parts smeared with pus; vessels are opened, and the operator cannot see whence the bleeding comes. The latter is especially apt to happen if the infundibulo-pelvic ligament, which is shortened by inflammation, is too strongly pulled upon in order that it may be tied." Each successful colpotomy tempts the operator to further ones; but when there are firm adhesions even of small tumours, it is a difficult, delicate, and hazardous undertaking, and in such cases much more dangerous than abdominal section. Not only death, but hæmorrhage externally (through the vagina), hæmatomata, and pelvic inflammations follow it much more frequently than they do abdominal operations.

Posterior colpotomy has been practised, although not under that name, for many years. Zweifel has long ago opened pelvic hæmatoceles and abcesses by that route. It is possible to remove healthy ovaries in this way, but it is better done by anterior colpotomy. For ovarian cysts, fibroids, and tubal swellings it is not suitable.

The remaining method of vaginal treatment is the extirpation of the uterus. When there is uterine disease that cannot be otherwise cured, this is correct practice. In bilateral disease of the appendages caused by gonorrhœa, Zweifel admits that this indication is complied with. But there are operators who, when they see the anterior surface of the uterus, cannot leave it in the abdomen. It is a horrible thing that a woman should be deprived of her uterus because she has a retroflexion. When the Fallopian tubes are adherent and diseased on both sides, Zweifel regards it as an open question whether the vaginal or the abdominal operation is the better. For himself, he fails to see the advantages of the vaginal operation. He does not think the abdominal operation is attended with greater shock. The risk of ventral hernia he thinks is over-estimated. In a recent paper by **Abel**, its frequency after operations was estimated at 9 per cent. Zweifel thinks this is too high an estimate.

In the discussion on Zweifel's paper, **Sänger** spoke of colpotomy with even less favour than Zweifel. He said he had often had to consider whether he should undertake the removal of diseased parts from below or from above; and he had often thanked God that he had operated from above and not from below. He pointed out that there are limitations to the practicability of vaginal removal of diseased parts, which apply not to the abdominal operation. He endorsed all that had been said by Zweifel and Baum, as to the difficulties and disadvantages of removing inflamed tubes and ovaries by the vagina, even when this is possible. He

did not even admit, with Zweifel, the advantages of removing small ovarian tumours by the vagina; for ovarian tumours giving such trouble that they are discovered while yet small are often dermoids, in the removal of which unexpected difficulty is common. For the removal of fibroids, anterior colpotomy, combined with median incision of the uterus, after the manner of **Doyen**, is certainly of striking utility. But even here, the uterine tissue may be so lacerated, or made friable by contusion, that the closure of the wound may be impracticable, and hysterectomy may have to be performed.

6. Primary cancer of the Fallopian tube.

Hofbauer publishes a case of this rare disease; one which until the last few years was practically unknown (*Arch. für. Gyn.*, Bd. lv.). Hofbauer's patient complained that menstruation had been profuse for three years, and that for one year she had had copious leucorrhœa, pain in the lower abdomen, and wasting. Examination showed that the uterus was fixed, and that there were lumps on each side of and behind it, which could not be distinctly differentiated from it. There was also an ulcer with friable surface in the cervix. Complete extirpation of the uterus and its appendages by the vagina was performed. The parts were adherent. The tubes contained warty, dendritic, and mushroom-shaped friable growths. There was also cancer of the cervix. Microscopic examination showed that the growths in the tubes were "cylindro-epithelial"; in the cervix, squamous epithelioma. Hence Horbauer infers that the disease in the cervix and that in the tubes were not related to one another. This case is the fourth published in which both tubes were affected. Hofbauer thinks that his case supports the opinion of Sänger, that "primary cancer of the Fallopian tube only arises from a basis of chronic salpingitis, which generally has been or is purulent, and has lasted a very long time; and this mostly about the climacteric period."

I cannot follow Hofbauer in thinking that his case supports the theory that chronic salpingitis is the antecedent of cancer of the tubes. The clinical history seems to me explicable on the view that the new growth was the primary change, and the inflammation produced by it.

The after-history of the case is not given.

Roberts (*Obst. Trans.*, vol. xl., 1898) has published a case of primary cancer of the Fallopian tube. The history dated eleven months before operation, and was of repeated attacks of severe abdominal pain, followed by discharge, at first yellow, then watery, and of progressive wasting. "The uterus was displaced to the left by a hard irregular swelling occupying the right fornix, which

seemed more or less closely connected with the uterus, and to occupy the right side of Douglas's pouch. It was almost immovable and painless." The swelling appeared to be about the size of a hen's egg, and was not elastic. The diagnosis made was of pyosalpinx. Mr. Meredith removed the tube by abdominal section. The growth in the tube was a sessile friable papilloma. The tube was fixed by adhesions. There was no ascites. There was no involvement of ovaries, peritoneum, or glands. The patient recovered well, and was in good health ten months afterwards.

Doran has appended to Roberts's paper a bibliography of all the cases hitherto published. The results of treatment are not at present very encouraging; but as the diagnosis has not yet been made before operation, the disease has not been dealt with at an early stage.

7. The axial twisting of the uterus by tumours.

The twisting of the pedicle of an ovarian tumour is a not uncommon event, and its consequences are well understood. Twisting of the uterus by a tumour is much rarer. It is the subject of papers by **Schultze** (*Zeit. für Geb. und Gyn.*, Bd. xxxviii.) and **Frommel** (*Cent. für Gyn*, 1898, No. 22). Schultze has collected 32 cases—5 of his own, 27 reported by others. In 15 the uterus was twisted by a tumour growing from it, in 17 by an ovarian tumour. Schultze's first cases refute a current misstatement. It has been said that by the torsion of a tumour the body of the uterus may become separated from the cervix, and three cases have been quoted in support of this assertion. Schultze quotes the original records of these three cases, and shows that in not one of them was it the case that the body of the uterus was detached from the cervix. Although he has only been able to get together 32 cases, yet Schultze thinks that torsion of the uterus by tumours is not so uncommon as might be inferred from the paucity of published cases. Of the fifteen fibroids which caused torsion of the uterus, five were stalked and grew from the fundus, the stalk itself being in no case twisted, four were sessile, and four interstitial. [Information is lacking as to the remaining two.] Of the ovarian tumours, nine had twisted pedicles, six not. All the women had had children; whence Schultze concludes that the incidents of childbearing must produce conditions favourable to torsion. He discusses, too elaborately for quotation here, the mechanism by which a tumour may come to twist the uterus. The symptoms which attend axial twisting of the uterus are, according to Schultze, very difficult to distinguish from those directly produced by the tumours themselves, independently of pedicle twisting. They differ exceedingly in different cases. One patient, in whom

the uterus was twisted $4 \times 180°$, died from pulmonary embolism, peritonitis and hæmorrhage into ovaries and tubes being found on *post-mortem* examination. In another, the uterus was twisted to the same extent, but there were no acute symptoms, no inflammation, but only a cavity in the middle of the tumour containing broken-down tissue and reddish fluid. A fibroid in which there are symptoms caused by torsion of the uterus cannot at present be distinguished from an ovarian tumour with a twisted pedicle. Frommel republishes two cases, which have already been published in a journal of so limited a circulation that they escaped notice. In one case there was a cysto-myoma with enormous extravasation of blood into it, and venous hyperæmia. Frommel attributed these changes to the torsion for a quarter circle of the uterus, which was so twisted that the left ovary looked forwards, the latter backwards. In the other case there was ascites and old and recent extravasations of blood into the tumour. The uterus was so twisted that the left ovary looked backwards and to the right, the right backwards and to the left. Frommel regards these cases as showing that torsion of the uterus produces effects analogous to those of twisting of an ovarian pedicle.

8. Senile endometritis.

Halliday Croom (*Edinburgh Med. Journal*, April, 1898) records three cases of this rare disease. The name he prefers is "senile uterine catarrh." One of his patients was cured by applications of carbolic acid on a dressed probe; the others by curetting and packing with gauze. He distinguishes three forms of the disease: (1) those with fœtid discharge and no hæmorrhage; (2) those with leucorrhœa and slight hæmorrhage; (3) those in which hæmorrhage is the main, if not the only symptom. He points out the close resemblance of the symptoms to those of cancer of the body of the uterus, and the fact that the disease is often accompanied by cachexia like that of cancer. [He might with advantage have quoted Duncan's case, in which the cachexia advanced until the patient died, and on *post-mortem* examination no morbid change other than endometritis was found.] He points out that the diagnosis is quickly made by the result of treatment. If the disease is endometritis, improvement follows a week or two after treatment, but not so cancer. He thinks offensive discharge commoner in endometritis than in the early stages of cancer, and that the pain is so much more severe in cancer of the body that its character will help in diagnosis. Croom does not believe that endometritis tends to become malignant. He has never seen the disease become cancer. He recommends, besides curetting, the

internal administration of arsenic, strophanthus, and Chian turpentine.

Rosenwasser, in a paper entitled "Post-climacteric Conditions that simulate Advanced Uterine Cancer" (*Annals of Gynecology and Pediatry*, October, 1897), has well discussed the diagnosis of "atrophic, senile, or post-climacteric endometritis," and brought together reports of six cases, all of them quickly cured by dilatation of the cervix and curetting. He remarks: "It is generally conceded that tissues under chronic irritation, especially epithelial tissues, are liable to malignant degeneration. The records do not seem to corroborate this theory in patients subject to post-climacteric endometritis." Rosenwasser appends a bibliography to his paper.

Two questions are suggested by Rosenwasser's paper: (1) Does senile endometritis ever become malignant? This question cannot yet be answered. The other question is, Can early malignant disease of the body of the uterus always be distinguished from catarrhal endometritis? There are cases in which it is not possible to say whether or not the disease is malignant, in which there are no polypoid growths to be scraped off and examined; and even if there were, the microscope may be inconclusive. Therefore I think that, if a case of what appears to be senile endometritis is not quickly cured by intra-uterine treatment, the sooner the uterus is removed the better.

9. Steam in uterine therapeutics.

It is, I take it, a function of the "Year-Book of Treatment" to introduce novel therapeutic proposals to its readers, even though the desirability of closer acquaintance may seem uncertain. **Pincus** (*Cent. für Gyn.*, No. 10, 1898) has displayed much ingenuity in devising an apparatus by which a jet of steam can be injected into the uterine cavity. He modestly minimises his own merit, for he says that he was induced to take up the subject by **Snegirjoff's** communication on the arrest of hæmorrhage by steam. Pincus calls his instrument a "vaporisator." He claims that it is easy to work, and that it gives complete protection against burning of the vagina or the vulva. Burning of the cervix can be prevented by wrapping gauze round the instrument. He says that the operation is almost painless, and can be performed without anæsthesia. The apparatus consists of a kettle, strong enough to hold superheated steam at a temperature of 125° C. (257° F.), and provided with a safety valve lest that pressure should be exceeded, and a thermometer to show the temperature. The steam is conducted from the boiler by an indiarubber tube, strengthened with spiral wire, to a catheter. All connections are absolutely steam-tight. At the end of the

catheter are either three longitudinal fenestræ or a sort of trellis of openings, extending about two inches from the point. By this instrument steam is delivered into the uterine cavity. Pincus has also designed two other instruments. In one the steam is delivered into a hollow sound, which it heats; and in the other into the blade of a knife-shaped instrument. In each instrument a tube is provided for the escape of the steam after it has been used. To these instruments the inventor applies the name "vapocauter." To use the vaporisator, the boiler is heated until the steam within shows a temperature of 110° C. (230° F.). Then the lamp is withdrawn and the catheter put into the uterus. When it is in position, the lamp is reapplied to the boiler, and when the steam has regained the wished-for temperature (Pincus has worked with a temperature of 110°), the stopcock is turned and a jet of steam let into the uterus. From half a minute to a minute is enough.

Pincus finds this treatment especially good in climacteric hæmorrhages and post-climacteric leucorrhœa. It is also beneficial in endometritis, hyperplastic and other. It is contra-indicated by tubal disease, rigidity of the cervix, submucous or polypoid myomata.

Superheated steam probably has much the same effect upon the tissues as the actual cautery, but a jet of steam would attack every part of the uterine cavity, while the cautery might leave some small spots unvisited.

In a subsequent paper (*ibid.*, No. 22), Pincus reiterates his opinions of the value of this treatment in climacteric hæmorrhages, and in the early stage of infectious puerperal endometritis. He adds some cautions as to its application: (1) The protection of the cervix with gauze is necessary if the steam is used for longer than half a minute. (2) If the operation is repeated, it should not be till complete regeneration of the mucous membrane has taken place. The steam may be applied for one minute without stricture resulting. (3) The cervix should be held in position with forceps, the blades of which can be separated for cleaning and sterilisation. This is very important. Lastly, he describes some improvements in the instrument.

Fenomenow, Director of the Gynæcological Clinic at Kasan, (*ibid.*, No. 23) in a paper entitled "The Technique of Intraperitoneal Operations of the Uterus," calls attention to the familiar fact that many intraperitoneal operations, especially those in which the uterine cavity is opened, do badly because the peritoneum becomes infected from the uterus. Many ways of disinfecting the uterine cavity have been tried with varying

success. Fenomenow now prefers disinfection by steam, as recommended by **Snegirew**. He has used this agent with satisfactory results in putrid endometritis following abortion, and in two cases of fistulæ following operations, for ectopic pregnancy and pyosalpinx respectively. One had existed many years and healed quickly after steam cauterisation. Therefore he says that before undertaking an intraperitoneal operation in which the uterine cavity is likely to be opened, the inside of the uterus should be steamed. It may be done without anæsthesia. He applies the steam for from 45 to 60 seconds. That the application of steam to the inside of the uterus may do more than is expected, is shown by a communication from **Otto v. Weiss** (*Cent. für Gyn.*, 1898, No. 24). He quotes a case, published by **Baruch**, in which atrophy of the uterus followed the use of steam as a remedy against hæmorrhage. The bleeding stopped, the menses never returned, climacteric symptoms came on, and eighteen months afterwards the womb was found small and hard, and the cervical canal impassable. He relates a case of his own, that of a girl aged nineteen, into whose uterus a jet of steam was sent to arrest hæmorrhage, with the final result of obliterating the cervical canal. Pincus admits having had one case of cervical stenosis following steaming.

10. Some points in the technique of hysterectomy.

Fenomenow, in the remainder of the paper quoted above, makes some suggestions as to the ligature of the uterine arteries, which may prove useful.

He seizes the uterus with a strong volsella and pulls it up, and then ties the uterine and ovarian arteries. The ligature of the latter is easy. The uterine artery springs from the hypogastric about an inch and a half below the level of the pelvic brim. In its course it crosses the ureter, which lies below and behind it. Outside the ureter the artery lies for 3 or 4 centimetres in loose connective tissue at the base of the broad ligament. About 1½ centimetre internal to the ureter, the artery sends a branch down to the vaginal portion and vagina, and then runs to the side of the uterus. The artery may be tied at one of three places: (1) between its origin and its crossing the ureter; (2) between its crossing the ureter and its sending off the branch to the vaginal portion; (3) close to the uterus after it has given off the vaginal branch. The common way of securing the vessel is by the ligature *en masse*. Fenomenow disapproves this. He prefers the method devised by **Altnchoff** and **Snegirew**, of tying the vessel near its origin. The method is as follows: The abdomen having been opened, the round ligament is pulled forwards. An incision is made through the anterior layer of the broad ligament, about a centimetre from the linea innominata, and carried towards the middle line for about 3 centimetres. This exposes the connective tissue of the ligament. About half or three quarters of an inch deep the vessel will be found, and can here be ligatured without risk of including the ureter. Pulling the round ligament forward pulls forward the anterior layer of the broad ligament, and with it the vessel, while the ureter remains behind. This operation, Fenomenow says, is difficult and takes a long time, especially in complicated cases. He prefers, instead of simply drawing the round ligament forward, to cut through it, which involves an incision in the anterior fold of the broad ligament. The proximal end of the ligament is tied and then the incision in the broad ligament carried outwards, the peritoneum fold being lifted forwards by pulling on the distal end of the round ligament. By manipulating deeply enough, the uterine vessels, which in cases of neoplasms are enlarged, can easily be felt. If the veins are compressed so as to empty them, the artery can be seen. When identified, the artery can be easily tied either inside or outside the ureter, and the operator should not go deeply enough to endanger the ureter. If the whole uterus, including the cervix, is to be removed, it is better to tie the artery outside the ureter. The same rule applies to removal of the uterus by the abdomen for malignant disease. Fenomenow does not advocate removal of the whole uterus for myomata, for he thinks that amputation of the body above the cervix is enough. He concludes his paper with some remarks on the great help in the operation that is given if the uterus is pulled or pushed up. An elevation of even a few centimetres is a great assistance. The uterus may be pushed up with a water bag in the vagina. Here he adds a caution by relating a case in which, by such a bag used for this purpose, the vagina was ruptured. He regards this rupture as due to a condition of the vagina special to that patient, one not likely to be often met with.

11. The treatment of cancer of the cervix uteri in the later months of pregnancy.

This is the subject of two thoughtful papers by **Fritsch** and by **Mittermaier** (*Cent. für Gyn.*, No. 1, 1898). Many cases have in recent times been published in which the pregnant uterus, with its cancerous cervix, has been removed entire. Fritsch has himself successfully performed two such operations. Concerning the propriety of this operation, he remarks that it is a right difficult, bloody, tedious, and extensive operation. It presents one surgical impropriety, that in his dealing with the

cancer the operator is working in the dark. He can only ascertain by touch whether he is cutting through healthy tissue. In both Fritsch's cases relapse soon took place. "Technique triumphed," he says, "but the patients died within a year." He had thought that the vaginal extirpation of the puerperal uterus would be a difficult operation; but he found that it is not. The puerperal uterus can be so easily dragged down to the vulva that the operator can do without a speculum; the adjoining parts can be distinguished from the uterus more easily than in the unimpregnated state, and the ligature of the vessels performed almost at the vulva. Bleeding is slight.

Fritsch's conclusion is that the complete abdominal extirpation of the pregnant uterus when affected with cancer of the cervix ought not again to be done; nor should the uterus be emptied by Cæsarean section or Porro's operation, and then the cervix removed from below. The proper treatment is to remove with the sharp spoon as much of the cancer as possible, so as to minimise obstruction to delivery; then to deliver with forceps or in any other way that the peculiarities of the case call for; lastly to deliver the placenta. After this has all been done, then to remove the whole uterus by the vagina.

Fritsch adds, as a kind of *obiter dictum*, that in rupture of the uterus the vaginal removal of the damaged organ will be found the best treatment. Bleeding will thus be controlled, free drainage is secured, and as the bladder is pulled up during labour, the ureter will be out of the way of injury.

Mittermaier remarks that it is the generally accepted view that, in cancer of the puerperal uterus which is still operable, the best course is to await involution before proceeding to extirpation of the uterus. He holds that, in the light of our present knowledge, this is no longer sound practice, but that in cancer of the puerperal uterus removable by operation, the operation should be done as soon as possible after delivery. In cancer affecting the uterus five or six months pregnant, the membranes should be punctured, and the uterus, thus diminished in size, extirpated by the vagina. If the pregnancy has advanced to the sixth or seventh month, the uterus should be emptied by splitting up the cervix, and then removed by the vagina. Mittermaier relates two cases, one in which the patient spontaneously aborted in the sixth month of pregnancy, and he removed the uterus next day; another in which a woman with cancer of the cervix was seven months pregnant, and he first emptied and then removed the uterus by the vagina, getting at the uterus by splitting up its anterior wall, and delivering the child alive. In each case the operation was easy,

the vascularity of the parts allowing the uterus to be pulled far down.

In a later number of the same journal (*Cent. für Gyn.*, No. 5, 1898) **Seiffart** relates a case in which he delivered a woman who had cancer of the cervix and was nine months pregnant, by vaginal Cæsarean section—that is, enlargement of the os uteri by incision—and afterwards extirpated the uterus by the vagina. The child was born still, but was soon revived by artificial respiration. The patient died on the following evening.

12. The operative treatment of prolapsus.

Sänger (*Cent. für Gyn.*, 1898, No. 2) has written down his opinions on this question. His reason for doing so is that the multiple methods of treatment now before the profession render choice difficult. Not only are plastic operations performed, but hysteropexy, cystopexy, and total extirpation of the uterus. Plastic operations have been undervalued because the operations done were so small and insufficient. Sänger says that a good plastic operation is more difficult than an abdominal section, and requires time, patience, and rigorous antisepsis. The true aim of a plastic operation is to bring the uterus back as nearly as possible to its normal position. Sänger holds that the great majority of cases of prolapse, the exceptions being few, can be cured by means of plastic operations. Great help is given by amputating high up the thickened, lengthened and hypertrophied cervix. This is far more useful, in Sänger's opinion, than Alexander's operation. In certain exceptional cases he employs it in conjunction with ventral fixation, doing the two operations at one sitting.

Sänger performs anterior colporrhaphy and colpo-perineorrhaphy according to a method of his own. In the paper I am quoting from, he describes this at great length, emphasises the points in which it differs from that employed by others, and vindicates his own priority. Space does not allow me to follow him in the details of his operation. I can only indicate its main features and refer those interested in it to Sänger's paper. Sänger, instead of dissecting flaps up in the ordinary way, makes a median incision in the anterior and posterior vaginal walls, seizes the mucous membrane on each side of this incision with pressure forceps, and then separates, mainly with a blunt instrument, the mucous membrane of the vagina from the rectum behind and the bladder in front. The knife or scissors may be wanted at the lower part, where the connection is closest. In this way he gets two flaps of mucous membrane extending from the vulva to the cervic uteri, separated from the tissue beneath "like gigantic butterfly's wings," he says. In addition to this operation on the

posterior vaginal wall, he denudes the vulva laterally, so that the hinder raw surface comes to be the shape of an anchor. The raised flaps of mucous membrane are then fully cut away, and the edges left brought together by transverse sutures. In this way a narrowing of the vagina throughout its whole length, as well as a contraction of the vulval orifice, is effected.

Sänger is not able to give a numerical statement of the final results in the cases thus operated upon. He confines himself to saying that he has had very few relapses. When anterior colporrhaphy is done without posterior colpo-perineorrhaphy, relapse is the rule. In two cases, Sänger has performed ventral fixation in addition to the operation described above. He has never extirpated the uterus for prolapse.

13. Vaginal shortening of the round ligaments.

The different ways of treating retroflexion surgically have each their disadvantages. Ventral fixation leaves an abdominal scar; Alexander's operation leaves two inguinal scars; vaginal fixation is said to give trouble should pregnancy follow. This is **Bode's** (*Arch. für Gyn.*, Bd. lvi.) reason for practising and recommending the shortening of the round ligaments by the vagina He performs the operation as follows:—The cervix is held down with a volsella. A transverse incision is made through the anterior vaginal wall, the bladder and ureters are separated from the uterus, and the vesico-uterine peritoneum is opened. Then the cervix uteri is pressed backwards, and the finger put in and hooked over the uterine end of the round ligament. This is brought into view, seized with forceps, and a silk ligature is passed through it at about 1 cm. from its uterine attachment, and tied. By means of this ligature the ligament can be drawn down and brought into view for nearly its whole length. The same thing is done on the other side. When these ligatures are pulled upon, the body of the uterus comes forward. The ligature is next passed through the ligament in a direction from the middle line outwards, so that its end may emerge 5, 6, 7, or 8 cm. farther from the uterus. The ligature is held in a forceps while a similar ligature is being put in on the opposite side. Then the ligatures are tied, thus shortening the ligaments and pulling the uterine body forwards. If the position of the uterus is found satisfactory, the ends of the ligature are cut short. If not, the ligature is again passed through the ligament still farther from the uterus, and thus still further shortening produced. When sufficient shortening has been effected, the ligature is cut short, the opening in the vesico-uterine peritoneum closed with catgut, and the vaginal wound also sutured.

Bode has found this operation successful in keeping the uterus in a proper position. He reports twelve cases; but with one exception, other treatment besides shortening the wound ligaments was employed; curetting; removal of a cystic ovary; perineorrhaphy; double salpingo-oöphorectomy; partial amputation of cervix. In three, adhesions were present, which had to be broken down before the uterus could be got into a normal position, and one of these patients died. In half of them, not only were the round ligaments shortened, but they were stitched to the vesical border of the vesico-uterine peritoneum. These complicating circumstances make it impossible to judge from Bode's cases of the therapeutical value of the operation. But as an ingenious and novel mode of correcting backward displacements of the uterus, I think it worth quoting. I do not see its superiority to vaginal fixation of the uterus, the objections to which are not to my mind so solidly established as Dr. Bode seems to think.

14. The sterilisation of women.

In cases of extreme pelvic contraction, it has often been thought desirable to sterilise women so as to guard them from the exceptional risk of another pregnancy. **Rühl** (*Central. für Gyn.*, No. 8, 1898) discusses this question. In order to sterilise patients, the Fallopian tubes have been tied and divided, and pieces have been cut out of them. But cases have been reported in which after ligature, division, and partial removal of the tubes, pregnancy has taken place. These measures are therefore not to be relied upon. Rühl holds that there is a further objection: that the occurrence of ectopic pregnancy is favoured. He quotes a singular case by **Wendeler**, in which, after complete extirpation of the uterus, pregnancy occurred in the tube which had been left behind. Rühl's own proposal is to suture the ends of the Fallopian tubes in the anterior vaginal wall. This will absolutely prevent either uterine or ectopic pregnancy.

Kossmann (*Cent. für Gyn.*, No. 14, 1898) takes up the question. He has sought to sterilise patients by ligaturing the tube in two places, and dividing it between the ligatures with the thermo-cautery. He says that if the tube is cut through with knife or scissors, the mucous membrane at the line of section projects, and in healing unites with the peritoneum, forming an open funnel, capable of receiving either ovum or spermatozoon. Hence, even cutting a piece out of the tube cannot be relied upon if done with a sharp instrument.

Neumann (*Cent. für Gyn.*, No. 24, 1898) distrusts even the proceeding of Kossmann. He thinks the difference between division with the knife and with the thermo-cautery is not so great as Kossmann thinks. His proposal is to cut a wedge-shaped piece out

of each corner of the uterus, and sew the cut surfaces together with a continuous catgut suture. Then to bring the ends of the tubes up to the abdominal wall, and suture them into the wound.

15. The transplantation of ovaries.

The consequences of double oöphorectomy sometimes so gravely affect the happiness of women's lives that attention has been directed to the possibility of supplying to the organism that of which it was deprived when the ovaries were removed. The simplest and easiest way is by giving ovarian tissue or ovarian extract by the mouth. **Muret** (*Revue Médicale de la Suisse Romande*, No. 7, 1896) has carefully observed the course of cases while taking it, and has collected similar observations by others. They come to this—that ovarian extract certainly does no harm, and in some cases improvement in symptoms has followed its use. But the improvement is not so constant, nor are the results in different cases so similar, as to warrant any definite conclusion as to the therapeutical value of ovarian extract.

The ovaries do not pour their secretion into the alimentary canal, and therefore it may cogently be said that putting ovarian extract into the stomach is not supplying the organism with ovarian secretion. Experiments have been made in the transplantation of ovaries. **Knauer** (*Cent. für Gyn.*, No. 8, 1898) has operated upon hares, by opening the abdomen, removing the ovaries, and transplanting them to another part of the peritoneum. He reports a case in which, sixteen months after this proceeding, the animal was delivered at the full term of pregnancy. **Grigorieff** had previously observed pregnancy following this operation. **Morris** (*New York Med. Journal*, 1895) has transplanted ovaries in the human subject. In one case, that of a patient aged twenty, with an infantile uterus, who had never menstruated, he grafted a piece of ovary from another patient on to the fundus uteri, with the result that the patient menstruated. In another, a patient aged twenty-six, from whom the uterine appendages had been removed on both sides, he grafted a piece of ovary into the stump of a Fallopian tube, with the result that the patient became pregnant, but aborted.

These observations show that it is in the surgeon's power to do more for patients whose ovaries are absent or ill-developed than has hitherto been thought possible.

There are considerations which men and women have to think of that are unimportant in the case of animals. Would a woman regard as her own a child conceived by the help of someone else's ovary? If the transplantation of ovaries proved a success, whence would healthy ovaries be got in sufficient number? Pregnancy

after transplantation of an ovary might be avoided by grafting the ovary outside the peritoneum, but would this have the same effect?

I can see no objection to the transplantation of ovaries *per se* that does not also apply to transfusion of blood, and in less degree to vaccination. But the possibility of subsequent pregnancy introduces the curious social questions that I have hinted at.

Frank (*Centralblatt für Gyn.*, 1898, No. 17) thinks that, if it is necessary to remove both ovaries, the uterus and tubes should also be taken away; for the uterus is no use without the ovaries, but only a source of disturbance. If the uterus is not removed, a bit of ovarian tissue should be left behind, in such a manner that pregnancy may be possible. He thinks that, notwithstanding the frequency of disease of the uterine appendages, cases in which the ovaries ought to be removed are rare. In most cases a bit of ovary can be left without disturbing recovery. He recommends that a bit of the hilum ovarii be left, and stitched in the ampulla of the tube; or, if the greater part of the tube has to be removed, the stump of the tube should be slit up, and the piece of ovary sewn into it. If the tube has to be cut out of the uterine cornu, then the bit of ovary should be sewn into the wound. He relates three cases—two of double pyosalpinx, one of hydrosalpinx—in which he acted on these principles. All of them menstruated regularly after the operation; two became pregnant, one of whom went to full term, and in the third there was probably ectopic pregnancy.

16. Ignipuncture of painful ovaries.

In last year's "Year-Book" I quoted Pozzi's paper on the ignipuncture of painful ovaries. I then said that I thought this operation promised to be a distinct addition to our therapeutic resources, for that I had in several cases performed it, and that the patients afterwards said they were better. I have now to add that this benefit proved only temporary, and that as a means of relieving ovarian pain this operation seems to me practically useless. If small cysts are met with, I think it better to excise a wedge-shaped piece of the ovary so as to include them, and sew the cut surfaces of the ovary together, than to destroy cysts with the cautery. This will at least cure incipient cystic disease. Whether it will permanently remove pain I know not as yet.