THE VALUE OF CONSERVATIVE TREATMENT OF THE UTERINE APPENDAGES.

AS OBSERVED IN THE LATER RESULTS OF RESECTION OF
OVARIES AND OPENING OF TUBES IN NINETY-
SEVEN CASES.*

A. GOLDSPOHN, M.S., M.D.

Professor of Gynecology, Post-Graduate Medical School; Attending
Gynecologist to the German, the Post-Graduate and
the Charity Hospitals, Chicago.

CHICAGO.

This work was commenced by the lamented Carl Schroeder, who published, in 1884, five cases of resection of an ovary to preserve ovulation and menstruation, in cases of bilateral multiple cystic degeneration of Graafian follicles. He advocated this treatment only for patients who are neither near the menopause nor already mothers of a number of children, and limited it to cases where the parts retained are safely healthy and no papillomata or other suspicions of malignancy are anywhere found. Aug. Martin reported 10 cases in 1889, 11 in 1891 and 6 more in 1893. Of these cases, 24 were subsequently available for longer observation; 8 of them became pregnant and 2 had recurrent disease. Out of 40 cases of salpingostomy, 1 became pregnant.

In 1891, W. H. Polk reported 10 cases of salpingostomy and 9 of section of ovaries. Of the total number, 15 were afterward examined and found to be successful in from 75 to 100 per cent. In 1893, this treatment was advocated by v. Winkel, Hoffmeier, Schatz, Zweifel, and P. Mueller, who suggested the destruction of cystic follicles by the thermocautery; and it was opposed by Hegar, Leopold and Fritsch. At that time and in 1895—by Donnett—Pozzi reported 23 cases of resection and ignipuncture of ovaries, of which 19 were successful, 4 of these becoming pregnant, and 3 required a second operation. He did not practice salpingostomy. In 6 cases of bilateral cystic ovarian neoplasms, 4 being dermoids, F. Matthaei, Berlin, in 1895, had performed resection of one ovary, and 5 of the patients subsequently bore children. In 1900, Burrage reported 60 subjective cures out of 85 total traced cases of salpingostomy and resection of ovaries, after an observation of at least a year. In 41 of these there had been pus somewhere in the adnexæ at the time of operation. An anatomical cure was achieved in 33 out of 57 cases actually examined. Fifteen pregnancies had occurred and in 5 cases a secondary operation was advised. A. P. Dudley, in 1898, had observed 14 cases of pregnancy in 88 cases of such conservative treatment and he says that in only one case among all those examined, and that was gonorrheal, was he able to find a return of inflammation in the parts that were bimanually palpable. C. Martin, Birmingham, and R. Gersuny, Vienna, favor this mode of treatment in follicle cysts and benign neoplasms of ovaries, after a more limited experience with it. A. Maximo, Russia, has demonstrated the fact that not merely the germinal epithelium on the surface of an ovary does multiply mitotically and cover a defect, but that the deeper ovarian tissues also regenerate themselves and increase. He operated on 40 rabbits and 2 guinea-pigs and made exact histologic studies of the tissues involved, obtained at the death of the animals in from 5 hours to 80 days.

Some unfavorable results have been recorded, as fol-

lows: H. C. Coe reports 8 cases in which it was not satisfactory, because either the disorder required a second operation, or because it continued or recurred, or the artificial menopause was not averted, but merely delayed a little. The case reported by L. Fischer, Vienna, and the 4 cases by Waldstein at the Schauta clinic, can not fairly be counted, owing to the fact that in these cases cysts subsequently developed from diseased parts of ovaries, involuntarily left behind in efforts at total extirpation of the parts for severe septic disorganization, only because the parts retained were beyond the reach and inspection, if not the knowledge, of the operators via the vaginal route, and were not designedly selected and reconstructed, as resection implies. This treatment is applicable mostly to ovaries that have undergone cystic degeneration of Graafian follicles and corpora lutea, which results in some cases as a sequel to earlier systemic infectious diseases—exanthemata, diphtheria, typhoid, etc. In other instances they partake of the nature of retention cysts, the follicles having been prevented from rupturing and from discharging their contents normally, owing to inflammatory thickening of their walls and of the tunica albuginea. But very often the condition is that of edema in which the ova die and is, therefore, called a hydrops of the follicles by some; this condition arises from an impeded venous circulation, i. e., a varicose condition in the ovarian circulation, such as most frequently results from descensus (prolapse) of the ovary, either alone, or more frequently, in conjunction with retroversion of the uterus.

The pathologic nature and gravity of these cystic follicles, varying in size from a pigeon's egg to a small hen's egg, has been well established by the findings of Virchow, Klob, Orth, Ziegler and others, and their capacity to cause suffering is well understood by unbiased, practical gynecologists of real experience, who have neutrally observed a larger number of such cases personally for a longer period of time and have exactly and repeatedly read their pelvic status bimanually, both before and after surgical or other mechanical relief of the condition was instituted. Ovaries with such cystic follicles cause much more local and also reflex neuralgic pain than arises from ovaries, the seat of actual neoplasms (cystomata), which are of larger size than the inflammatory or degenerate follicle cysts, but not yet large enough to mechanically encroach upon the neighboring organs. Such ovarian tumors frequently cause no symptoms at all in the beginning and are then only incidentally discovered. Among the ovarian neoplasms, dermoid and parovarian cysts have little or no tendency to malignancy and in their removal the retention of as much as possible of normal ovarian tissue, is both a safe procedure and a paramount requirement. More care is required in the selection of cases for the conservation of ovarian particles in cases of glandular ovarian cystomata—true ovarian cysts. A number of operators specify that they must be non-proliferating, must not bear any surface papillomata and that there must be no suspicion of malignant developments anywhere in the patient. A detailed report of several cases of this kind with others and their subsequent condition will be given elsewhere.

In view of the extreme value of this conservative treatment, if it be successful, and because there still are many who doubt its success, I have undertaken the considerable task of finding out the subjective and anatomic condition of all patients possible on whom I have performed such operations during the last three

* Read at the Fifty-second Annual Meeting of the American Medical Association, in the Section on Obstetrics and Diseases of Women, and approved for publication by the Executive Committee of the Section: Drs. A. H. Cordier, W. E. B. Davis and Henry P. Newman.

and one-third years, and who have been observed an average period of nearly two years after operation. This I fortunately succeeded in doing in 97 out of 108 cases. Of the number, 80 were actually examined by myself or other physicians, and in 17 cases an accurate and complete written statement by the patient, in answer to specific questions, was accepted. Of the entire number, 9 were treated by anterior median vaginal celiotomy, 32 by median ventral celiotomy, and 56 by bilateral inguinal celiotomy via the dilated internal inguinal rings, in conjunction with a thorough Alexander operation. Naturally resection of ovaries and salpingostomy are practically always auxiliary procedures to other operations of equal, and usually, greater importance, like the removal of neoplasms or of parts of these organs that have been completely disorganized by inflammatory processes, or the rectification of complicated displacements and of parturient injuries. The nature of all these allied indications taken together and the question of future fecundity in each case, determine the choice of the route for operation. The vaginal route, in patients who are intended or expected to retain a capacity for conception, is best limited to cases that have no displacement of the uterus to be cured, likewise no large neoplasms and no considerable purulent accumulations or exudates in or about the organs, except parametritic abscesses, which should be drained into the vagina. This natural and severe limitation of vaginal celiotomy in such conservative cases is wise also, because however favorable this route is for extirpation of parts or all of the organs, it is not auspicious for conservative work or reconstruction of the adnexæ, for when they are normally located, too much violence is done to their more important lateral supports in dragging them downward and inward into the narrow median opening below, sufficiently to do them any good. Even then, delicate resection and accurate plastic coaptations—the most ideal surgery on ovaries—is usually out of the question and thermocauterization must be used. Moreover, when an ovary is already so much prolapsed as to be readily accessible, its displacement can not be remedied via the vagina, and resection or cauterization of it then does little and only temporary good.

Ventral celiotomy I choose in all cases of solid or cystic tumors of the internal generative organs that do not require removal of the uterus and are not small and uncomplicated by adhesions or septic appendages; likewise for cases in which inflammatory processes have caused extremely firm or extensive fixation of the uterus and appendages, or have left pus, or its equivalent, probably present in or about them.

The third class comprises that large class of patients who are not near their menopause and who have neither tumors nor septic accumulations, but who have retroversions or retroversionflexions of the uterus that are complicated either by adhesions or by degenerate conditions of the appendages—the result of inflammatory processes that have run their course and have died out, or of long-standing embarrassment of the venous circulation incident to the displacement. If patients with such comparatively minor lesions are operated on at all, it should be with a practical assurance that their displacement will be cured permanently and not merely up to the time of their next childbirth, and also that parturition will not be complicated by the results of the operation. This crucial requirement, by the writer named “the double test of pregnancy” has so far been

quite uniformly achieved by the Alexander operation only. Furthermore, as the internal inguinal ring is fortunately directly in front of, and near to, the normal location of the ovary and ampulla of the tube on each side, fixations of the retroverted uterus and of the adnexæ can be relieved quite well by means of an index finger introduced through each Alexander wound, somewhat dilated; and these delicate organs can be led into these openings more easily and naturally than into any other opening that can be made in the abdomen or pelvis, and they can there be reconstructed and relieved of deleterious parts with the greatest facility. For these cogent reasons, this combination of intra-pelvic manipulation by touch alone, with the Alexander operation is the best procedure for the patient in the class of cases here considered.

The effect of the thermocautery is not precise and is not limited in its extent. Its destructive effect is too great in so small and delicate an organ as the ovary, and the cellular infiltration that occurs beyond the line of demarcation between the dead and living tissue, must induce more of a cicatricial condition than is occasioned by an aseptic plastic operation. In several cases I have observed a temporary, but distressing, amenorrhea after ignipuncture of an only ovary. But it is to be preferred when the organ is not sufficiently accessible for an exact resection, which is the rule via the vagina, and also, when a normal degree of asepsis is doubted in the ovary itself or its tube, or when pus has been encountered during the operation in such a way as is likely to contaminate the subsequent steps, or when fine, perfectly sterile and readily absorbable suture material is not at hand to use in resection.

Resection of ovaries, to be a thankful procedure and not to be followed frequently by a chronic tender or painful condition of the organs, must be done with the observance of the highest degree of surgical cleanliness. The use of sterile rubber gloves by all who come in contact with the wound, sponges, instruments and suture material, in addition to all the antiseptic treatment of the hands commonly in vogue without gloves, has materially enhanced the success of this more ideal gynecologic surgery in my experience.

As to the technic of resection of ovaries, single or isolated cysts bulging forth from its surface are removed by cutting away their projecting portion, peeling or scraping out the lining membrane from the remainder and closing the resulting wound by continuous sutures of fine catgut, after the edges have been trimmed, if necessary. Very hard and contracted, cicatricial parts are occasionally excised, forming a V-shaped wound which is closed in the same manner. Multiple cysts near each other, especially when more deeply seated, are best opened by a straight or curved incision on the free border of the ovary and extending usually not more than halfway through it. By this incision, or from its surfaces all follicle cysts of 1 cm. or more in size are opened, their lining is peeled or scraped out and then the entire wound is closed, after its surfaces have been coapted and some ragged edges have been trimmed, by means of two tiers of continuous sutures of fine catgut, as follows: in 1, the sutures go to or beneath the bottom of the wound, in order to control the bleeding; in 2, the edges are merely coapted and it terminates in a knot with the original end at the point of beginning. Thus a perfect plastic result is gained with the introduction of the least possible amount of foreign substance; a suture material; and that

introduced is of a very absorbable nature. The catgut is simply hardened in formalin and sterilized by boiling, but never chromicized; the needles are fine, round, non-cutting and have a full curve.

A tube that contains pus, even if this be no longer virulent, should be removed, because its lining is too much disorganized to functionate. But in cases of some such, smaller, closed pus-tubes, the ovary corresponding to it or a part of it, can be saved.

When an ovary or a part of it is free or can be liberated and saved, with or without resection, and its tube is closed and but little distended, the latter should be walled off with gauze, opened and its contents, if any, milked out. If these are not purulent nor tubercular disease suspected, the opening in the free end of the tube can be enlarged by a longitudinal incision of about 1 cm. and its mucous lining turned out over the wound edges and stitched to the outer coats to secure a permanent opening. When the ampulla is too disorganized it may be amputated and a salpingostomy done on the tube stump.

The principles and methods here stated have been practiced by me, with gradually growing conservatism, for over five years and their merits may be partly judged from the following preliminary statement of results of cases, the details of which will be tabulated in a larger collection on another occasion. The first section comprises 9 cases of vaginal celiotomy for inflammatory changes of moderate grade, with no pus. Of these, 8 were married women and parous, each of whom had one ovary and tube removed and the remaining ovary treated with the thermocautery, in addition to the usual operations for prolapse or retroversion or laceration of the cervix and perineum. The one maiden had both ovaries resected, and she is one of the two decided failures. Two others are not disabled, but have pain of variable intensity and frequency. Only 5 of this vaginal class are wholly well in these parts.

The category of median ventral celiotomy comprises 32 cases that were examined after an average period of twenty-four months after operation; 23 were parous, and 24 were married. In 3 of them, restoration or reconstruction of one or both ovaries or of one tube was done with most happy results, in connection with removal of bilateral cystic ovarian neoplasms, varying in size from an orange to a child's head. Twenty-nine of them presented results of inflammatory processes of a severer grade than either of the other two classes; 15 of them showing pus during the operation. Among the total number in this category, the thermocautery was used upon the only remaining ovary in 8 pus cases. Salpingostomy was done 6 times. Suspension of the ovary and tube on one or both sides in 8 cases. Plastic resection of one ovary was made 20 times and of both ovaries in 2 cases. In 27 cases or about 84 per cent. a subjective cure, and, as far as examined, also an anatomical cure was effected. Four other cases, 12.50 per cent., can work regularly, but have pain frequently, which is probably due in part to the resected ovaries. In one instance only did cysts reform and require a second operation.

The third class of 56 cases treated by bilateral inguinal celiotomy, presented markedly pathologic retroversions, complicated in many instances by adhesions and in all cases by a degenerated or disorganized condition of the adnexæ, which required reconstruction of some parts in all and removal of other parts in most of them, in conjunction with a very thorough shortening

of the round ligaments and usually also plastic operations upon the cervix or perineum, or both. Salpingostomy among these was done only once. Suspension of an ovary and ampulla of tube 9 times. In 40 cases one ovary—usually the only remaining one—was resected. In one case one ovary was resected and the other cauterized. In 15, both ovaries were resected. Average period of observation of all these cases was 23.20 months. Forty-eight of them were examined by myself or other physicians, and of 8 cases a complete and explicit statement in writing was accepted. In 49, or 87.50 per cent., of them the parts here considered were found entirely well, although in several of these it took from three to six months after operation for this recovery to develop. Five other cases are never wholly disabled, but have pains frequently which may be due to the resected ovaries. A subjective failure occurred in one hysteric and neurasthenic case and also one anatomical failure in another where larger follicle cysts recurred in an ovary.

During the average combined period of observation of a little less than two years, pregnancy supervened in 1 of the vaginal and in 1 of the ventral and in 8 of the inguinal cases; 7 of these matured and ended naturally. Two confessed to having abortion induced by "instruments in the womb," and one aborted without known cause.

The relative value of the routes for operation is shown in part by the observation that an entire cure of the former disorder was effected only 5 times out of 9 via the vagina—too small a number for conclusions in percentage. On the other hand, 84 per cent. of the ventral, and 87.50 per cent. of the inguinal cases became wholly well. The value of these conservative operations is better appreciated in view of the following facts:

1. It will be difficult for any operator, from his entire experience, to find 100 consecutive cases in which he has removed both ovaries, with or without the uterus, where approximately 85 per cent. will be found to be as free from pain and from distressing nervous and circulatory disorders, and to enjoy as good general health as that proportion of cases here mentioned.

2. In a majority of the cases of resection of an ovary herein reported, it was the single remaining ovary in each case, and, aside from resection, removal of that only ovary would have been the indispensable alternative. In that case these women would not merely have lost their sexual functions to a large extent, which contribute largely to the mental and physical equilibrium of most human beings, but they would also be denied the opportunity, if not the legal right, to contract marriage in the future, and to receive the care, protection and legal perquisites connected therewith.

3. Pregnancy occurred in 10 per cent. of the cases, and in the the absence of wilful pernicious interference its normal termination was substantially assured in all except one case.

REFERENCES.

- Winckel: *Lehrbuch d. Frauenkrankheiten*, 1885.
Zeitsch. f. Geb. u. Gyn., Bd. xi, s. 358.
Ibid., Bd. xxxi, H. 2, s. 345.
Samml. Klin. Vorträge, N. F., 343.
Amer. Jour. Obstet., vol. xxiv, p. 1039, 1891.
Ibid., vol. xxxvii, No. 1, 1898.
Ibid., vol. xlii, p. 195, 1900.
Annal de Gyn., 1893, p. 166.
Ibid., 1895, T. ix, p. 555.
Boston Med. and Surg. Jour., vol. cxxiv, Jan. 30, 1896.
Archiv f. Path. Anatomie, 15 Folge, Bd. x, s. 95.
Med. News, vol. lxxiii, p. 385, 1898.
Trans. Amer. Gyn. Soc., 1898 (A. P. Dudley).

British Med. Jour., 1898, ii, p. 791.
 Verhandl. d. Deutsch. Gesell. f. Gyn., 1893, s. 244-250.
 Fritsch: Krankheiten d. Frauen, 1893.
 Centralblat. f. Gyn., Bd. xxiv, s. 817, u. 1050, 1900
 Ibid., Bd. xxiii, s. 5, 1899.
 Hoffmeier: Grundriss d. Gyn. Operat., ii, Aufl. s. 381, 1892.

DISCUSSION.

DR. J. WESLEY BOVEE, Washington, D. C.—There is no question but what much can be done in conservative surgery of the ovary, less in conservative surgery of the tubes, if we mean by conservatism a retention of a portion of the organ. I do not believe, except in exceptional cases, that it is advisable to leave a portion of a tube when another portion must be removed. My understanding of the term conservatism is primarily the health of the individual, secondarily, that of function, and thirdly, mental impressions. It seems to me that an ovary bound down by adhesions from tubal disease is usually diseased throughout, and that these organs that we resect and suture again become adherent. When you set up traumatism along the wall of the ovary you find the omentum rushing there to protect it. I have often opened the abdomen and found adhesions where I had previously done nothing but simply punctured, with a thin narrow-bladed bistoury, simple follicular cysts in the ovary. When I find these ovaries I extirpate them. These patients have heat flushes and nervous storms for some time afterward, but I have not done this work long enough to say how long it will continue, although I have seen it last ten years and can not account for it in any other way. We can not always tell from the naked-eye appearance of an ovary what its condition is, and in many organs we find a lack of development, not a sclerocystic change, but one resembling a walled-off trouble which remains as long as the ovary remains. I believe in conserving as much as possible, and I believe in making the mind of the patient easy, but I do not believe in conserving structures that are likely to cause trouble in the future and that can be removed without danger to life, except in those cases where there is an expressed desire on the part of the woman as to the possibility of future pregnancy.

DR. JOSEPH EASTMAN, Indianapolis.—Dr. Goldspohn speaks of anterior colpotomy as a means of reaching diseased ovaries and tubes, but that it leaves a weak spot in the vagina; I believe that is a valid objection to doing this conservative work. In cases where we are certain the woman is past the child-bearing period, or where the operation necessitates the production of sterility, I am in the habit of bringing the uterus into an anteverted position, using that as a splint to prevent a cystocele. It is a valuable substitute in cases of extreme prolapse. I was much pleased with the Doctor's idea of going through the inguinal canal in preference to doing an anterior colpotomy. His work is certainly in the right direction. I agree with him that we should use suture material that does not remain so long. It seems to be the trend now to get material that will be absorbed rapidly, within a week or ten days at most.

I was also pleased with the Doctor's remark in regard to asepsis. We talk about it, but it is only the few and not the many who are capable of procuring aseptic wounds. He suggests the use of rubber gloves to make sure of aseptic hands. I accept that, but at the same time it must not be understood that I do so to the exclusion of thorough sterilization of the hand before the gloves are put on.

I take issue with Dr. Bovee in regard to saving some of these ovaries. A stormy menstruation is better than no menstruation. The retention of a sufficient amount of ovarian tissue to maintain sexual impulse is of vital importance to the patient. I have seen hundreds of these physical wrecks where the ovaries and tubes have been removed. These are questions which we should take home to the heart. True conservatism is that which seeks to preserve as much of an organ as possible. It is better to make a second or even a third operation and even to have a stormy menstruation than to deprive the woman of her sexual impulse.

DR. BERNARD COHEN, Buffalo.—It is now sixteen years since surgeons began removing ovaries and tubes promiscuously. About five years ago they became conservative. We must

not only preserve the patient's life, but also make her useful to her family. When the surgeon has opened the abdomen he must do all he can so as not to jeopardize her life again by a secondary operation. Many women pass a miserable existence or die because they will not submit to a second operation.

The use of gloves is becoming quite common through the East and we seldom see pus where we have absolute asepsis. It can be carried on in a small town as well as in a large city. In most cases where a small amount of the ovary is left, a degenerative process starts in the remaining portion soon afterwards. In watching the cases since 1896, when gynecologists became conservative, I noticed that many patients were having secondary operations, in 35 per cent. of which pus was found. This could only come through degeneration. When the abdomen is opened we had better remove everything found necessary without regard to subsequent nervous phenomena, or to the fact that if we leave a part of a diseased ovary she may have a child, or what is more likely, a secondary operation.

Anterior fixation through the inguinal ring is new to me. Dr. Frederick of Buffalo pulls the round ligament up, pushes a hole through the belly muscles, freshening the edges and stitching the ligaments on the muscles. It is a simple operation and the patients recover very rapidly and have little pain. The operation is too new to give any definite results, and should only be used after the child-bearing period.

DR. W. O. HENRY, Omaha.—I am sorry the Doctor did not define what he means by conservative surgery. As I understand it, it is the removal of all organs or parts hopelessly diseased, the saving of such as we have reason to believe will be restored to health or will not further menace health. If that be a correct definition, then I am in favor of conservative surgery. It is a mistake to remove both ovaries and tubes if only one of them is diseased. If we endeavor to save a diseased part it is but right and fair for us to explain to that patient that possibly another operation will be required later on. Although secondary operations are not usually required in these cases, I hold it is better to have to do a second or even a third operation occasionally than to do such complete work in every case.

A lady, childless, very anxious to bear children, a constant sufferer, came under my observation for treatment. We found large ovaries, adherent, dropping down into the cul-de-sac; the tubes were enlarged, and I informed her that one ovary and tube would have to be removed, and that possibly I could save the other; I explained the possibility of a second operation. She consented and I did the operation. I removed the tube, the end of which was sealed over by adhesions, and also one ovary. I split the top of the remaining tube, keeping it open by sewing mucous and peritoneal membranes together. The woman became well and a year afterward bore a child. I hold that even if I have to remove the other ovary the woman has profited immensely by conservative work. So, I say, let us do conservative work, but let us explain to our patients what that means. If they want you to take out everything that is diseased or likely to be, then go ahead and do a radical operation. If you fully explain to patients most of them will say: "Give me a chance; if you can save my menstrual and child-bearing functions, do so."

DR. GOLDSPOHN, in reply.—The removal of these organs when not decidedly diseased reminds me of the attitude of the general surgeon of 40 years ago; then he would amputate every leg that had a diseased joint. When he found out that the joint could be resected, he saved the leg. The gynecologist who is simply a surgeon does about the same kind of work as the general surgeon of that day. It is not right and I have very much at heart the sentiment expressed by Dr. Eastman that we should state the case fairly to our patients, explain to them what may be the result on the one hand and the chances on the other, and they will always decide upon a conservative operation. It means so much socially to young women whether they menstruate or not; not so much whether they can conceive. That is a mere sec-

ondary matter. You stop the menstrual function of a young female and who is going to marry her, and what does that mean in the future welfare of the individual? Would not some of them just as soon give up life?

I failed to state that there were 10 cases of pregnancy in the 97 cases of resected ovaries. One in the 9 vaginal cases, one in the 32 cases of ventral median section, and 8 cases after the inguinal operation. All of them, except three of the inguinal, went to term. In two of the inguinal cases abortions were induced.

An instance of what can happen from a little piece of ovary that will turn the tide with the patient's opinion of herself and the doctor's services enormously, is illustrated by the following case: A young woman, 19 years old, had pyosalpinx on one side and a cirrhotic, indurated ovary on the other, with a normal tube. After putting her to bed for a month, and giving her most approved medical treatment to avoid operation, it became evident, however, that an operation was necessary. The organs on one side were removed and the most indurated part of the other ovary was excised, leaving a little stump of ovary. The presence of pus in the case led me to choose the thermocautery in place of resection. In that case there followed amenorrhea for a year and a half and then a year in which she menstruated a few times, then she became pregnant and had a fine boy. As much as they blamed the doctor previously they are now glad that a radical operation had not been performed.

Ventral suspension of the uterus by means of the round ligaments was first done by Carl Beck of New York, then successively by Ferguson of Chicago and Gilliam of Columbus, Ohio. In cases where an Alexander can not be done, that is the next best operation for retroversion, but it is not an ideal procedure, because the round ligaments were never intended to hang the uterus upon. We must wait until pregnancy sets in to see whether the uterus will remain in normal position after pregnancy, as it does after Alexander operations.

PUERPERAL ECLAMPSIA.*

T. J. BEATTIE, M.D.

Clinical Professor Gynecology, Kansas City Medical College.
KANSAS CITY, MO.

In selecting this subject for a brief paper I do so because it is a condition that can not be discussed too often. It is only necessary to glance over the literature to satisfy one that the etiology of puerperal eclampsia is still a mooted question. Lever (from the reports of the Guy Hospital, in 1843) was the first to trace any connection between eclamptic attacks and the excretion of albuminous urine. After it became known that the urine of patients suffering from convulsions contained albumin, and they had some of the other symptoms of uremia, it was very generally considered that these patients were suffering from some form of Bright's disease. Frerichs' theory that uremia is caused from the decomposition of retained urea into carbonate of ammonia, and Traube's theory that uremia is produced in hydremic persons by a sudden increased tension of the aorta, and cerebral edema and anemia, were for a time sufficient to explain these attacks of eclampsia; but as more labor was bestowed in investigating the cause, these ideas were considered of very little value. The writings of Rosenstein, Litzman, and Rayer were valuable contributions. Many writers emphasized mechanical interference with the venous circulation in the abdomen; they claimed that the enlarged uterus, in the later months of pregnancy, occasionally caused pressure

obstructing the venous circulation, favoring congestion of the kidneys and the abdominal organs, hence causing obstructive hyperemia of kidneys. Rosenstein was one of the believers in this theory. He says: "The pressure, which under conditions that are not known to us, the enlarged uterus in the later months of pregnancy occasionally exerts upon the vessels of the abdominal organs and especially upon the renal veins, obstructs the circulation of the venous blood; in this way obstructive congestion of the kidneys as well as from other abdominal glands is produced." It would seem strange if there was anything in this theory, that tumors, especially of the fibrous nature, would not cause eclampsia; but they do not.

It has been said that eclampsia was due to pressure exerted upon the ureters, if such were true one would expect to find hydronephrosis, but none has been found in cases where autopsy was held. Many of the clinical aspects of eclampsia are closely associated with the symptoms of uremia, and some investigators were of the opinion that they are identical. In an able article upon this subject, E. P. Davis, of Philadelphia, says: "An effort to positively identify eclampsia with uremia has failed, for many uremics die without eclampsia, and many of the eclamptics do not present the pathological signs of uremia."

Since so much has been done in bacteriology, many investigators naturally turned to some form of germ as a cause of eclampsia. Bacteria have been isolated, which were supposed to be the cause of the eclampsia. Doleris Pouey, and others worked carefully in this line, and were able to say¹ from their investigations: "In all cases in which albuminuric eclampsia was observed the urine contained micro-organisms rendered evident by culture." It has since been studied by pathologists, and the bacteria are not alone in eclampsia, but in pregnant women who are well. When the blood of the eclamptic patient is examined, micro-organisms are rarely found, and from observations one can find no positive proof that any one germ has been isolated which will cause eclampsia.

Frerichs was the first to call special attention to alterations of the blood produced by pregnancy as a cause of eclampsia. It is a known fact that the blood of pregnant women is usually more watery and richer in fibrin than normal. The albumin and red corpuscles are diminished and the white corpuscles more numerous. Frerichs ascribed this impoverishment of maternal blood to drain of nutritive material required for the nourishment and development of the fetus. Some writers claimed some deleterious substance was contained in the blood of pregnant women which was capable of causing disease of the kidneys and at the same time convulsions; these substances have not yet been found.

Chamberlant,² working under the direction of Tannier, in 1892, performed a series of experiments on the blood of eclamptic women, and says: "1. Pregnancy tends to the retention of poisons in the body, for the urine of pregnant women is less poisonous than normal. 2. The albumin of eclampsia is probably secondary, following the direct action of the poison on the renal epithelial cells in the effort of elimination."

I think at present it is the universal opinion among the more modern investigators that eclampsia is due to a profound toxemia, and the origin of this toxemia is still unknown. Some claim it originates from defective

* Read at the Fifty-second Annual Meeting of the American Medical Association, in the Section on Obstetrics and Diseases of Women, and approved for publication by the Executive Committee of the Section: Drs. A. H. Cordier, W. E. B. Davis and Henry J. Newman.

1. American Journal of Medical Science, vol. xc, p. 597, 1885.

2. Northwestern Lancet, November, 1897.