these symptoms may bring the patient to him. When to these symptoms, upon examination, the vaginal hue (the so-called wine cast), which I believe to be valuable in a goodly per cent. of cases as early as the second month (Chadwick), is present, the uterus displaced either laterally or forward, the cervix softer, the os more patulous, the uterus enlarged, and finally a new growth, behind or to the side of the uterus, globular, semi-fluctuant to the touch—a strong presumption of ectopic gestation exists. If, after another examination, the pelvic conditions are aggravated by the rapid increase of the tumor, or, as in many cases, fresh decidual shreds are expelled, it seems to me that we are quite as sure of our diagnosis as when we have decided an abdominal tumor to be ovarian.

The literature of ectopic gestation is not without a goodly number of histories with symptoms subjective and objective as clearly defined as already mentioned. We have made our diagnosis. How and when shall we treat our cases?

For convenience' sake the treatment may be relatively divided into three classes: *First*, cases diagnosticated before the fourth month; *second*, cases between the fourth month and term; *third*, cases after term and spurious labor.

Among obstetrical and gynecological writers there is no great difference of opinion relative to the manner of treatment of the second and third classes, and even some of the first class of cases. As I understand it, the general consensus of opinion of those who advocate the use of electricity is that it is not applicable after the fourth month, or after rupture and hemorrhage *whenever* they occur. Aside from abdominal section and electricity, no method of treatment has any considerable number of advocates.

The use of electricity as a feticidal agent is largely an American method of treatment. Aveling claims the first successful case in England, in the *British Gynecological Journal* for May, 1888. It has gained no considerable foothold in England and has no advocates on the continent. In America there have been reported forty cases with one death, and that from hemorrhage following an application. In nearly all of the cases, from reading the histories, there can be little doubt of the diagnosis. The treatment was instituted at periods varying from the end of the second month to the end of the fifth. One case in which the fetus was afterward discharged by ulceration into the vagina (Chadwick's) was approximately at the one hundred and fifty-third day of gestation. The advocates of electricity are very generally agreed that treatment by electricity should not be instituted after the fourth month. The galvanic and faradic currents have both been used with equally good results. However, the majority, I think, prefer the faradic current. Apostoli, one year ago, recommended the use of galvano-puncture. In reply to a question asked, he said that he had no personal experience with it. Galvano-puncture of the sac has been an unusually fatal procedure. I know of but one successful case.

Objections have been urged against electricity as a feticidal agent —that it is an immediately dangerous operation, that the diagnosis has not always been established beyond reasonable doubt, that the placenta continues to grow after the death of the fetus, that the method often fails, and that the after-histories of many of the cases have been serious ones. It seems to me that there are not enough data yet collected either to refute or confirm these objections. However, it seems to have been followed by no immediately serious results save in one case. The objection that the diagnosis has not always been clear doubtless has considerable weight in a few of the cases, yet the question may be seriously asked, With the present mortality following exploratory incisions in America, are we justified in doing laparatomy in similar cases? In none of the cases yet treated by electricity has the placenta been shown to have grown after the death of the fetus. I think the placenta of an ectopic gestation does not resemble in size, weight, or outline that of a normal one—Thomas's case, for example. That the method fails has been demonstrated by Price and others. The objection that untoward results follow the operation seems to have a better ground than

many others. Surely many of the cases treated by electricity have not been followed by absorption of the ovulum or product. One case already cited was followed by septicemia with the discharge of the contents of the sac through the vagina. (Chadwick's case, afterward treated by Dr. Murphy, of Washington.) The convalescence in this case was tedious. There are several cases in which, after months, considerable thickening of the broad ligaments remained, and in a few the fetal sac did not materially decrease in size (*e. g.*, Reeve's case). Manifestly, an unabsorbed product of ectopic gestation is not a desirable mass to have located in the pelvis, by its presence producing uterine displacements with all of their attending symptoms, or being a seat of chronic irritation ready at any moment, under favoring circumstances, to be lighted up into an active inflammation. Again, a tube once the seat of an ectopic gestation can never afterward be of any functional use.

The operation for the removal of the product of an ectopic gestation by abdominal section before rupture has taken place, or before the expiration of the fourth month, ought not to be more serious than the removal of the tubes and ovaries. Veit records seven successful cases with no failures. If the operation can be done without increased danger to the mother, it should be done, and that, too, at the earliest possible date after the diagnosis has been made. It is to the surgeon an ideal method. There remains no foreign body to be disposed of and no serious after-effects to be feared. This method, I am sure, is receiving no little attention in this country, and is the recognized procedure in Germany. Dr. A. Martin, after commenting on the after-histories of cases treated by electricity "as running on a slow course," said we have agreed (*Proc. Brit. Gynec. Soc.*, 1886) to operate at once in our tubal cases. Waiting in any case for rupture is dangerous. Twenty-five per cent. of the cases after rupture die before an operation can be done. It is to be hoped that sufficient experience will soon be collected to show the relative value of electricity and abdominal section, in the treatment of early ectopic gestation.

When in a case there arise the symptoms of shock, and internal hemorrhage occurring, as shown in the case reported by Dr. Henry Hun, in the *Amer. Journ. of the Med. Sciences,* July, 1884 (and a few reprints I here present, as the paper is a very complete one in many respects), then it will be seen the achievements of Mr. Tait clearly

point out to us our duty. He has done more than all others to give to the world a great life-saving operation. There can be no doubt that an immediate abdominal section is the only proper thing to do; ligating the broad ligaments, removing the tube with the product of conception, and cleansing the abdominal cavity. If a case of ectopic gestation goes safely beyond the fourth month the dangers of rupture become very small. The general tendency of operators is to leave the cases alone until the onset of spurious labor, if the fetus be living. Then comes the question of whether we shall try to remove a living child, or wait until after the child is dead and the placental circulation has ceased. The first method has been most disastrous in the past as regards the safety of the mother. Harris collected twenty-five cases, with twenty-three deaths. However, the same author has examined ten cases occurring since 1881, in which the operation was done after the fetus became viable. There were four recoveries and six deaths. Five children lived, or their deaths were attributable to natural causes. Mr. Tait reports seven cases with six recoveries. The tendency of operators is growing more and more toward primary laparatomy even at the increased risk of mothers.

After spurious labor and the death of the fetus, the onset of suppuration makes abdominal section imperative. If the fetus is quiescent, operation, although advisable, is not urgent (Greig Smith). It is better to wait until absorption of the amnion indicates that the placental circulation has ceased.

The following cases coming under my observation I report briefly:

Mrs. V., the wife of one of our most prominent physicians, became pregnant a few years after marriage. In time it was recognized as a tubal pregnancy. She suffered nearly twenty years previous to her death with constantly recurring pelvic abscesses, discharging through vagina and rectum, and accompanied with portions of the fetus. No operation attempted.

Mrs. B., young, happily married, and with the brightest prospects in life. She became pregnant; suffered much. I am not sure whether a diagnosis of extra-uterine pregnancy was made, but after spurious labor and when septic symptoms presented, I was consulted; but another surgeon was called to perform abdominal section for reasons I cannot now explain. The sac was found, a suppurating

fetus removed, the cavity washed and drained, but the patient lived only a few hours.

Mrs. B. married in 1871 and became pregnant in 1874. At the time of each monthly period afterward she had a thin, pinkish discharge from the vagina. In November, 1874, she had severe abdominal pains and a watery discharge from the uterus. A physician was called who declared her to be in the seventh month of pregnancy. She was ill for some time after this and confined to her bed for five or six months. Slowly regained her usual health and the natural monthly flow returned, but she did not change much if any in her size or form. In 1877 she became pregnant, and at the seventh month was delivered of a dead child. In July, 1879, after severe effort, she felt something give way in her abdomen which was followed by a slimy discharge from the rectum for three days, and then by profuse yellow pus. Periodic discharges of this nature continued up to February, 1881. Dr. Newcombe states that he made an examination, and then discovered fetal bones protruding into the rectum about three inches above the external sphincter. Several attempts were made by him during a period of two weeks, when he finally succeeded in reaching the mouth of the sac, enlarged its opening and, with the aid of forceps, removed the fetal bones, which are here presented. The smaller bones were scooped out. Some two or three pieces were embedded in the wall of the sac, but were dislodged by scraping. On the sixth day afterward the sac filled, but opened on the 13th of March, when, by careful washing, the patient was kept in good condition and finally went on to recovery.

When we consider these cases as a class carefully, and think of their intense sufferings, anxiety of friends, and their small hope of ultimate recovery, it seems to me we are justified in urging, when the diagnosis is clear, primary laparatomy, especially in view of our improved technique in doing the operation.

Finally, allow me to record my belief that in primary laparatomy the placenta ought to be removed either by ligation or by exsection, as in Prof. Aug. Breisky's case. In the four recent successful cases collated by Harris the placenta was removed in three. Tait, who has been so signally successful, removed the placenta.

APPENDIX.

NOTE.—Since the foregoing discussion was held Mr. Tait's lectures on this subject have appeared. For the purpose of making this brochure embrace the latest thought on the question; and, further, to enable those who may not have Mr. Tait's book at hand to form a judgment as to its inestimable value, the following pages are here introduced.

ECTOPIC GESTATION AND PELVIC HEMATOCELE

Considered in the Light of Mr. Tait's Views—being principally a Discussion of These as enunciated in His Lectures on this Subject.[1]

AN EDITORIAL REVIEW.

[From the *Buffalo Medical and Surgical Journal*, March, 1889.]

In the light of his achievements in the surgery of ectopic gestation, no future consideration of this subject can be approached without due acknowledgment of the value of Mr. Tait's contributions toward the clearing up of doubtful questions of this hitherto much discussed, though little understood, *bête noir* of abdominal surgery.

The lectures that are taken as the text of these remarks—chiefly in the nature of a review—are the most important addition to the literature of the subject since the appearance of Bernutz and Goupil's Memoirs. This book, as Mr. Tait most justly remarks, has received by far too little notice, containing, as it does, a basis scientifically correct for the pathological study of aberrant gestation; while, on the other hand, from the point of treatment, it is absolutely of no value whatever, barely suggesting, as it will be found, the possibility of the success of surgical interference. In this connection, it is interesting to note that the passage of the electric current through the fetal sac is suggested by these authors as a vague possibility of benefit. The use of this agent in extra-uterine pregnancy will be referred to further on. Mr. Tait's views as to the pathological changes in the tubes, the retention of the ova thus being made possible when impregnated, though not capable of exact demonstra-

[1] Lectures on Ectopic Pregnancy and Pelvic Hematocele. By Lawson Tait, F. R. C. S. Edin. and Eng., LL.D., Professor of Gynecology in Queen's College, Birmingham, etc.

tion, is at once so plausible and natural that it impresses the careful thinker as perhaps the best possible hypothesis of the first step of this most dread surgical affection in women.

Mr. Tait regards all ectopic pregnancies as primarily tubal, admitting, however, the possibility of an ovarian pregnancy. The time of rupture is placed before the fourteenth week. Bernutz and Goupil extended the period to four months. Mr. Tait's opinion on this point is more likely to be correct. His view of the history of the rupture is as follows:

"It takes two directions (*a*) into the peritoneum, which is the fatal form; and (*b*) into the cavity of the broad ligament, a form which yields the variety of ectopic gestation, which I propose to call the extra-peritoneal, which was called the sous-peritoneo-pelvienne variety by Dezeimeris, and which alone yields all the cases which go on to the period of viability, all the lithopedia, all the suppurating cysts discharging into bladder, rectum, etc., and also the cases which by *secondary rupture of the ovum cyst* get called 'abdominal pregnancy.'"

Mr. Tait first proposed this view of the varieties of ectopic gestation in 1873. Its simplicity, and the logical defence of his position in expounding his theory, render it probable that it will ultimately be accepted by all. Mr. Tait's "genealogical table" of ectopic gestation is as follows:

I.—Ovarian, possible but not yet proved.

II.—Tubal, in free part of tube, is (*a*) contained in tube up to fourteenth week, at or before which time *primary* rupture occurs, and then the progress of gestation is directed into

(*b*) Abdominal or intra-peritoneal gestation uniformly fatal (unless removed by abdominal section), primarily by hemorrhage, secondarily by suppuration of the sac and peritonitis.

(*c*) Broad ligament or extra-peritoneal gestation;

(*d*) may develop in broad ligament to full time and be removed at viable period as living child;

(*e*) may die and be absorbed as extra-peritoneal hematocele;

(*f*) may die and the suppurating ovum may be discharged at or near umbilicus, or through bladder, vagina, or intestinal tract;

(*g*) may remain quiescent as lithopedion;

(*h*) may become abdominal or intra-peritoneal gestation by secondary rupture.

III.—Tubo-uterine or interstitial is contained in part of tube embraced by uterine tissue, and, so far as is known, is uniformly fatal by primary intra-peritoneal rupture (as *b*) before fifth month.

As has already been stated, Mr. Tait does not deny the possibility of ovarian pregnancy, but doubts its probability. All the cases of this variety of pregnancy, save Spiegelberg's, he regards as questionable, or entirely fallacious.

As to the diagnosis of ectopic gestation previous to the period of rupture, Mr. Tait plainly states that nothing positive can be insisted upon. That is to say, that while it may be held and proven by operation that ectopic gestation has existed, still in other cases, where the diagnosis is just as positive with just as strong presumptive evidence, an error in diagnosis will be found to have been made and no ectopic pregnancy exists. This view comes with peculiar force in view of the author's vast experience. He cites one case in which the lesion occured a second time in the same woman, who, in spite of her own previous experience, did not recognize or suspect her condition, and died of hemorrhage from rupture. Than this nothing can be stronger proof that symptoms may count for naught, and that while it is possible to categorize upon the presence of this symptom and that, as a proof of extra-uterine gestation, one or many or all of these symptoms may be absent, and the only presage of the condition will be the rupture. In this connection it is fitting to refer to two sets of cases, almost unique in their persistent claim for record as remarkable diagnoses. As will be seen, the claims of the one treated by electricity are presumptive, proving nothing. Those of the other are presumptuous and pertinacious. The cases referred to are those of Dr. J. G. Allen, of Philadelphia, *American Journal of Obstetrics*, vol. v. p. 161, 1872, and Dr. H. A. Kelly, reported in the the *American Journal of Obstetrics*, Aug. 1886.

The cases of Dr. Allen are frequently referred to, especially in reference to the treatment of this condition by the electric current. It is not our purpose to discuss treatment at this point, but simply to consider diagnosis. In the first of Dr. Allen's cases, something resembling a decidua was passed at about the second month of pregnancy. Later, ballottement gave assurance of the presence of a fetus. The current being passed, the tumor ceased growing and

gradually diminished to the size of a large fist. In Dr. Allen's second case the history is defective. No symptoms were discoverable, and all that is asserted as proven is that the tumor decreased in size after the application of the current. In his third case, which the after-history shows indisputably, by the discharge of the fetal bones, to have been extra-uterine pregnancy, the condition was not even suspected. Nothing abnormal was noticed till after the sixth month. The woman had supposed herself pregnant and engaged Dr. Allen to attend her. "A special examination," by which a tumor could be detected, led him to think it a fibroid growth. Here, then, are three cases considered extra-uterine. One has proven, by its termination, its right to be so maintained. In it, the condition was not even suspected. The other two are, if not suppositious, at least suppositional; and this statement is true of all cases claimed to be extra-uterine fetation on no better evidence than some or many of the symptoms of pregnancy, the subsequent passage of the electric current, and the after-shrinkage of the tumor. Such a history cannot be claimed to be distinctly peculiar to this condition. At best, it is the expression only of a probability. It is not even presumptive evidence. Then, again, shrinkage of the cyst, as a pathognomonic symptom of extra-uterine fetation, would have no value, where diagnosis for operation by the abdominal section might be considered; shrinkage could only occur after the death of the fetus, and as advocates of the electric current desire only to kill it, operation from their standpoint would be a useless procedure. We will refer to this point further on. The case of Dr. Kelly is only worthy of attention as showing how a diagnosis may grow after operation, and points become developed by time as vital, that have no place in the original communication.

The special point since claimed in this case is the shrinkage of the cyst. This step in the diagnosis is absolutely wanting in the original report of the case, and, therefore, is an after-thought, making its addition to a consideration of the subject simply superfluous, and therefore valueless. Nay, more; it is misleading and fallacious, in that it seeks to put up for a positive sign what previously had not been considered, but also loses sight of the fact that as a diagnostic sign, where operation is held under advisal previous to rupture, it is positively of no value whatever. Further, the

remarks of Dr. R. P. Harris, after the presentation of the case, distinctly say:

"The case reported by Dr. Kelly *had as clear a history as we ever find in the very early history of ectopic gestation, when it cannot be claimed that a positive diagnosis can be made.*"

Here is an admission by Harris himself, which we have taken the liberty to italicise, that a claimed positive diagnosis was only a guess, and that on mere presumptive evidence. Further, the passage of a piece of flesh, which the doctor did not see, is taken as a step in the diagnosis. This is in all cases questionable. First, because even in cases of undisputed ectopic gestation, the decidua is frequently, if not always, passed as shreds or *débris*, and attracts no attention whatever. If the membrane, then, is an important point in diagnosis, it must in these cases be wanting, and a decision reached without it. Further, in closing his discussion, Dr. Kelly reported having another "case of extra-uterine fetation on hand now, and is waiting for the death of the fetus, when he will operate." Where is the report of this case? There is certainly none on record.

One other case remains to be noticed, especially in reference to the use of the electric current, after a supposedly correct diagnosis. Dr. Wylie, *American Journal of Obstetrics*, vol. xix. p. 75, reports a "case of hydrosalpinx, diagnosticated as extra-uterine pregnancy."

The case had been first seen by Dr. Mann, of this city, who judged it extra-uterine pregnancy, passed the electric current at intervals for ten days, and sent the patient home. Dr. Wylie operated, as stated above. The question now arises whether many of the so-called early diagnoses, insisted upon by Dr. Thomas, are not merely errors, that are buried by the disappearance of the patient, who subsequently falls into the hands of a less confident diagnostician, which latter more correctly finds her trouble by operation, and removes it without trifling with it. Dr. Thomas says:

"Were I asked to what I attribute the good results obtained in my cases, I should feel forced, in simple candor, to run the risk of the charge of egotism and to reply, 'I attribute it to three influences: first, early and positive diagnosis; second, the prompt resort to destruction of the life of the fetus during the early months (of twelve thus treated all recovered); and third, to an equally prompt resort to surgery in the later."

It is well to remark that what Mr. Tait places first—operation—

Dr. Thomas places last. Mr. Tait insists upon the essential guess-work of early diagnosis, while Dr. Thomas insists upon its certainty. It would be interesting to know in what proportion of cases operated upon the diagnosis was verified, and in what proportion it failed. It is significant that, after the above positive claim for early diagnostic precision, Dr. Thomas should write:

"After all that has been said with regard to the diagnosis of ectopic gestation, it must be added that a positive conclusion is very generally difficult and often impossible."

Why not confess that the diagnosis is, after all, only a suspicion? If Dr. Thomas, with all his experience, writes the above, what must be thought of the claims of those whose diagnostic experience is based upon one or two cases, and who yet urgently, in season and out, herald their unprecedented feat of early diagnosis in this condition? In fact, if not in expression, Dr. Thomas and Mr. Tait are nearer together than, at first sight, would appear.

On the treatment after the rupture of the sac, Mr. Tait is unequivocally decided upon the propriety of operative interference. Dr. Thomas recites one case "trusted to nature," with ultimate recovery. With Mr. Tait's wonderful record, the weight of authority is on the side of early interference after rupture, or before if discovered. On what Dr. Thomas has to say upon the treatment of the sac before rupture, hinges its entire value as regards the question of correct diagnosis. In view of the uncertainty of this, to positive surgeons of the Tait type his dictum will have little weight. With these we believe that in competent hands, in case of doubt, the exploratory incision should be resorted to, and if the diagnosis is verified, the sac should be dealt with surgically, as hereafter to be noticed. The use of the electric current is all the less to be recommended in the light of Mr. Tait's successes. At best it only attempts the killing of the fetus, and can promise nothing more. It remains for the reproach of this treatment, that the sac and its contents still remain, and may at any subsequent period menace the life and safety of the patient. Or, in the most favorable event of suppuration and discharge, the comfort of the patient is for an indefinite period interfered with. The treatment appeals more to the electrical experimentist than to the practical surgeon—more to the trier of novelties than to him who is satisfied with nothing less than tangible results.

Mr. Tait's view that, in most instances, the so-called hematocele is a ruptured extra-uterine cyst, is fully substantiated, both by his investigations and those of Bernutz, to whom he gives especial credit.

Bernutz's classification of the possible varieties of intra-pelvic hemorrhage is worthy at this time of great consideration, and is:

1. Hemorrhage caused by the rupture of dilated utero-ovarian veins. (This kind of hematocele occurring sometimes in extra-uterine pregnancy, may be said to represent one of the varieties of thrombus in normal gestation.)

2. Hemorrhage caused by the rupture of the ovary. (This we see happen in cases of pregnancy, whether the product of conception occupies the uterus or not.)

3. Hemorrhage caused by the rupture of the Fallopian tube.

4. Hemorrhage from the fetal cyst itself having ruptured. (The largest number of cases fall under this last head; both it and the next are of special interest, because they are peculiar to extra-uterine pregnancy, while the three former belong also to intra-uterine pregnancy.)

5. Hemorrhage within the fetal cyst (which may end in death without effusion of blood into the peritoneal cavity, and, therefore, may not produce a real hematocele).

Had these views received the attention they deserve, there would not now be so much conflict of statement concerning the affection, or rather the symptoms they elucidate. Of hematocele due to suppressed menstruation, Bernutz also makes distinct mention. Of this variety Mr. Tait says:

"There are only two causes known to me, one very common and one relatively rare. The first is sudden arrest of metrotaxis, which may be either normal menstruation, or the pseudo-menstruation which occurs so constantly after abdominal operations." . . .

He then goes on to elucidate this condition. The abdominal surgeon, who has not studied or considered it, will here find much information, and with it much comfort concerning a matter which must often have worried and perplexed him. The second cause of extra-peritoneal hematocele is effusion of blood into the broad ligament from ruptured tubal pregnancy of about the twelfth week. Of this Mr. Tait says it is "much more rare and probably much more fatal, certainly much more serious."

The scheme Mr. Tait has given of extra-uterine pregnancy so well speaks for itself, that there is no need of repeating his argument. It is perfectly plain that, if the primary rupture takes place so as to fall within the folds of the broad ligament, the hemorrhage must be limited. It is also perfectly clear that a further secondary rupture may occur into the peritoneal cavity, and will then be almost necessarily fatal, unless by the merest chance.

Mr. Tait, in considering the question of rupture into the broad ligament, clearly shows that no two cases necessarily have the same history. Some terminate quickly by the death of the fetus and rapid absorption, others go on in their development for varying lengths of time, then to die and suppurate, or to remain quiescent as lithopedia. Still others may go on until full development, necessitating surgical interference; while others, as has been shown, rupture, and unless promptly dealt with, in the vast majority of instances, terminate fatally.

Of suppurating cysts, Mr. Tait, after calling attention to their various paths of exit—umbilicus, rectum, vagina, and bladder—thus sums up:

"In all of these the history helps but little, for the story is seldom more than that of obscure pelvic trouble, ending in abscess, bursting and continually discharging into the rectum, and it is not till the arrest of some sharp spicula of fetal bone in the anus declares the true solution, that the nature of the case is discovered. . . . The mortality is doubtless quite what is asserted by Parry, though I never saw a fatal case. All that have come under my own care have been easily cured by the complete emptying of the sac."

Of the fatality of cases opening into the bladder, Mr. Tait agrees with Parry, that they are much more fatal than those opening in the other directions. Mr. Tait has never seen one of these cases in its early stages, but expresses the belief that the correct method of dealing with them is by abdominal section. He says:

"I feel quite confident that if these cases were dealt with by opening from above in their earlier stages much of their mortality would disappear, and the patients would be spared years of suffering. I would treat them as I do pelvic abscesses, and if the peritoneum were opened I should close it in my usual fashion, by stitching the opening in the walls of the cavity of the broad ligament to the opening in the parietal peritoneum, after emptying the decomposing

débris and cleaning out the cavity. I have now done over fifty operations of this nature, and not only has there been no mortality, but the cures have been so rapid, complete, and permanent as to give me perhaps more satisfaction than almost any other class of my work."

For a complete discussion of what Mr. Tait terms the minority of the minority of cases, *i. e.*, where the ovum survives and grows toward full time, the reader must follow minutely the argument of the author. To do it full justice almost a complete reproduction would be necessary. Jessop's remarkable case is cited at length as the only instance of the so-called "abdominal" pregnancy on record. Mr. Tait, rightly we agree, refuses to accept those collected by Parry. The difficulty of diagnosis, in broad-ligament cases approaching maturity, is thoroughly discussed. Conditions conducing to error are: extreme thinness of the uterine walls in normal pregnancy, displacement of the normally pregnant uterus, during the early months of pregnancy, complicated with fibro-myoma or cystic diseases of the uterus, and more rarely pregnancy in one-half of a double uterus. The greatest difficulties in diagnosis are met, according to Mr. Tait's experience, after the death of the child, or, at least, when the time of the expected confinement has passed so long that if there is a child it is sure to be dead. "No history," says Mr. Tait, "however complete, is of sufficient weight to establish a diagnosis, unless there be some distinct physical signs in support of it." Quoting from Campbell's curious work, referred to by Ramsbotham as a "publication full of most valuable facts and deep research," he cites the following passage, showing how little trust can be placed in histories:

"In many instances of the different varieties of misplaced gestation, the catamenia are suspended; frequently, however, they appear regularly in each of the early months; in some cases they flow at uncertain periods; and in other examples they are either profuse or limited in quantity. In many cases, at an uncertain period of gestation, we have hemorrhage, uterine effusions, the extrusion of coagula, of bodies which resemble moles, or portions of placenta. These appearances have occasionally led to the belief that the patient has aborted, so that the ovum was originally not extra- but intra-uterine, and had escaped through a rent in the uterus into the peritoneal cavity, the extruded body in either case being viewed as the placenta.

Cases attended with much uterine excitement, whether arising from unusual exertion or some external injury, are most likely to be accompanied by these latter phenomena."

Two symptoms are regarded by Mr. Tait as invariable in extra-uterine gestation which has gone past the period: a "show" during false labor and a diminution of size after false labor. This opinion is fortified by Parry's authority, which is regarded throughout as especially weighty.

As to the treatment of these extra-uterine fetal cysts, Mr. Tait leaves no doubt or question as to his position. Tapping is condemned as a diagnostic procedure. The author says: "I open the abdomen and make out the condition." The use of the trocar in diagnosis, as shown by Parry, is simply a record of mortality, and cannot be too strongly condemned. The treatment by electricity, at or near full time, in order to kill the child when viable, is condemned by Mr. Tait in the strongest terms, especially as its death does not bring safety to the mother. His own experience has shown that, by operation, both may be saved, and his argument cannot be refuted. The treatment by electricity has been referred to before. Mr. Tait has no place for it. Dr. Buckmaster's case is cited at length. Mr. Tait here clearly has the best of the argument, and sums up his belief as follows:

"It is by no means clear from experience which we have had in this method that the current is without harm, whether the diagnosis be correct or not, and it is equally without proof that it is sufficient to produce the effect desired."

In reply to the assertion that it is sometimes impossible to complete these operations, the following strong statement is made: "The rule ought to be that all such operations should be completed, and any man who has such want of skill and pluck as to stop in the middle of one of them, ought not to attempt them. THEY CAN ALL BE COMPLETED." It may be well to give the author's concluding creed in reference to the operation to save both mother and child:

He says: "I therefore advocate the principle of saving a child who has survived the catastrophe of the primary rupture of the tube by being extruded into the broad ligament. If its existence is recognized during life, the mother ought to be carefully watched till the false labor sets in, just as we watch for a case of puerperal hysterectomy and seize the onset of labor or its early stage as the most

favorable time for both mother and child. From this point of view, therefore, neither the time selected nor the details of the proceeding will be influenced save by two considerations: not to operate before the child is likely to be viable, provided the delay necessary does not prejudice the mother; and not to delay at all after the death of the child. I specially lay this down for the purpose, amongst others, of excluding all operations for the removal of the child by vaginal section." Mr. Tait then goes on to show the utter unjustifiableness of the vaginal section as a surgical procedure, and concludes, "I shall never, under any circumstances whatever, attack a sub-peritoneal pregnancy from the vagina."

Strong expression indeed, but a weaker would be inadequate condemnation of a procedure that has its origin in timidity and its end in failure.

The last portion of the book is devoted to a consideration of the pathological post-mortem researches of Hart and Carter. These are worthy the most careful study. By their frozen sections the peculiar arrangement of the peritoneum in extra-peritoneal ectopic gestation is fully elucidated, showing why, as Mr. Tait holds, the incision for operation should not be made in the middle line, so as to avoid opening the peritoneum. "In fact," he says, "the operation should not be an abdominal section at all, in the strict sense of the definition I have adopted."

As to the method of dealing with the placenta, Mr. Tait's conclusions are:

"I am, therefore, disposed for the present, at least, and until I am corrected by future experience, to advise in dealing with an ectopic gestation in the advanced stages, that we should deal with the fetus only, should empty the placenta of blood, and close the wound hermetically upon it."

The lectures are closed by a reference and tables of the length of time of retention of the fetus, and cases of lithopedion. More than simple reference to these is impossible.

Mr. Tait's tribute to Parry in the beginning of his book, and his continual citation throughout his discussion, is well deserved, generous, and graceful—a respect from the living teacher to the voiceless but speaking dead.

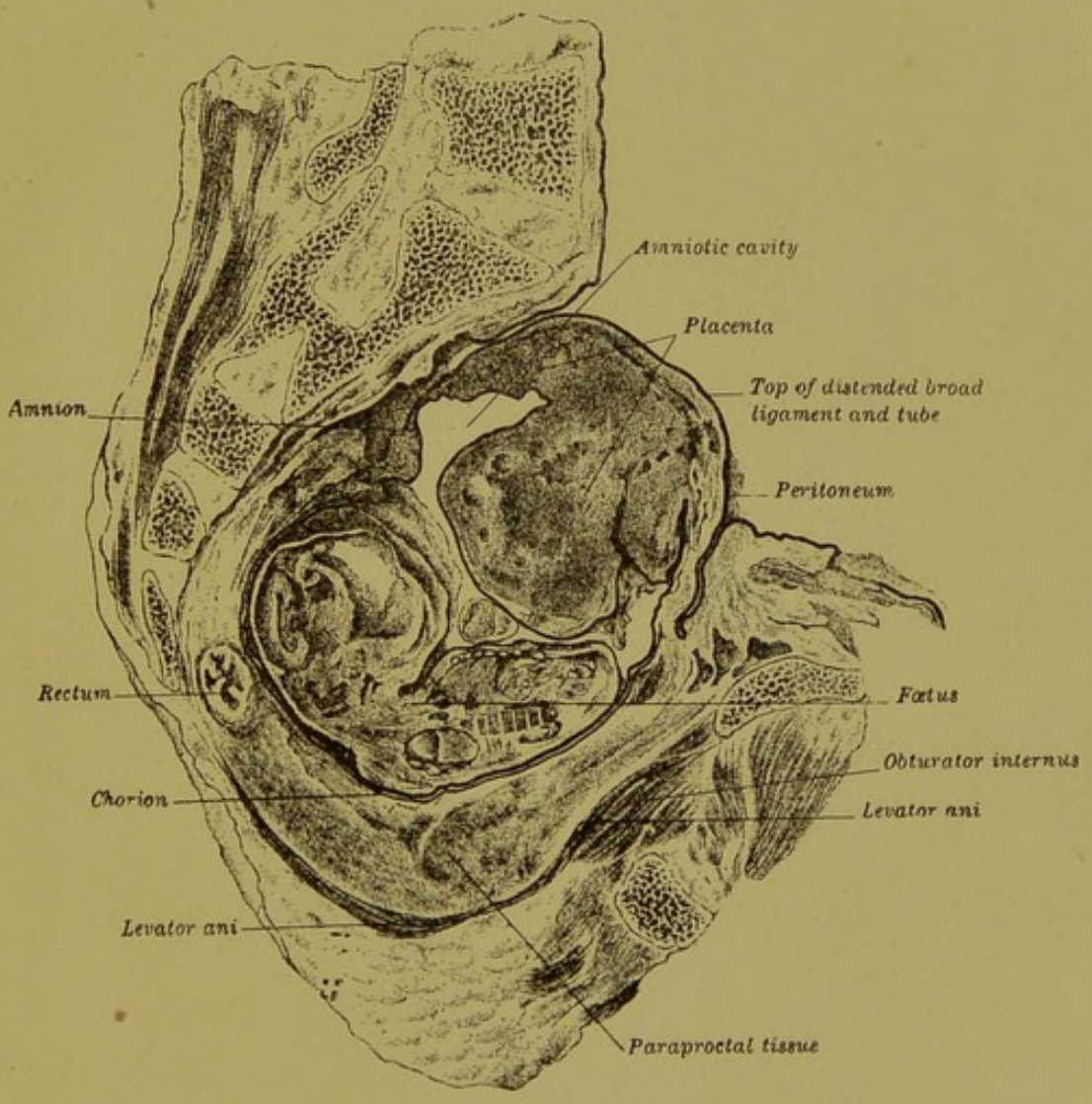
No attempt has been made in this review to give the literature of

the subject. With Mr. Tait's treatment of extra-uterine gestation, there is little need or use for ancient literature, save as it may be necessary to show how little was really known concerning it pathologically; *practically* nothing.

His treatment marks a new era in the handling of this condition, and may be taken as the starting-point of its real surgery.

[From *Annals of Gynecology*, Boston, February, 1889. By permission.]

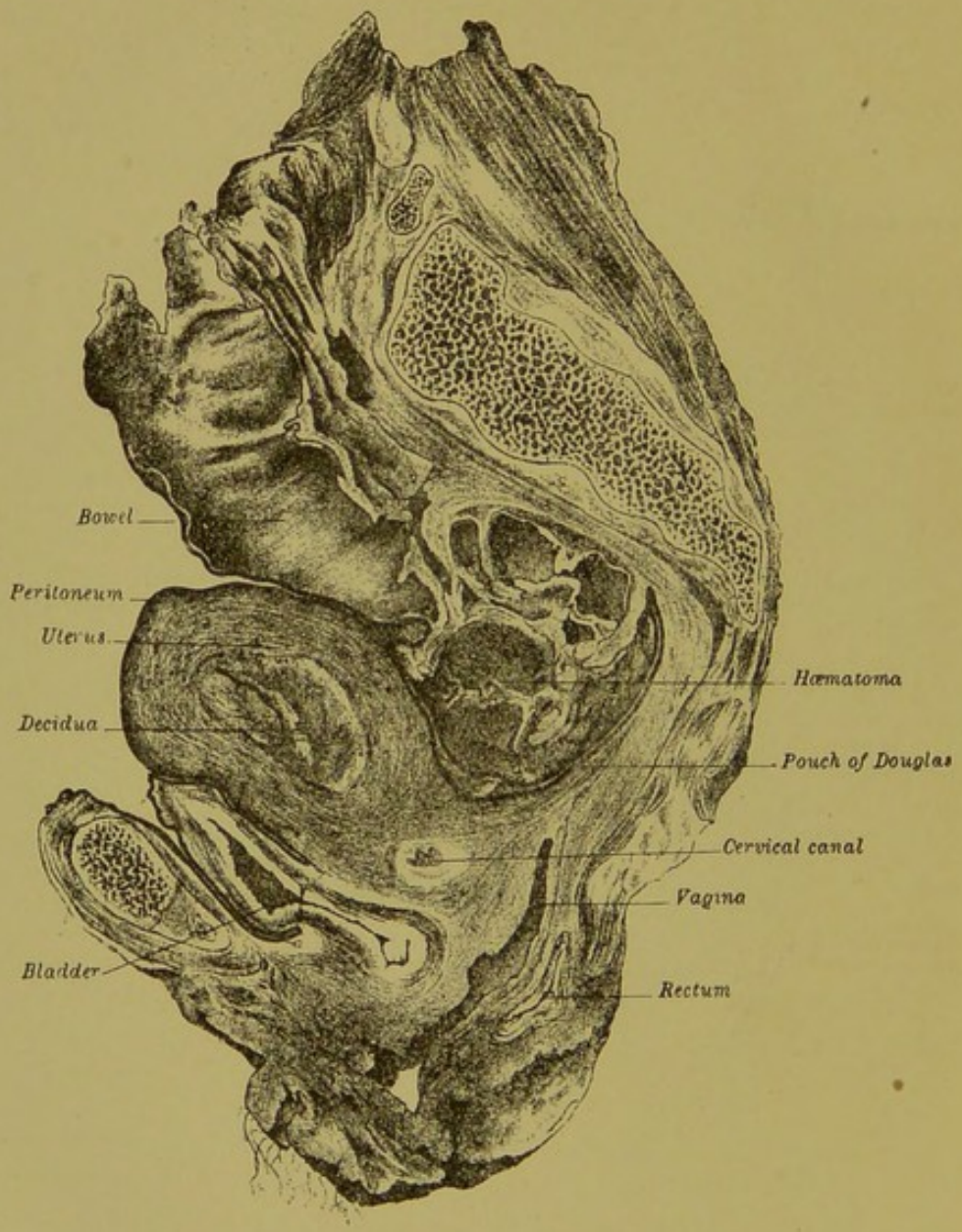
PLATE III.



Sagittal lateral section (right) of pelvis, with extra uterine gestation in right broad ligament.—Tait.

[From *Annals of Gynecology*, Boston, February, 1889. By permission.]

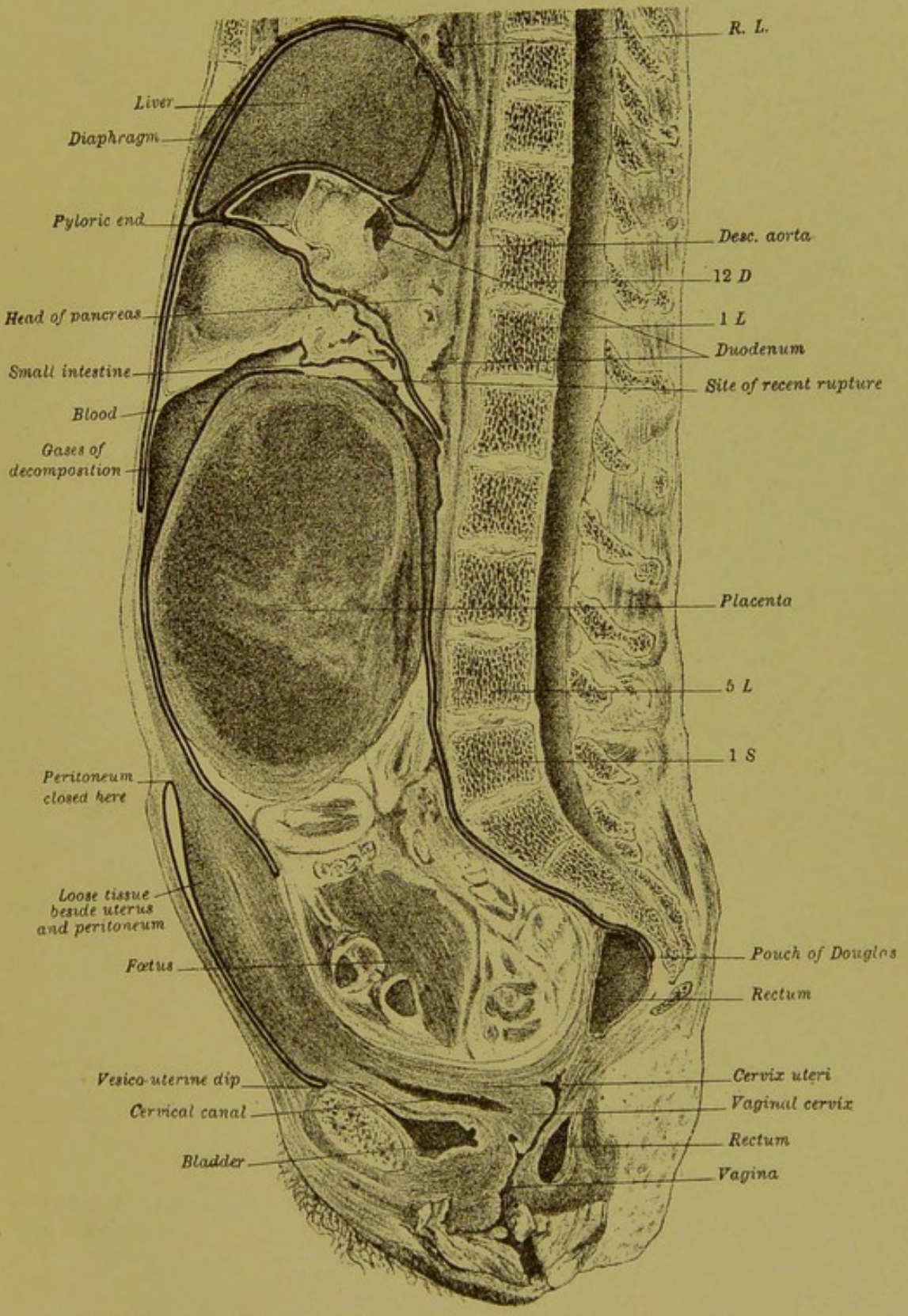
PLATE IV.



Sagittal mesial section of same pelvis, showing uterus with decidua. This section demonstrates, *inter alia*, that what is termed clinically retro-uterine hematocele, may be hematomata.—Tait.

[From *Annals of Gynecology*, Boston, February, 1889. By permission.]

PLATE V.



Sagittal mesial section of cadaver with advanced extra-uterine gestation—subperitoneo-abdominal.—Tait.