draw the kidney up into the wound and hold it there until adhesion has taken place sufficient to retain it in an unmovable position. For more than a year I employed the stitch suggested by Brödel from his anatomic studies, which is similar to that described in Dr. Goelet's paper. The principle of this suture is that by its triangular introduction it snares, as it were, the connective tissue stroma of the kidney and thus bears more strain than does the simple suture passed directly into the cortex of this organ. I do not believe this suture can be improved on. The only question is the serious one, is it advisable to introduce directly into the pulp of the kidney any suture? I know well that, as a rule, no serious complication follows this procedure, but I believe it would be better and more rational to employ the method suggested by Edebohls. For the last year I have constantly employed the latter, and am so far entirely satisfied, although I have not had sufficient experience to justify me in fully commending this method. The third method has not appealed to me as a satisfactory surgical procedure, although Beyer, Penrose and others have had success with this method. Until I have further evidence my choice of method will be that described by Edebohls.

DR. C. S. BACON, Chicago—Does Dr. Goelet use the subcuticular suture and also drainage?

DR. GOELET—I use the subcuticular suture for closing the skin only.

DR. C. L. BONIFIELD, Cincinnati—Many movable kidneys do not really require an operation. A movable kidney is somewhat like a hernia. The vast majority of hernias in the adult require operation, but I have known cases of inguinal and femoral hernia to disappear when the patient became robust and took on additional flesh, and to recur during or after a long spell of illness. I think the amount of mobility of a kidney depends largely on the amount of perirenal fat. Many of the cases operated on for movable kidney do not require surgical treatment at all, although I do not mean to question Dr. Goelet's cases. I would advise the general practitioner to treat the neurasthenia, the indigestion and the general health of the patient.

DR. D. H. CRAIG, Boston—I have seen a number of cases of movable kidney associated with splanchnoptosis that have suffered materially through the perfectly honest and conscientious efforts of general practitioners who, in trying hard to keep abreast of the times, have prescribed abdominal belts. The belt supports temporarily and possibly benefits the patient for the time being, but only in a certain degree. After the belt has served this purpose the patient is left in a worse condition for operative procedure than before.

DR. A. H. GOELET, New York—One reason why this suture is as strong as it is, and why it will pull the kidney up into its normal position under the rib without tearing out, is that no matter which way you pull on it the traction is in an upward direction parallel to the surface of the kidney and its fibrous capsule and not at a right angle to it. There is one objection to leaving the drain in for more than twenty-four hours. I find that when I remove the drain there is a great deal of accumulated discharge behind it, and if this discharge is allowed to remain there it will get in between the kidney and the structures of the back to which the kidney has been attached and thus interfere with the formation of adhesions. That is, the gauze ceases to be a drain after that time. I laid particular stress on the importance of stripping the colon from the kidney. I believe that is one of the most important points in making a success of the operation, and one of the most frequent causes of failure when it is neglected. Where it is left attached to the kidney, if it does not pull the kidney loose it will drag on it and cause pain and other disagreeable symptoms. I have left the gauze drain out in a number of cases and have had success in every instance. Sometimes I think it is not necessary. When there is very little fatty capsule to get out of the way I frequently leave out the gauze drain and my results have been just as good. As to stripping the fibrous capsule from the kidney, I see no reason for mutilating the kidney in this manner when we can secure fixation just as well and better without doing so. If the detached

fibrous capsule is utilized for fixing the kidney it is invariably fixed too low down. I have had a number of patients come to me after operation by that method by other operators, and they were still suffering, though the kidney was fixed, even worse than before the operation. I therefore oppose that method of securing fixation of the kidney. I see no reason for considering this a serious operation, as Dr. Clark contends it is. If I can do 159 nephropexies without a death—and others may have the same results if they adopt the same method—it can not be a very serious operation. My sutures do not penetrate the parenchyma. The needle may wound it in penetrating beneath the fibrous capsule, but that is insignificant and does no harm. Formerly, when a patient would not consent to an operation I yielded and ordered a belt. But now I never prescribe a belt before operation if I can avoid it. In the first place it delays the operation because the patient gets temporary relief, but she invariably comes back worse than before, and the operation becomes a necessity sooner or later. Two years ago I was consulted by a lady with a prolapsed kidney that was causing symptoms. She felt obliged to postpone operation and I prescribed a belt. She returned a little later saying that she felt so well that she would not have an operation done. Two years afterward she came back to me for another trouble. I asked her to let me examine the kidney, which she said was giving her no inconvenience. I found it fixed in an abnormal position as the result of perinephritic inflammation caused by irritation from the belt, and examination of the urine showed a pyelonephritis, which did not exist at the time of her first visit. This is an illustration of what the belt will do, and emphasizes the necessity of early operation to correct the malposition. The corset, or any other form of external support, is to be placed in the same category with belts and is open to the same objection.

INHIBITED TUBAL PERISTALSIS: A CAUSE OF ECTOPIC GESTATION.*

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In submitting this contribution for your consideration, its brevity may be urged as a virtue. A great deal has been written concerning the etiology of ectopic gestation, some of which has approached demonstration, more has been speculative, but certainly much has been done toward the solution of many of the attending phenomena.

The function of the ciliated epithelium of the oviducts has been made much of as the chief, if not the sole, motive force in the transportation of the ovum into the uterine cavity. Building on this assumption Tait and others have attempted to show that in the destruction of the cilia by the inflammatory diseases of the oviducts, the function of the tubes is destroyed and the resulting inertia is to be regarded as the prime factor in the production of tubal pregnancy.

According to Lilienthal, Williams and others, the most frequent site of the chorionic attachment is at the isthmus, near the uterine horn, which would make it appear that if the cilia are really the essential factors of the transportation apparatus the destructive force of the inflammation must have spent itself uniformly in the uterine end of the tube, which is not in accordance with the observed facts in the history of salpingitis. There are many instances of tubal pregnancy in which the cilia appear to be present in normal condition and abundance. In some cases anatomic peculiarities, such as sacculations

* Read at the Fifty-fourth Annual Session of the American Medical Association, in the Section on Obstetrics and Diseases of Women, and approved for publication by the Executive Committee: Drs. A. Palmer Dudley, H. P. Newman and J. H. Carstens.

and diverticula, have been demonstrated and are apparently the determining cause of the abnormal location of the embryo. Aside from these purely mechanical and obstructive causes there are other pathologic conditions of the tubes resulting from inflammation which are entirely overlooked by the followers of Tait, and which are of a quality to be justly accredited as being direct causative agents in the production of extrauterine pregnancy.

Again, it is well known that a great many cases occur in tubes giving no history of disease and in which no local pathology can be demonstrated, so that the conclusion is that ectopic pregnancies occur in some instances in perfectly healthy tubes. From these considerations which might be presented in a more elaborate manner, I think we may justly question the accepted position of the ciliary motion as the force which paddles the ovum down the tubal canal into the uterine cavity, and that we are compelled to seek some other explanation of the performance of this function.

The fallopian tube is in a certain sense an excretory canal and is similar in its anatomy to the ureter, the vermiform appendix, gall ducts and the intestine. Like them, it is provided with longitudinal and circular muscles. In all of these organs we have long since assigned an important rôle to these ingeniously arranged muscular fibers. The intestine, the appendix, the gall duct and the ureter are known to engage in an active peristalsis when sufficiently stimulated by the presence of materials within the canal, which it is their function to excrete. There is apparently every reason to suppose that the similar function of the oviducts is performed in identically the same manner, although the peristalsis of the tube when admitted at all has been referred to as a very minor and insignificant attribute.

I believe that for the performance of their function, that is, the physiologic emptying of all mucomuscular tubes, Nature has provided a general method, viz., peristalsis. This action when not interfered with by pathologic conditions or untoward influences operating through the nervous system, is at all times efficient and does not depend on an auxiliary force for the successful performance of its function. That ciliated epithelium does not invariably possess the function of a propelling force is evident by its presence in the lateral ventricles of the brain. There is a ciliary wave toward the body outlet in all mucous surfaces which have this peculiar epithelium, but it seems to be for defensive purposes.

In the fallopian tube I believe the cilia are provided for another essential and an entirely different purpose. The ovum is a most perishable structure, one whose delicate walls could not withstand the pressure of contracting mucous surfaces brought into apposition through the agency of peristaltic force. Therefore, in order that this force may not prove fatal to the ovum, it is necessary that some provision be made by which it shall be protected from this peristaltic pressure in its journey to the uterine cavity. Now, the arrangement of the cilia provides a bed of velvet on the pile of which the hope of the race safely rests in passage. The pressure of the visitor through the delicate ciliary bed conveys the signal to the presiding nerve center and the rhythmical muscular contractions are at once inaugurated and the ovum is gently rolled along into the uterine cavity. If we admit that peristalsis does play a very important part in the transportation of the ovum, then certainly the numerous factors which occasionally operate to produce paralysis of function in similar structures may fairly be regarded as causes of tubal gestation.

We are familiar with the serious results of inflammatory adhesions affecting the intestines and the appendix, not only in the mechanical constrictions, but also the interference with peristalsis from the abnormal fixation, and it is extremely probable that similar affections of the tubes are equally potent to work disastrous interference of function. The reflexes must not be ignored in this consideration. When an impacted calculus in the urethra causes such evidence of bowel obstruction that operation is determined on, it is not unreasonable to suppose that the function of the tubes may be likewise affected in a similar manner and degree.

Psychical effects are also of noteworthy importance. We are familiar with the cases in which the menstrual function has been immediately and permanently abolished through the mysterious influence of some profound and sudden revulsion of feeling, some horrible experience or great shock, etc. The hope or fear of pregnancy not infrequently generates the subjective symptoms and many of the physical signs of that condition. Evidence is not lacking to sustain the belief that similar agencies produce in the tubes results of a like quality to those observed in similar structures which offer more abundant opportunities for demonstration.

A very suggestive case, recently referred to me by Dr. Patten of Morristown, Ind., is worthy of notice:

Mrs. B., aged 32, the mother of one child, 4 years of age; no history of pelvic disease could be ascertained; during her pregnancy no unusual symptoms had been noted other than some slight intestinal disturbances; since her confinement, however, she had experienced rather frequent attacks of a colicky pain in the umbilical region.

Feb. 19, 1903, I was called to operate on her for a painful, elongated tumor of the left lower abdomen. Her last menstruation had occurred one month previously in a normal manner. The only symptom complained of was the rather sharp and persistent pain in the left side. A laparotomy proved the tumor to be the pregnant left fallopian tube distended to the size of a sausage roll and firmly attached at the fimbriated extremity to the transverse colon. The uterus was apparently suspended in this manner, the fundus inclined toward the right side, the left horn occupying the highest point near the median line.

I can see but one explanation of this peculiar malposition of the tube. It could not possibly have been the result of the ordinary chance occurrences, but was undoubtedly carried upward with the development of the pregnant uterus (possibly a pregnant left horn) becoming firmly adherent to the colon through the agency of an unrecognized inflammation, and, as the uterus receded following delivery, this rare relationship was maintained. The attachment to the gut was of a very firm and intimate character, requiring the most careful dissection in its separation. As a result of this firm attachment the tube was constantly stretched between two practically fixed points, the weight of the uterus continually taking up whatever slack the colon was disposed to grant. Under these circumstances there could scarcely be any possibility of tubal peristalsis, and when pregnancy occurred within the inert tube there was no force present capable of propelling the ovum down into the uterine cavity, and the chorionic attachment near the fimbriated extremity of the tube was the result.

As the tubes both appeared to be anatomically normal, it seems to me that the logical conclusion is that the abnormal location of the gestation sac was due to the inhibition of tubal peristalsis. I will also suggest that the inflammatory thickening of tube walls, and also the splint-like action of adhesions, may so interfere with

peristalsis that tubal pregnancy may result, regardless of the condition of the cilia.

There is undoubtedly a lack of positive knowledge concerning the pathology of ectopic gestation, and this presentation of an unusual phase of the subject is made with the hope that it may in some slight degree stimulate further investigation relative to this important matter.

DISCUSSION.

DR. L. H. DUNNING, Indianapolis—We can not dismiss the subject on the ground that we know nothing about it, for the reason that we know that there are conditions which are at least conducive to the development of an ectopic gestation, such as crippled and diseased tubes, malposition, loss of cilia and thickening of the tube by endometrial deposits, etc. Dr. Pfaff is very logical, but I do not believe he has settled the question.

DR. HUGO EHRENFEST, St. Louis—The theory advanced by the essayist is very interesting and very similar to the hypothesis advanced some time ago by Oliver, an English gynecologist. He also contends that the lack of peristalsis in the tube has much to do with an abnormal lodgement of the ovum in the tube. He suggests a connection between absence of sexual feeling and lack of peristalsis in the tube. During the sexual orgasm the uterus and, in all probability, the tubes contrast. Oliver believes that in women who lack sexual feeling entirely there may be a lack of peristalsis in the tubes. I think, however, that a paper published about a year ago by Opitz solves the question of the etiology of ectopic pregnancy satisfactorily. Almost all the investigators made the place of implantation of the ovum the object of microscopic examination. Opitz limited his investigations to that part of the tube lying between the site of implantation and the uterus itself. He examined 23 pregnant tubes, cutting the desired portion of the tube into serial sections, and in every one he found changes due to inflammatory processes. Of course, the changes were different in degree, but he found common to almost all the tubes a thickening of the mucous membrane, a partial destruction of the epithelium, and that very many of the adjoining folds were agglutinated at their edges forming blind hollows or sacs. That would give us a very plausible idea for the occurrence of tubal pregnancy. There are cases on record where the abnormal implantation of the ovum was explained by the fact that there was a congenital diverticulum of the lumen of the tube. Such a malformation of the tube, however, is very rare. If the formation of such blind alleys really is an almost typical result of inflammatory processes in the tubes, as suggested by Opitz, it would seem natural that ova should often be caught in these sacs on their way from the ovary to the uterus.

DR. G. BETON MASSEY, Philadelphia—Several years ago, by inquiry in a number of these cases, I learned that a large proportion of women suffering from ectopic pregnancy had some time previously been subjected to forcible dilatation of the cervix. I do not mean to say that the dilatation caused the subsequent extrauterine pregnancy, although it might have done so. But a more probable explanation is that the dilatation was done for a condition which did not prevent the consequence of that condition. The dysmenorrhea being really due to a mucopurulent catarrh the dilatation was not a success. This subject of forcible dilatation as a cause of extrauterine pregnancy deserves further investigation. Abnormalities of pelvic functions should be considered more as a physiologic deviation, and not as though the pelvic organs were a non-vital mechanism which could be patched up every time the mechanism was out of order.

DR. J. H. CARSTENS, Detroit—In nearly all cases of ectopic gestation one of Nature's methods is to cause adhesion of the tube somewhere to prevent a so-called tubal abortion; thus the fetus is held in the tube and hemorrhage prevented, and if the tube distends it does not cause the passage of the fetus and the placenta out of the end of the tube, but in the direction of least resistance, that is, in the broad ligament. With hemorrhage in the broad ligament there is less danger. That

generally subsides on account of the dense peritoneum covering which is one of Nature's methods of preventing death. We find adhesions in every case, but nearly all are recent. The tube is adherent to the rectum, sides of the pelvis or bladder or anywhere, showing that there has been an old adhesion; some old lesion that has not been absorbed and has probably caused a twisting of the tube, preventing its physiologic action and thus inducing the ectopic gestation. This contribution adds one point to the complex and diversified etiologic factors that produce extrauterine pregnancy.

DR. F. F. LAWRENCE, Columbus, Ohio—Interstitial extrauterine pregnancies occur in the uterine portion of the tube, and also in the fimbriæ ovarica. What effect can peristalsis have on these parts? Again, nearly all have noticed, in operations for salpingitis, constricting bands all along the tube at irregular points which practically occlude the tube, so as to prevent the passage of spermatozoa or the unfructified ovum. Several of these bands frequently occur on a tube that otherwise has no evidence of serious inflammation. Are not these partial or almost complete bands an exciting factor? Has any one had a case of ectopic gestation in which there was not found on close questioning a history of tubal trouble prior to the pregnancy? I have yet to find a case in which there was not a distinct history of tubal trouble, especially premenstrual pain or irregular menstruation. Every woman who is or has been the subject of tubal inflammation, no matter of what variety, is in danger of tubal pregnancy.

DR. C. O. THIENHAUS, Milwaukee—I believe there are many causes for this malformation. The idea has been advanced that all cases of extrauterine pregnancy show previous gonorrheic infection of the appendages. It is true that careful examination of many cases will reveal that a previous inflammation existed in the lower abdomen. In other cases we find that the patient has one child and after a period of three to five years, during which she showed at one time symptoms of tubal inflammation, she becomes pregnant in the tube. But there are other cases. I found in one case a cyst in the broad ligament as large as a man's fist, the tube on the right side was hanging over the cyst containing on its fimbriated end, which was adherent in the depth of Douglas' pouch, the extrauterine gestation. In another case I found a dermoid cyst of the ovary as large as a man's fist, which was probably the cause of the extrauterine pregnancy. The appendix in this case was found in a state of chronic inflammation and adherent to the gestation sac. Diverticula in the tube may be another cause. It is essential not to forget that in all cases of tubal pregnancy that part of the mucous membrane of the tube on which the ovulum is implanted must have been normal at the time of nidation.

DR. A. PALMER DUDLEY, New York—Many women become pregnant who have appendages very much adherent. It is not a question of imperfection of the tube. In my judgment the cilia play a larger rôle than has been accredited to them. But we must not lose sight of the fact that the dynamics of the abdominal cavity enter in here in the matter of the conduction of the ovum into the uterine cavity, as will be better illustrated by the records of cases where a hydrosalpinx is drained through the uterus. The constant diaphragmatic action of the pelvic floor; the action of the diaphragm and intestines plays an important rôle in the passage of the ovum from the ovary to the uterus. The most important question, I think, is the patency of the tube, no matter whether the lining is ciliated or not; it is a vent. As an illustration that the tube may be occluded and pregnancy take place is a case recorded by Bandl, where a vaginal hysterectomy was made and the uterine extremity of the tubes brought down into the vaginal vault. This woman became impregnated and had a tubal pregnancy of two and a half months, which aborted into the vagina. In my judgment the question of patency of the tubes is the all-important one, and then the dynamics that assist in carrying the ovum to the uterus.

DR. T. J. BEATTIE, Kansas City—I believe that every case of ectopic pregnancy would show a history of preceding trouble in the tube in some portion of the pelvis. About a

year ago, in a ruptured tubal pregnancy, I found a small cyst in the broad ligament.

DR. O. G. PFAFF, Indianapolis—As we all seem to think, there is in most of these cases a pre-existing tubal disease, but I have found pregnancies in tubes that were absolutely normal, although this is probably rare. In reply to Dr. Lawrence, the uterine end of the tube is just the point where we get most of our tubal pregnancies. The object of the paper was to get away from the purely mechanic causes of tubal gestation and to consider whether there is not some explanation to be found in the interruption of tubal peristalsis.

CONSERVATIVE SURGERY OF THE SCLEROTIC OVARY.*

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The real risk to life appertaining to the early peritoneal surgery, in the past, incurred and justified very radical measures. The comparative safety of the modern methods of operating no longer sanction special indications and rules for this field of surgery. Utmost conservatism is the essential characteristic of the principles and practices of general surgery. To-day these must apply to, and, fortunately, quite generally prevail in, gynecic surgery. Efforts along this line show eminent successes, albeit many disappointments as yet attend such a course. Its limitations require as yet greater definition. The notable gratifying result obtained in the following case has offset, in the writer's experience, many less satisfactory and even disappointing results from conservative operative work persisted in through many years. Its narration here, it is hoped, may have it exert its stimulating effect on the efforts of those likewise engaged.

Cirrhotic ovaries at this time, I believe, are quite generally accepted to afford the indication for their immediate removal. My experience is not ample enough to draw deductions from. The case about to be recited pertains to cirrhosis without decrease in size of the ovaries. Pertaining to sclerotic ovaries with shrinkage of the organs, the writer has no case of resection that was followed by pregnancy. However, it seems warranted from the subjective relief afforded in some instances and from the unmistakable evidences in some cases of an attempt on the part of Nature to restore the already lost function, that even in the shrunken ovary the morbid process can be arrested by timely conservative surgical effort. The writer hopes soon to report his experiences with such efforts.

The extensive and exhaustive consideration of this subject on this occasion by our worthy president relieves the writer from entering into a detailed consideration of the mooted points in connection with the following case:

History.—Mrs. C. L. F., Kidley, Ill., aged 25. Married four years, desirous of having offspring, no conception. First menstruation at 13. Menstruation irregular, commonly retarded, is always painful before and during flow. Following a heavy lift at 18 patient suffered constantly with pain in left inguinal region. At periods she bloats, and has sacral, pelvic, occipital and frontal pain. Poor appetite, depression and growing emaciation, weakness and suffering mark her complaints. She has occasional transient attacks of bladder irritability and suffers from constipation.

Status præsens.—Patient is a small, lean, weakly woman. Floating tenth ribs, both kidneys movable. Thin, relaxed ab-

dominal walls, flat miserable thorax. Uterus in retroflexion, somewhat fixed by contracted left broad ligament. Left ovary imprisoned by adhesions, tender, enlarged. Right ovary normal size. Slight contraction of internal os uteri.

Diagnosis.—Retroflexed uterus. Prolapsed and enlarged adherent left ovary.

Operation.—Deaconess Hospital, Jan. 16, 1902. Internal os was dilated. No curettage. Median celiotomy. Tube and ovary on left side were massed by inflammatory adhesions. No pus was found. Left ovary had cyst the size of filbert at one pole. Both ovaries were densely and thickly sclerotic, rather larger than normal size. Left ovary was removed entirely. A narrow wedge was cut from the entire length of the convex border of the right ovary. This displayed a ledge of sclerotic tissue one-eighth of an inch and more in thickness, revealing no evidence of normal ovarian stroma in this area. The ovary in its deeper parts, like in the superficial parts, bled very slightly, but in contrast with the latter revealed small islets of what seemed normal stroma. Indeed, this was so little apparent as to, in my estimate, include very little promise. However, there had been menstrual flow which could not be discountenanced. The surface of the ovary was pared in wedge form, the base of the wedge being at the border. The central slit was sewed with interrupted catgut sutures. It was striking that there was practically no bleeding. The uterus was ventrosuspended by its anterior surface near the fundus.

Patient made an uneventful surgical recovery, though her strength was slow to grow. Her feebleness preceding her operation seemed accentuated at this time.

Results.—Patient reported for examination two months later. There was some general improvement all along the line, though general conditions were still very unsatisfactory. Menstruation had occurred regularly, with lessened local and reflex suffering. Hygiene, iron, ergotin, strychnia and aloes were prescribed.

Patient reported again July 17, 1902. There was great general improvement, physical and psychical. She walked like an entirely different woman. She had missed her flow and was anxious about this. She complains of some pain through the sacral and lumbar region. Bladder had continued occasionally irritable, more so latterly.

Examination.—Uterus is found in good position, enlarged, softened, not tender. Vaginal mucosa softened and edematous, of bluish color. Right ovary to touch feels quite normal as to consistency, though obviously small. There are no evidences of ovarian adhesions.

Diagnosis.—Pregnancy.

March 17, 1903, patient writes me of her happy confinement with a fine nine-pound boy two weeks previously, and expresses her and her husband's unbounded happiness over the event.

DISCUSSION.

DR. L. H. DUNNING, Indianapolis—Dr. Pantzer's innovation worked well in this case. But he himself raises the question whether this method is commendable, viz., to leave such a large raw surface on the ovary. I have always felt it safer to cover all raw surfaces of the ovary. I think Dr. Pantzer's experience was unique in that he had no hemorrhage. I have never been able to do so much cutting on the ovary as he did without experiencing considerable difficulty in arresting hemorrhage.

DR. A. PALMER DUDLEY, New York—I do not question that Dr. Pantzer left the ovary an open wound. He said he closed the wound by a circular suture. If he did that there was no necessity of covering it with peritoneum to get good results. Cirrhosis of the ovary is due to obstruction of the circulation. His case was complicated by adhesions and dislocations, and one ovary contained a cyst. I have operated on very many of these cases and have seldom found a true cirrhotic ovary fruitful after any form of treatment. I think the relief the ovary obtains from this method of treatment was not due solely to the ovary itself, but to the repair of pathologic conditions that accompanied the cirrhosis and the ovary also

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