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ARTICLE I.

THE TOTAL EXTIRPATION OF THE UTERUS THROUGH THE VAGINA.¹
By CHRISTIAN FENGER, M.D., of Chicago, Illinois.

THIS important operation is one of the latest conquests of modern, that is to say, antiseptic surgery, and, for the right to carry out this operation into practical life, we are indebted to Czerny, Schröder, Billroth, and Mikulicz. This is another illustration of the old saying that "there is nothing new under the sun," as total extirpation of the uterus was not only thought of, but performed, as far back as 100 A. D., by Soranos, and in the course of the following centuries, was occasionally performed in cases where a prolapse of the organ made the extirpation both imperatively indicated and reasonably practicable in conformity with the status of surgery at that time.²

¹ Read before the Chicago Medical Society, November 7, 1881.

² The first extirpation in this century of the prolapsed uterus was made by K. M. Langenbeck, for cancer, in 1813. The patient recovered, and the case was for many years the occasion of unjust doubt and criticism in the literature, until finally, thirty years after, the autopsy showed that the operation had been complete. It was Langenbeck's description of his operation that led Czerny to extirpate a non-prolapsed uterus through the vagina. It is needless to state that the extirpation of a prolapsed uterus is much easier and in reality an entirely different operation from that which we are now considering, because not only the fundus uteri but also the broad ligaments and ovaries are usually outside of the vulva and within easy reach of the operator. Consequently, there is no great technical difficulty in the operation.

A recent case of the extirpation of a prolapsed uterus was reported in 1880 by Dr. John C. Blake (*Boston Medical and Surgical Journal*, April 14, 1881) in which no cancer was demonstrated. His method of operation is rather difficult to comprehend, and his ligature *en masse* of the whole amount of tissue above what he calls the "fundus," but which probably was the cervix, is so primitive a procedure that I should deem it hardly permissible at the present time. The patient died twelve hours after the operation. The cause of death was unknown, as no autopsy was made.

But it was not until the commencement of the present century, with its numerous and fruitful impulses in the direction of methodical and scientific progress in our science, that any serious attention was directed to this subject. Mikulicz, in his interesting monograph on this subject,¹ states that a prize was offered by the Josef's Academie of Vienna, for the best essay on this subject, and the prize was awarded in 1814 to Gutberlet, who proposed a method of extirpation by abdominal section, which resembled in its main features Freund's method, and was performed sporadically several times in later years, and then fell into disuse, until Freund, half a decade ago, by the aid of the antiseptic method, again brought it systematically before the profession.

The prognosis of this abdominal operation in the course of a few years was shown to be so unfavourable that Ahlfeld's statistics, founded on not less than 66 cases, showed a mortality of 49, that is, 74 per cent., caused by the operation itself; 4 operations had to be abandoned, and only 13 patients, or about 20 per cent., recovered. It was natural that an operation so dangerous in itself, if not entirely abandoned, would at least lead the profession to consider very seriously the question of the attainment of the same end by a safer method of operation.

The total extirpation of the uterus through the vagina had previously been performed in isolated cases. In all probability the first operation of this kind was performed by Sauter in 1822, from which the patient recovered, notwithstanding the opening of the bladder. Récamier operated in 1829 in one case with good results, and, after him, several others, but usually with fatal results. The operation was consequently abandoned until Czerny reintroduced it with one successful case in 1879.² The first successful case was speedily followed up by Billroth and Mikulicz in Vienna and Schröder in Berlin. To the latter we are indebted for our knowledge of the comparative safety of the operation, as in 1881 he issued a most brilliant statistical report³ of eight operations with seven recoveries and only one death, which was not caused by peritonitis or septicæmia, but from a probably unavoidable internal hemorrhage from a ruptured vessel in one of the broad ligaments.

The operations reported in the literature accessible to me up to the time of my operation were the following :—

¹ Wiener Medizinische Wochenschrift, 1880, No. 47 *et seq.*

² *Ibid.*, No. 45, 1879, p. 1172; Ueber die Ausrottung des Gebärmutterkrebses.

³ Zeitschrift für Geburtshülfe und Gynäkologie, Band vi. Heft 7, 1881, page 226.

Operator.	Cases.	Recoveries.	Deaths.	Unfinished operations.
Czerny	2	2	0	0
Billroth	7	4	3	0
Schröder	8	7	1	0
Merike ¹	1	1	0	0
Tarsini ²	1	1	0	0
Martin ³	12	6	3	3
Ohlshauser ⁴	6	6	0	0
Bauer	4	2	2	0
Lane	1	1	0	0
Kaltenbach	1	1	0	0
Bompiani	1	0	1	0
Bardenheuer	1	0	1	0
Totals	45	31	11	3

As it will be seen from the above tabular statement, 69 per cent. of those operated upon recovered, 24 per cent. died, and in 7 per cent. of the cases the operation was unfinished. Taking into consideration that the statistics, although from a relatively small number of operations, still showed such unexpectedly favourable results from a new and almost untried method, I did not hesitate, after careful investigations upon the cadaver, to resort to the operation in the following case:—

CASE. Mixed Cylindrical and Multiform Celled Carcinoma of the Cervix and lower half of the Fundus of the Uterus, of over Eight Months' Standing.—Enlargement of the fundus—No tangible infiltration of the broad ligaments, bladder, rectum, or vagina—Total extirpation through the vagina—Opening of the bladder—Permanent irrigation—Slight transient cystitis—Slight rise in temperature for two weeks—Temporary vesico-vaginal fistula, which closed spontaneously after four weeks—Complete recovery from the operation.—Mrs. H., forty years of age, parents still living and healthy. No consumption or cancer in the family. She has always been spare, but otherwise healthy. Menstruation commenced at fifteen, and has always been regular. She was married at eighteen, and has had nine children. Delivery was always easily accomplished, without the aid of forceps. Of the nine children, the first two died when eighteen months old, and the fifth when two years old, from diphtheria.

Eighteen months previous to the operation she became pregnant, until which time her menses were regular. Towards the end of pregnancy, however, she felt more tired and weak than had been usual when in this condition, and, when standing, she would have a feeling of bearing down or pressure in the lower part of the pelvis, which was of a more distressing character than that experienced during any of her former pregnancies. There was never any hemorrhage, but often considerable pain, irradiating from the pelvis down the left leg.

In due time, nine months previous to the operation, she was delivered, and, during the act of delivery, noticed a peculiar cutting character of

¹ Zeitschrift für Geburtshilfe und Gynäkologie, B. 6, H. 2, 1881, p. 415; Bericht über die Verhandlungen der Gesellschaft für Geburtshilfe und Gynäkologie, zu Berlin.

² Gazzetta Medica Italiana Lombardia, No. 15, 1881.

³ Centralblatt für Gynäkologie, No. 8, 1881, p. 189.

⁴ Berliner Klinische Wochenschrift, No. 35, 1881. Ueber, Total extirpation des uterus nach 10 eigenen fallen.

the pains, which she had not experienced in former confinements, and the after-pains, during childbed, which lasted for nine days, were, she noticed, of a similar character. There was less hemorrhage than usual during this time. When she got up she experienced a sensation as if something heavy had been left in the pelvis, and, a few weeks later, when she had recovered her usual strength, she felt pulsation, dull pain, and bearing down, giving her the idea that something was not as it should be. The midwife who attended her told the relatives that while exploring during the delivery, she had felt something unusual, like a hard lump.

Nine weeks later, a slight hemorrhage set in, which continued more or less up to the time of operation, and which occurred in the following way: Every two or three days she would have bearing-down pains, and a sensation as if something turned around, and then suddenly a quantity of blood would be discharged at once, after which there would be no hemorrhage for a couple of days, when the same series of symptoms would recur. The quantity of blood discharged increased slowly but gradually from month to month, until in July, 1881, the hemorrhages became so severe and the intervals so short that she was obliged to remain in bed for three weeks. During this time she made use of some medicine internally, and the hemorrhage ceased, but returned when she got out of bed. In the latter part of August and September the hemorrhages were less severe, but would still recur every two or three days, accompanied by the usual symptoms.

During the whole summer of 1881 she lost strength, her appetite became poor, and her condition more and more anæmic. August 14, I was called to see her, in consultation with Dr. Mead. The examination showed the following condition. The patient was pale, thin, of medium height, weight about one hundred and thirty pounds; lips and conjunctiva pale; lungs and heart normal; the abdominal walls somewhat flabby, but palpation and percussion normal. Vaginal examination revealed considerable enlargement of the vaginal portion of the uterus; the external os was sufficiently large to admit the end of the finger, and hard, irregular, and nodulated to the touch. In the anterior and posterior lacunæ no isolated tumours could be felt. Combined external and internal examination showed the uterus to be movable and the fundus somewhat enlarged, but not particularly tender. There was no enlargement of the ovaries, and no hardness or thickening or nodulated condition of either of the broad ligaments, but palpation of the broad ligament on the right side, with deep pressure, caused her some pain. Combined vaginal and rectal examination revealed no thickening of the recto-vaginal tissues anywhere, and palpation of the bladder through the anterior lacuna did not reveal any hardened tissue outside of the thickened vaginal portion. After the introduction of Sims's speculum, the vagina was found to be filled with blood, after the removal of which, the vaginal portion of the uterus was seen to be enlarged to a large tumour of about one and one half inches in diameter. The external os formed a funnel-shaped cavity one centimetre deep and one and one-half centimetres in diameter, presenting an excavated, irregular, cancerous ulcer, partly covered with discoloured grayish-white, necrotic tissue, partly with grayish-red tissue, from which a considerable hemorrhage was steadily going on. The remainder of the vaginal portion had a whitish, somewhat nodular appearance, but was covered all over with healthy mucous membrane; in the posterior and anterior lacunæ as well as in the rest of the vagina, the mucous membrane

was normal, and no isolated cancerous tumours were to be seen anywhere. The uterine probe showed the uterine canal somewhat enlarged and about four inches in length. A piece of the vaginal portion was removed from the border of the ulcer, for microscopical examination. The urine was dark coloured, clear, acid, and contained neither albumen, sugar, nor blood, and no cellular elements of any kind.

Microscopical examination of the hardened piece of excised tissue showed epithelial carcinoma, with large irregularly shaped alveoli, wholly or partly clad with a single or double layer of cylindrical epithelial cells, and filled and partly clad with large multiform epithelial cells with large oval nuclei.

Diagnosis.—Epithelial carcinoma with preponderating cylindrical epithelial cells, originating in the mucous membrane of the cervix uteri, involving the whole of the tissues of the cervix and probably extending high up in the cavity of the uterus. No extension of the carcinoma either into the rectum or bladder, or, to any palpable degree, into the broad ligaments.

The following plan for an operation was proposed and accepted. Everything was to be prepared for the total extirpation of the uterus through the vagina; the operation to be commenced with a view of making a supra-vaginal amputation only, if this procedure would enable me to remove the whole of the diseased tissue. But if this proved insufficient, the total extirpation of the organ should be immediately performed.

As the patient stated that at regular intervals she had sensations, though indistinct, similar to those during her menses in former times, but which still were distinct enough to enable her to differentiate between such a period of hemorrhage and the continuous hemorrhage described above, I resolved to wait for two weeks until one of these periods should be just over, before proceeding to operate, as in one of Schröder's cases, considerable pain and distress had occurred during the after-treatment of an extirpation, just at the time at which the patient expected her menses to set in.

In the second week of September, the patient stated that the hemorrhage was accompanied by the usual sensations of the period, which terminated about the fifteenth of the month, and consequently, the nineteenth was fixed upon as the day of operation. During this interval of four days, the following preparatory treatment was enacted: The patient was kept in bed most of the time; kept on liquid diet; the bowels were moved every day, by the use of compound licorice powder at bedtime; and the vagina was washed out twice a day with three per cent. solution of carbolic acid, which sometimes caused slight burning sensations in the vulva.

Operation.—On September 19, assisted by Drs. S. D. Jacobson and E. W. Lee, of the staff of Cook County Hospital; Dr. Truman W. Miller, of the United States Marine Hospital Service; Dr. J. B. Murphy of Chicago; Dr. Bradley, House Surgeon, and Dr. Kendall, Interne of Cook County Hospital, I operated in the following manner:—

The patient was anæsthetized with ether by Dr. Kendall; placed in the lithotomy position on a table immediately opposite a window, through which the sunlight would thoroughly illuminate the field of operation. Dr. Lee, standing on the left side of the patient, made compression of the abdominal aorta. Drs. Jacobson and Miller, on the right and left side of the patient, held the femora, and each held also a Simon's speculum in the vagina. Dr. Murphy, at my right hand, had charge of the carbolized

sponges for cleansing the field of operation, and Dr. Bradley, at my left hand, had charge of the instruments.

By means of a strong vulsellum forceps, the vaginal portion of the uterus was drawn down towards the vulva, but the cancerous tissue in which it was inserted, was so friable that the forceps tore through several times, and only a moderate degree of force and traction could be employed. By means of a slightly-curved scissors, a circular incision was made through the vaginal mucous membrane, at the upper circumference of the vaginal portion, about one and one-half centimetres from the ulcerated surface of the os. The loose, submucous connective tissue was separated with blunt instruments, so as to detach the bladder and rectum from the tumefied neck of the uterus. In detaching the posterior wall of the bladder from the latter, it was found that hard cancerous tissue had infiltrated a part of the muscular coat of the bladder, and in removing this infiltrated tissue the bladder was opened, notwithstanding that its neck was held down towards the vulva by introduction through the urethra of a urethral sound having a short curve. The opening in the bladder represented a transverse slit one and one-half to two inches in length. The wall of the bladder posterior to the opening was taken hold of by a long hæmostatic forceps and held up towards the symphysis pubis. A heavy double silk ligature was passed through the upper part of the neck from the posterior to the anterior surface, the ends knotted, and the ligature used as a loop by means of which the uterus was drawn further down towards the vagina. In both lateral regions the connective tissue was too resistant to be detached from the sides of the neck by blunt instruments, and on this account I was obliged to cut it through with the curved scissors. This necessitated the ligation of several small vessels.

The whole of the neck having thus been exposed, the uterus was drawn further down, but the loop of heavy silk thread tore through the soft cancerous tissue of the neck, and I was obliged to resort again to the use of the vulsellum forceps.

With a view of limiting the operation to a supra-vaginal amputation if possible, I cut off with the curved scissors, the left half of the neck clear into the canal, and through the opening thus made introduced a finger into the uterine canal, where the exploration revealed irregularly nodulated and hard tumefied portions of the mucous membrane, reaching up towards the fundus. I consequently abandoned the idea of supra-vaginal amputation, and proceeded at once with the total extirpation of the organ. As the first step in the attainment of this end, I removed with a sharp spoon all the soft and decayed cancerous tissue of the ulcerated surface of the vaginal portion and the canal of the neck, so as to avoid septic infection from the side of the decayed tissue of the ulcerated surface when, later in the operation, it had to be inverted and turned into the peritoneal cavity. Next the anterior cul-de-sac, that is the vesico-uterine fossa, was opened by the scissors and the finger introduced into the peritoneal cavity. Using the finger as a guide, this opening was dilated outward on both sides by the scissors, keeping close to the body of the uterus until the anterior surface of the lateral ligaments was reached. The left index finger was then pushed up and around the body of the uterus, which was found to be somewhat enlarged but not adherent to any of the opposite surfaces of the peritoneum, and was therefore partly movable. The left hand was now withdrawn and the neck held up towards the symphysis pubis, by means of the vulsellum forceps, and the posterior cul-de-sac

opened in a similar manner, always keeping close to the body of the wound. The latter opening having been dilated laterally as far as the posterior surface of the lateral ligaments, the body of the uterus was anteverted by the left index finger, and the vulsellum forceps attached to the tissue of the fundus, which was so soft as to tear asunder twice before I finally succeeded in drawing it down and out through the anterior cul-de-sac, into the vulva. The left index finger was then hooked around the left lateral ligament, the fundus held over to the right by an assistant, an armed aneurism needle pushed through the right lateral ligament from the posterior to the anterior surface, and thus the ligament was ligated in two halves. A single peripheral ligature was applied around the entire lateral ligament, just exterior to the double ligature, and then the lateral ligament was cut through at a point one-half centimetre interior to the double ligature, between the latter and the uterus. The large branches of the uterine artery were not bleeding to any extent, but were, nevertheless, secured by separate silk ligatures, which were cut off short. The body of the uterus could now be draw down outside of the vulva, and no difficulty was experienced in applying similar ligatures to the left lateral ligament. Thus the entire uterus was wholly detached and taken out through the vulva. The ligatures of the lateral ligaments were left with one end long enough to extend outside of the vagina.

Through the large opening in the peritoneum, made by the removal of the uterus, projected several portions of prolapsed intestine; namely, an ansa of the sigmoid flexure, two ansæ of the small intestine, and a portion of the omentum. The wound was washed out with a two and one-half per cent. solution of carbolic acid. The hemorrhage from the bleeding surfaces was not readily checked, but was finally controlled by two silk ligatures and the use of disinfected sponges. A disinfected sponge, attached to a silk ligature, was passed into the peritoneal cavity to retain in position the prolapsed intestines, and was allowed to remain until the wound in the bladder had been closed. The prolapsed mucous membrane of the latter was dark-red in color, and presented a dotted appearance, as if numerous small ecchymoses had taken place therein. By means of sharp hooks the muscular coat of the bladder was seized, and the wound united by sutures of fine silk, which were passed through the muscular coat only, running between the latter and the mucous membrane for half a centimetre on each side. Eight of these sutures were required for the perfect closure of the wound in the bladder. All of these sutures were cut off short, with the intention of leaving them in permanently.

The next step in the operation was the closure of the wound in the peritoneum. To this end the sponge was taken out of the peritoneal cavity, and the intestines carefully cleansed from the numerous small fibrinous clots upon them. The lateral ligaments were drawn down far enough, not only to permit the palpation, but also to inspect the surface of both of the ovaries, which were found perfectly healthy, and consequently were not disturbed. An armed needle was pushed through the vaginal mucous membrane, at each lateral end of the wound in the posterior lacuna; pushed through the lateral ligament exterior to the ligatures, and then brought out through the mucous membrane of the anterior lacuna and tied, thus securing the central ends of the lateral ligaments, which were thus held down in the vagina and kept from slipping up into the peritoneal cavity. The anterior and posterior flaps of the peritoneum were seized with sharp hooks and united by fine silk sutures, of which twelve were

necessary for the perfect closure of the wound. The sutures were all cut off short and left in permanently. The slight hemorrhage caused by the stitching together of the peritoneal wound soon ceased on irrigation with two and one-half per cent. solution of carbolic acid, and the patient was put to bed on a narrow cot having a hair mattress.

Mikulicz's instrument for permanent irrigation of the vagina was introduced and fastened to a cincture around the abdomen. A lukewarm, one-tenth of one per cent. solution of thymol was used for the permanent irrigation. A flexible, soft-rubber catheter was inserted into the bladder and retained permanently. The peripheral end was held down in a vessel filled with five per cent. solution of carbolic acid.

The operation commenced at about three o'clock in the afternoon, and lasted two and one-half hours.

When the patient awoke from the narcosis, at about six P. M., she was pale and weak, but did not complain of any pain, and did not look collapsed to any considerable extent. Pulse 110; temp. 99°. 8 P. M. Pulse, 120; temp. 100°; respiration, 19. Rests quietly, and complains of no pain.

Sept. 20th. 1 A. M. Pulse, 120; temp. 100.2°. Has taken half an ounce of champagne, with bits of ice. The extremities are cold; applied hot cans to the feet. 7.30 A. M. Pulse 120; temp. 100.2°. Has rested quietly, complains of no pain, but speaks in a whisper, and appears weak. 2 P. M. Pulse 120; temp. 101.2°. Complains of pain in the abdomen, for which fifteen drops of laudanum were given, which was vomited up half an hour afterwards. She now took a tablespoonful of champagne with ice. 11 P. M. Pulse 120; temp. 102°. Complains of severe pain in the abdomen, for which fifteen drops of laudanum were given.

21st. 1 A. M. Pulse 120; temp. 101°. The patient has vomited several times, and complains of severe pain in the abdomen, for which a hypodermic injection of one-quarter of a grain of morphia was given. 8 A. M. Pulse 120; temp. 101°. Patient has rested since 1 A. M. As the pain in the abdomen had recurred, the hypodermic injection of morphia was repeated, and a pad of Lister's gauze dipped in hot carbolized water was applied over the abdomen. 4 P. M. Pulse 120; temp. 102°. She has taken small quantities of champagne and ice from time to time. The hypodermic injections of morphia quiet her for from four to five hours, but then have to be repeated as the pain recurs.

22d. 8 A. M. Pulse 120; temp. 101°. The patient passed a very restless night, but is quiet now. She sleeps for fifteen or twenty minutes only at a time. 9 A. M. Pulse 120; temp. 101.5°. She has taken half a cup of coffee, some milk, and champagne. Complains of burning sensation in the abdomen, but no pain. The urine passed through the permanent catheter contained a considerable deposit of pus, but was acid and of a normal odour. The bladder was washed out with a saturated solution of boracic acid. There is some tympanites, but no particular tenderness of the wall of the abdomen. She has passed no flatus, but says she feels that the passage of flatus would relieve the burning pain in the abdomen. A soft rubber catheter, having three additional holes cut in its walls was then inserted into the rectum and left there permanently. 10 P. M. Pulse 120; temp. 102.5°. The patient has had some pain in the abdomen during the day, which has been relieved by hypodermic injections of morphia every four to six hours. A considerable quantity of flatus has escaped through the tube in the rectum, which has eased her greatly. She

has taken from time to time small quantities of milk, coffee, and champagne. Twice she has experienced slight nausea, which was relieved by swallowing small pieces of ice. In the afternoon she became restless, uneasy, and hot, and was given a sponge-bath of tepid water and alcohol. Towards evening she became a little delirious at intervals, and complained of burning pain in the wound, and wanted the irrigating solution cold instead of warm, which request was complied with. On account of the rise in temperature, she was given four grains of quinia every four hours.

23d. 5 A. M. Pulse 120; temp. 101.6°. During the night the patient has slept at intervals for half an hour at a time. Complains of great pain in the abdomen; has a weary expression. Asked for beer, which was given to her in small quantities. Tympanites less than yesterday. No dull percussion anywhere along the ascending or descending colon. The vagina is very sensitive, the least movement of the irrigator causing her intense pain.

The cover of the irrigator is removed three times a day, in order to cleanse the apparatus of the débris of necrotic tissue, and fibrinous clots of exudated matter, that are too large to pass through the efferent tube of the apparatus.

The vulva and the vagina present some œdematous swelling, and the mucous membrane of the latter protrudes through the holes in the inner half of the irrigator. These protrusions resemble globular polypi, and they as well as the wound at the bottom of the apparatus are covered with a soft, yellowish mass of fibrinous exudated matter looking like croupous membrane. The wound and the internal surface of the apparatus are cleaned as far as possible by means of salicylated cotton dipped in five per cent. solution of carbolic acid; the débris brought out by the cotton has a gangrenous odour.

The solution in the vessel into which the efferent tube of the apparatus discharges has a scarcely perceptible gangrenous odour, which is overcome in great measure by the odour of the thymol solution used for irrigation.

8 P. M. Pulse 120; temp. 102°. Has had less pain in the abdomen during the day; has taken considerable milk and champagne; has slept at intervals; complains of weakness.

24th. 8 A. M. Pulse 120; temp. 101°; less pus in the urine than yesterday. When the bladder is washed out, after the injection of about four ounces of boracic acid solution a portion escapes through the vagina. 12 Noon. Pulse 115; temp. 100°. The patient has had half an hour of natural sleep, and is perspiring profusely. 2 P. M. Pulse 115; temp. 101.5°. Is sleeping and still perspiring freely. 4 P. M. Pulse 114; temp. 101.7°. Complains of no pain but of weakness and itching of the upper part of the back, where on examination an acute diffused eczema was found, which had been caused by the constant wetting of the sheets by the irrigating fluid, of which a part passed into the bed between the vulva and the irrigator, as the efferent tube was not sufficiently large to allow the escape of the entire amount. 6.30 P. M. Pulse 100; temp. 101.2°. 10 P. M. Pulse 112; temp. 101.2°. Has had a fit of coughing which caused some difficulty in breathing. Owing to her weakness, the exertion required to cough up the mucous matter from the throat produced a cold perspiration over the entire body, with a feeling of extreme exhaustion and almost imperceptible voice. The extremities were bathed with hot water and alcohol, and hot cans applied. Physical examination of the lungs showed normal percussion and respiration sounds, and no râles could be heard anywhere.

25th. 8 A. M. Pulse 104; temp. 101°; respiration 19. The patient rested well the remainder of the night, has no pain, partakes freely of champagne, beer, beef-tea, and coffee. She expectorates freely. The secretion from the wound is inodorous. The urine still contains pus. 10 A. M. Pulse 104; temp. 101°. 1 P. M. Pulse 104; temp. 101°. Says she feels well with the exception of pain in the sacral region from the bed-pan. 6 P. M. Pulse 104; temp. 101.2°. Is becoming restless and uneasy, but was relieved by a hypodermic injection of morphine.

26th. 8 A. M. Pulse 102; temp. 101.5°. The patient was restless until one o'clock this morning, but slept from two until four. Since that time she has been somewhat restless, principally on account of a superficial bed-sore of about the size of a dime, over the sacrum. The constant irrigating apparatus was removed with some difficulty owing to the polypus-like protrusions of the vaginal mucous membrane through the holes in the irrigator. Two of the ligatures around the broad ligaments were found to be loose and were removed. The whole of the inner surface of the vagina was superficially eroded and partially covered with yellowish adherent fibrinous matter. A double soft rubber drainage tube was now inserted, and retained in position by means of salicylated cotton covered with a layer of carbolyzed cosmoline. The patient was turned on the side and supported in this position by means of pillows. 12 Noon. Pulse 110; temp. 101.2°. She is resting better after a sponge-bath. 7 P. M. Pulse 100; temp. 101.2°. She has taken during the day, about eight ounces of beef-tea, with the yolk of an egg, champagne, coffee, a little chicken broth, and some Seltzer water.

27th. 8 A. M. Pulse 100; temp. 100.2°. The patient has slept several hours at a time during the night; she complains of frequent desire of micturition. The urine contains a little pus. A pill of camphor, two grains; opium, one grain, was ordered morning and night. The discharge through the drainage tubes has no offensive odour. 12 Noon. Pulse 104; temp. 100.6°. 5 P. M. Pulse 98; temp. 100.7°. The patient sleeps for half an hour at a time and complains of no pain. 12 Midnight. Pulse 100; temp. 100.6°. She feels somewhat weak, but complains only of pain in the calves of the legs, which was relieved by rubbing with alcohol.

28th. 9 A. M. Pulse 98; temp. 100.2°. The patient feels stronger and takes more food. 7.30 P. M. Pulse 100; temp. 100.4°. Has taken considerable liquid nourishment during the day; one egg, eight ounces of chicken soup, some beef-tea, besides champagne and beer.

29th. 9 A. M. Pulse 96; temp. 99.4°. She has slept considerably during the night, and her only complaint is in regard to the small bed-sore over the sacrum. 6 P. M. Pulse 96; temp. 100.8°. Has had an annoying cough during the day, which causes some pain in the left iliac region, especially when she lies on the left side. R. Tr. opii camphoratæ; Syrup. aurantii corticis, āā ʒj. M. Sig. every two or three hours. 12 Midnight. Pulse 96; temp. 100.2°.

30th. 9 A. M. Pulse 98; temp. 99.1°. The patient passed a somewhat restless night, but has had no pain and no cough. 1 P. M. Pulse 100; temp. 99.8°. Complains of some pain on urinating through the permanent catheter. Otherwise she feels well, and has a natural expression. She has taken to-day the first solid food since the operation; toast with her coffee in the morning, and a piece of fish and a little apple pudding at dinner. 6 P. M. Pulse 90; temp. 99.6°.

October 1st. 9 A. M. Pulse 90; temp. 98.4°. 7 P. M. Pulse 94;

temp. 100.3°. Some urine still passes through the vagina. When the bladder is washed out, about three ounces of the solution may be injected before any will pass through the vaginal drainage tube. When the urine passes through the latter, the patient complains of pain in the vulva on account of the superficial granulating erosions in the mucous membrane at this point, caused by the pressure of the irrigator during the first week after the operation. These ulcerated surfaces were covered with carbolyzed cosmoline applied to a tampon of salicylated cotton and placed around the ends of the drainage tube. The permanent catheter was removed.

2d. 10 A. M. Pulse 100; temp. 99.5°. 9 P. M. Pulse 94; temp. 100°.

3d. A. M. Pulse 100; temp. 99.7°. P. M. Pulse 100; temp. 100.5°.

4th. A. M. Pulse 100; temp. 99.7°. P. M. Pulse 96; temp. 100°.

5th. A. M. Pulse 96; temp. 99°. P. M. Pulse 96; temp. 100°.

6th. A. M. Pulse 90; temp. 99°. P. M. Pulse 96; temp. 99.7°.

The patient's bowels, which had not moved since the operation, were moved to-day by an enema, and a very large quantity of feces was passed, after which she felt somewhat weak, and a little sore in the lower part of the abdomen.

7th. A. M. Pulse 90; temp. 99°. P. M. 90; temp. 99.5°.

8th. A. M. Pulse 85; temp. 99°. P. M. Pulse 90; temp. 99.2°. The patient has had a natural passage from the bowels; sleeps all night; has a fair appetite; can turn over on her side, and is feeling stronger.

11th. Pulse and temperature normal. The patient was taken out of bed and sat up in a reclining chair for a couple of hours. The quinine was discontinued, and two two-grain iodide of iron pills ordered three times a day.

17th. Pulse and temperature normal. The patient is up and around all day long, and gaining strength rapidly. When she walks, a little urine passes through the vagina, keeping her clothing wet all the time. At night there will be no passage of urine for about two hours, then the desire for micturition will set in suddenly, and before she can get the bed-pan, part of the urine will pass through the vagina. There is very little discharge through the drainage-tubes, which were removed. The nurse was instructed to wash out the vagina morning and night.

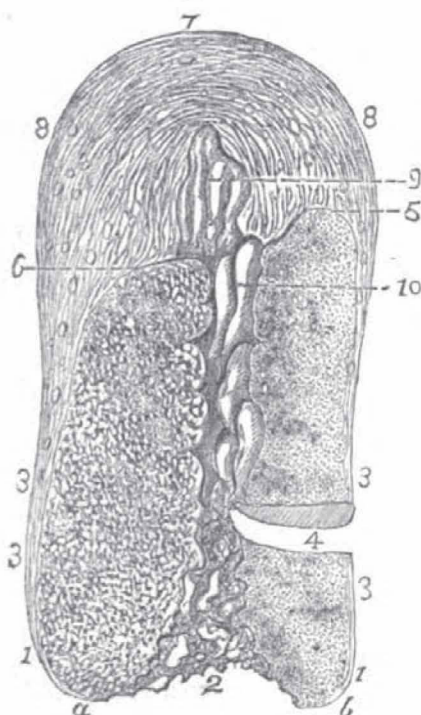
24th. The patient is up and around the house all day, and is feeling stronger every day. She states that she is feeling better than for the past five or six months, her anæmic condition is disappearing, and some color is returning to her cheeks. The vesico-vaginal fistula is closed, so that she has no discharge through the vagina at night. During the day she is obliged to urinate about every three hours, but all of the urine passes through the urethra. The desire to urinate still comes on suddenly, and if she does not respond quickly, some of the urine will be passed through the urethra.

On examination of the vagina with a speculum, it was seen that on the left side was a perfect linear cicatrix, but on the right side, two of the ligatures around the broad ligament were still adherent, and offered so much resistance to the forceps that they were allowed to remain *in situ* a little longer. Lower down in the vagina were five pedunculated polypi, one centimetre long and half a centimetre in breadth, which remained as reminiscences of the irrigating apparatus as above mentioned.

Examination of the Extirpated Uterus showed the following: The whole organ was four and one-half inches long, the cavity four inches

long. The cervix was considerably enlarged, being about two inches in diameter; the thickness of the wall at this place was more than three-quarters of an inch. The external os and the whole of the cervical canal presented an irregularly ulcerated surface, and the thickened wall was seen to consist of white carcinomatous tissue. The body was enlarged, two and one-half inches broad, one inch and three-quarters in antero-posterior diameter, and six inches and three-quarters in circumference. The anterior wall was one inch thick, the posterior wall three-quarters of an inch. The whole of the lower half of the cavity of the body was filled by an irregularly nodulated cancerous mass, covered with hypertrophied mucous membrane, as shown at 10, in figure 1. The cancerous mass infiltrated the wall of the body as high up as the tumour of the cavity extended, namely, involving the entire lower half of the anterior wall, and extending higher on the posterior wall, so as to involve the lower two-thirds of the latter.

Fig. 1.



ANTERO-POSTERIOR SECTION THROUGH THE EXTIRPATED UTERUS.—1. Vaginal portion; *a*, anterior lip; *b*, posterior lip. 2. Ulcerated external os. 3. Cervix uteri. 4. Cut through the neck, through which digital exploration revealed irregular cancerous masses in the cavity of the fundus. 5. Limit of cancer in the posterior wall of the fundus. 6. Limit of cancer in the anterior wall. 7. Fundus of the uterus. 8. Healthy wall of the somewhat enlarged fundus uteri. 9. Dilated upper half of the cavity of the fundus uteri. 10. Globular cancerous vegetations in the mucous membrane of the lower half of the cavity of the fundus uteri.

Microscopical Examination of the Tumour showed the following: A section from the centre of the infiltrated wall showed a stroma of connective tissue and organic muscular fibres infiltrated with numerous young lymphoid or connective-tissue cells. The stroma inclosed very large and irregular-shaped cavities, some of which were lined with cylindrical cells, and filled with large, multiform, epithelial cells; others had no regular lining of cylindrical cells, but contained large epithelial cells, mostly irregular in shape, but some of which approached the cylindrical type, and others the pavement-cell type.

A section from the upper border of the tumour showed the large carcinomatous alveoli, defined by a rather sharp line, above which the uterine tissue showed the normal structure of organic muscular fibres, connective tissue, and vessels, not infiltrated with any proliferation of young cells.

Sections made at various points on the cut surfaces of the lateral ligaments showed neither alveoli with epithelial cells, nor infiltration with leucocytes or young connective-tissue cells.

Consequently, the character of the tumour was found to be the following: An epithelial carcinoma of mixed cylindrical-celled and pavement-celled types, leaning rather towards the character of the typical so-called epitheliomas, than to medullary carcinomas. The sharp line of definition upward pointed to a relatively local, hence relatively benignant character of the growth. The cylindrical cells in the alveoli and the extension of the carcinoma high up in the cavity of the corpus showed its origin to have taken place in the mucous membrane of the cervix uteri. The absence of carcinomatous matter in the broad ligaments gave some reason for the hope that the whole of the carcinomatous tissue had been removed, which, taken in connection with the relatively benignant character of the tumour, led to the belief and hope that the reappearance of the tumour, either here, or in the neighbouring lymph glands, might be deferred for a period corresponding to the good results obtained from the extirpation of epithelial carcinomas in other parts of the body, as, for instance, the lips and rectum.

As this operation is one of the latest of the steps forward in modern surgery, and cannot as yet be considered the common property of the profession, because it has not yet passed out of periodical literature, not even so far as into any monograph, I shall try, as far as the material at my command will permit me, to review the subject, considering, first: The indications for the operation; second, the operation itself; third, the after-treatment; fourth and finally, the results.

I. *Indications for the Operation.*

Malignant growths of the uterus have thus far been the only indications for the vaginal extirpation of that organ. Comparing the statistics of the abdominal with those of the vaginal operation, it is safe to say that whenever the total removal of the organ is indicated and this can be done through the vagina, that is, when the body of the organ is not enlarged to a very considerable extent, the latter method is preferable to the operation by abdominal section, for the following reasons:—

(a) *The shock*, which we know to be a capital danger in any protracted operation combined with laparotomy, is so much less in the vaginal extirpation that Schröder has been generally acknowledged to be correct in his statement that a woman after the total extirpation of the uterus through the vagina resembles rather a puerpera after a considerable post-partum hemorrhage, than a patient who has just experienced a very severe operation.

(b) *The ligation of the ureters*, and the accidental division of the ureters and opening of the bladder can be almost if not entirely avoided in the vaginal extirpation by sufficient skill and care in the operation; while this dangerous and often fatal complication is likely to, and in a number of cases has actually taken place during the abdominal operation, because the field of operation in this method is far from the surface; so far, indeed,

that resection of the symphysis pubis has been proposed as a facilitating measure. Besides this, the separation of the organs in question from the uterus has to be effected in the dark, while in the vaginal extirpation this part of the field of operation is much more easily accessible.

(c) *The safe removal of all the carcinomatous tissue*, which, as most uterine carcinomas, originate in or near the vaginal portion, and sometimes appear as isolated nodules involving the vaginal mucous membrane in one or both lacunæ, can be effected with almost entire certainty through the vagina only, where the whole of the field of operation is open to view; while by the abdominal operation the removal of the vaginal portion is performed entirely in the dark, guided only by the digital touch.

The character of the malignant growth, which is to be extirpated through the vagina, will, as above stated, be most frequently a carcinoma, more rarely a sarcoma, and even more rarely, as in Czerny's case, an adenoma of the mucous membrane, originating in a fibro-myxo-myoma of the wall of the organ.

When one of these malignant growths has originated in the cervix and involves part of the fundus, or has originated in the fundus and extended from there to the neck, and the fundus is not enlarged above a size that will permit of a complete version of the organ through the anterior or posterior lacuna into the vagina, the operation is indicated. A large majority of uterine carcinomas commence in the vaginal portion and will, when operated upon in time, permit a radical extirpation of all the diseased tissue by means of an operation much less dangerous, supra-vaginal amputation of the cervix uteri. Consequently, the total extirpation through the vagina will be required in cases of these carcinomas, only when they have not been operated upon in time, that is, not until the carcinoma has extended above the internal os.

A uterine carcinoma seldom originates in the mucous membrane of the cervix. According to the laws of development of such carcinomas, the tumour will generally be a cylindrical-celled carcinoma, and this form of cancer will be apt to reach far up into the cavity of the fundus at an early stage of the disease, before any considerable enlargement or ulceration of the vaginal portion has taken place. Consequently, carcinomata originating in the mucous membrane of the cervix will indicate, almost from the beginning of the disease, the total extirpation of the uterus through the vagina.

It may be difficult in a number of cases to decide, even after most minute preliminary examination, whether a uterine carcinoma involving the vaginal portion and the cervix can be removed satisfactorily by supra-vaginal amputation alone, or by total extirpation of the organ. Practically the decision is only of slight importance, if we proceed in the following manner: Prepare for the total extirpation; commence the operation as if the removal of the cervix only were to be performed; then if it is

discovered that all the diseased tissue cannot be removed by this procedure, proceed at once to the total extirpation. This plan of procedure does not involve any loss of time, either to the patient or to the operating surgeon, because supra-vaginal amputation is the first step in the total extirpation through the vagina.

The sarcomas, which originate much more frequently in the fundus than in the cervix, will undoubtedly, in most cases, before the operation can be considered, have enlarged the fundus to such an extent as to make the extirpation *per vaginam* impracticable, thus limiting their extirpation to one of the abdominal operations.

But if a sarcoma of the uterus can be diagnosed in time to permit the removal of the organ through the vagina, this operation would not only be preferable, but would also be likely to give most satisfactory results as to permanent cure, since we know that uterine sarcomas are much less liable to involve the broad ligaments than carcinomas.

In the more rare forms of malignant growths, such as adeno-fibromas or adeno-sarcomas, the total extirpation of the uterus through the vagina is to be considered in the beginning of the disease, when the hemorrhages and relapses cannot be controlled by any other operative procedure. But unfortunately most myxomas, fibro-myxomas, and fibro-myomas cause too great enlargement of the fundus before the operation can be considered, and consequently require total abdominal extirpation or abdominal amputation of the cervix. Adenomas also will generally permit of the removal of the involved tissues by scraping out with the sharp spoon, or by cauterization with the galvano-cautery. But still Czerny's case stands as an example of the possible indication of the operation in this variety of tumours.

As contra-indications to the total extirpation through the vagina, we may mention considerable involvement of the broad ligaments, bladder, or rectum by the cancer, and the palpable infiltration of the deep-seated lymph glands along the border of the pelvis minor, and finally very limited mobility of the uterus. If it is found on exploration that the uterus cannot be moved up and down almost as easily as when in its normal condition, but is attached to the walls of the pelvis minor, or to the organs situated behind it, the operation may have to be abandoned, because it is a *conditio sine qua non* for its practicability that the vaginal portion can be drawn down almost into the vulva, or very near to the end of the vagina. Too violent traction may cause rupture of adhesions or of the broad ligament, with subsequent hemorrhage from vessels situated so high up in the abdominal cavity as to be entirely inaccessible for surgical control through the vagina.

II. The Operation.

A few preparatory measures before the operation may be indicated. If the patient has a fetid carcinomatous ulcer of the vaginal portion, or of

the external os, we naturally desire to have the mucous membrane of the vagina disinfected as far as possible before leaving this cavity in open communication with the pelvic cellular tissue, or even the peritoneal cavity. To this end it has been advised that the entire decayed wall of the cancerous ulcer be scraped out with the sharp spoon as a preparatory procedure, five to eight days before the operation; and then that the vagina be washed out two or three times daily with a two or three per cent. solution of carbolic acid. After each injection the vagina should be filled up with salicylated absorbent cotton to take up any fetid matter which may be excreted from the tumour. During this period it is advisable to give only liquid food to the patient, and to administer mild cathartics sufficient to produce daily alvine discharges, with a view of having the bowels empty at the time of the operation, that alvine discharges may not occur during the first week or two of the after-treatment.

Six reliable assistants are required in performing the extirpation. The patient is deeply anæsthetized and placed on a table, in the lithotomy position. Good light (I should always prefer sunlight) upon the field of operation is very necessary. The vagina is first washed out with a five per cent. solution of carbolic acid; the hairs on the mons veneris and perineum carefully shaved off, and the skin around the vulva cleaned and disinfected by means of soap, nail-brush, and three to five per cent. solution of carbolic acid. The spray is not employed, as it is unnecessary and troublesome; but the field of the operation is constantly irrigated by a two to three per cent. solution of carbolic acid, either by an irrigator, or, what I consider preferable, by disinfected sponges.

An assistant on each side holds a femur of the patient, and also a Simon's speculum for dilatation of the vulva. The blade of the speculum should be a little longer than usual; that is, two and one-half to three inches instead of the ordinary length, two inches, and somewhat concave laterally, so as to fit against the pubic arch, with a view to the dilatation of the vagina to its utmost extent.

If the entrance to the vagina should be too narrow, as may be the case in nulliparæ, the perineum should be divided in the median line. This wound may, at the close of the operation, be united by a simple perineorrhaphy.

If it is discovered later in the operation that any part of the vagina is too narrow, it may be enlarged with a knife in the lateral regions, so that the bladder and rectum may not be accidentally opened.

The vagina having thus been sufficiently dilated by means of Simon's specula held against the anterior and posterior wall, the vaginal portion of the uterus is now seized by a strong volsellum forceps, and drawn down as far as possible toward the vulva. In the majority of cases, the cancerous tissue which is seized by the forceps is so soft and friable that the forceps will tear through when the necessary traction is applied to the

organ. To obviate this difficulty Billroth has devised a strong vulsellum forceps, having four instead of two hooks at the end of each branch. The only additional change in this instrument that I suggest, is that these hooks be flattened instead of cylindrical, so that the friable tissue may be more firmly held.

The vaginal portion having thus been drawn down towards the vulva, Mikulicz advises that a heavy silk ligature be passed through each lateral portion of the fornix of the vagina, close to the cervix, and within the area of the tissue to be extirpated. From experiments on the cadaver, I was unable to see how these loops could facilitate the drawing down of the organ, as I invariably found that on exercising any traction upon them, the mucous membrane and soft tissues around the cervix would alone be drawn down, the cervix not yielding. Schröder does not make use of these loops, but handles the organ with the vulsellum forceps alone.

The next step in the operation is to make a circular incision through the mucous membrane of the fornix of the vagina around the lower end of the cervix. It is needless to state that this incision must be made about one centimetre distant from any visible carcinomatous infiltrated portion of the mucous membrane of the vaginal portion. The loose sub-mucous, cellular tissue should be separated from the infiltrated cervix by means of blunt instruments, such as the handle of the scalpel or the closed curved scissors, that is, with the instrument which has been used to make the incision. I prefer for this purpose the curved scissors, such as are generally used in plastic vaginal operations. When this dissection has been made, the uterus will yield more readily to the traction of the vulsellum forceps. It is now advisable to pass two loops of heavy silk through the middle or upper portion of the cervix, by means of which the latter may be drawn down and handled more easily.

On the lateral sides of the cervix, the connective tissue forming the lower borders of the lateral ligaments is firm and resistant, and will require the knife or scissors for its division. We must here expect to meet with bleeding vessels which will have to be ligated separately. To avoid unnecessary hemorrhage it is well to act upon Czerny's suggestion, and place an assistant on the left or right side of the patient, to make digital compression of the abdominal aorta, whenever needed during the operation.

The dissection of the cervix being finished, the uterus can be drawn further down, usually enough to allow of the palpation with the finger of the lower portion of the fundus uteri.

At this period of the operation it must be decided whether the supra-vaginal amputation or the total extirpation of the uterus shall be performed. A double heavy silk thread is passed through the lower portion of the fundus, looped, and taken to the side to be used later in handling the fundus. Mikulicz knots this loop and uses it as a hæmostatic during the amputation of the cervix. I prefer, however, not to use this ligature,

as I can then judge better of the condition of the parts after the amputation. An incision is now made through the cervix into the uterine canal, or still better, the entire cervix is removed. The uterine canal is explored by the finger, in order to ascertain if, and how far, the cancerous infiltration has involved the mucous membrane of the fundus. By means of this exploration and the examination just referred to, we will be able to decide whether supra-vaginal amputation will enable us to remove the whole amount of cancerous tissue, and if so, to complete the operation at this point in the usual manner by uniting the cut surfaces of the mucous membrane. If, however, the whole of the cancerous tissue cannot be removed by this procedure, the next step in the total extirpation of the organ must be made, namely :—

The Opening into the Peritoneal Cavity. (a) *Opening of the Anterior Cul-de-sac.*—Here we will have to use extreme care to avoid the opening of the bladder. In some cases this dissection is very easy; in others, very difficult. By the loop mentioned above, the fundus of the uterus is drawn downwards and backwards toward the anus, and the loose connective tissue between the bladder and the uterus separated by blunt instruments. If in making this separation we keep too close to the fundus, we run the risk of dissecting into the tissue of its wall, in which case all of the diseased tissue may not be removed; and, on the other hand, if we keep away from the fundus uteri and close to the bladder, we may penetrate the posterior wall of the latter, which, if its wall is not diseased, should by all means be avoided. As an aid, at this stage of the operation, Mikulicz has made a very rational proposition, namely, to introduce a catheter or urethral sound with short curve through the urethra into the bladder, to turn the point forward, so as to push the cervix of the bladder out into the vagina, thereby making the posterior wall of the bladder tense, and at the same time lifting it up and away from the anterior wall of the uterus, which has been drawn backwards and downwards.

When dissecting with the organs in this position, the accidental opening into the bladder will be avoided, and, finally, we will reach the peritoneum, through which, in the median line, a little opening is made, and through this opening a finger is introduced into the vesico-uterine fossa. Using the finger as a guide, the opening in the peritoneum is now dilated outwards on both sides, keeping close to the uterus, until the anterior surface of the broad ligaments is reached.

By holding the bladder and uterus in the positions just described, there is little or no danger of cutting into the ureters, as they will be from one to two centimetres out of the field of operation. As to the opening of the bladder, there are cases in which the cancer has extended into its muscular coat, or even through this and into the mucous membrane. As it is a law in the removal of cancerous tumours to remove all the diseased tissue, irrespective of the organs met with, except as far as actual and immedi-

ate danger to life is concerned, we may proceed (as in my case) to the opening, in some cases necessarily extensive, of the bladder. Schröder does not hesitate, when necessary, to recommend the deliberate performance of this complication to the operation, and my case shows that this can be accomplished without any danger to the patient when the vesical wound is carefully closed, and the after-treatment conducted with reference to this complication. I shall return later on to the further consideration of this point.

(b) *The Opening of the Posterior Cul-de-sac.*—When the uterus has been drawn upward toward the symphysis pubis, one or two fingers should be introduced through the anterior cul-de-sac, hooked around the fundus, and passed down into Douglas's cul-de-sac, and the opening of the latter easily effected on the point of the finger as a guide. The opening thus made is dilated outwards toward the lateral ligaments, in the same way as this was accomplished in the anterior cul-de-sac. In passing the fingers around the fundus we may sometimes meet with adhesions between the latter and the surrounding peritoneal walls. Such adhesions should be separated, if possible, by the finger nails, as close to the uterus as possible. Too firm, heavy, and extensive adhesions may necessitate the abandonment of the operation at this point (Martin), as too forcible traction would be liable to tear off large portions of the parietal peritoneum, torn vessels in which might cause hemorrhage into the peritoneal cavity at a point too high up to permit the bleeding vessels to be caught up and ligated from the vagina.

The fundus of the uterus is now adherent only by or suspended in the lateral ligaments; but before we can seize these, we will have to proceed with the next step in the operation:

The Eversion of the Fundus Uteri.—It is necessary to seize the fundus and draw it down into the vulva, before the lateral ligaments can be brought into the field of operation. The eversion may in many cases be accomplished by combined manipulation with the index finger of each hand, without any particular difficulty. But in some cases, when, for instance, the fundus is somewhat enlarged, or the lateral ligaments short and tense, it may prove a rather troublesome step in the operation. Sharp hooks or the vulsellum forceps, introduced through the vesico-uterine fossa, and seizing the fundus uteri, which has been pressed forward by the index finger of the left hand in Douglas's fossa, will usually be sufficient to bring the fundus down through the vesico-uterine fossa into the vagina. But in a number of cases the tissue of the fundus is soft, and these instruments will tear through. As the operation itself is so difficult, and the time occupied in its performance so great, any suggestions by which the duration of any of the steps of the operation may be shortened, and the operation facilitated should be accepted with gratitude.

Martin, who has several times met with difficulty in the eversion of the

uterus, has devised¹ an instrument of about the shape and size of the urethral sound, the end of which is enlarged into an oblong, oval body, or as he describes it "pear-shaped." The circumference of the end is four centimetres, and the whole instrument thirty-three centimetres long. He pushes the pear-shaped end of this instrument into the uterine canal, holding the handle and shaft up against the symphysis pubis. On bringing the shaft down towards the rectum, the fundus uteri can be pushed upward against the concave surface of a Sims' speculum, and be made to slide out, far enough along this, to be seized in the anterior lacuna. A loop of heavy silk thread is now passed through the fundus, the ends knotted, so that by it the fundus may be drawn down, or moved in any desired direction during the next step of the operation :

The Separation of the Uterus from the Lateral Ligaments.—The main point to have in view during this stage of the operation is to effect perfect security for immediate, and especially for secondary, hemorrhage from the large vessels supplying the uterus. This may be effected in two ways: (a) By the separate ligation of every bleeding vessel as soon as opened (Czerny, Hofmeier); or (b) By ligating the lateral ligaments *en masse* (Billroth, Mikulicz, Schröder). The future must decide which of these methods is preferable; each of them has its decided advantages.

(a) *The gradual division and successive ligation of all vessels* is the most rational, on general surgical principles, and possesses the two following advantages: First, It permits us to inspect the entire cut surface of the ligaments, and ascertain if any cancerous tissue has been left *in situ*. If this has been done, it permits us by means of blunt instruments, as for instance, two dissecting forceps, to excavate and remove any spots of cancerous tissue, cancerous infiltrated lymph ducts and lymph glands, as far as the exterior wall of the pelvis minor. This may be done with the same security and in exactly the same way in which the similar operation for the removal of cancerous lymph glands in the axilla, after the removal of a cancerous mammary gland, is performed. Second, It has the advantage of not leaving any part of the lateral ligament to slough, as does the ligature *en masse*, and consequently, there is no risk of leaving decomposing tissue in or inside of the peritoneal wound.

This procedure has the following disadvantages, which of course are identical with the advantages of the other method, namely, that it takes a longer time and is less secure, as regards the stopping of hemorrhage.

(b) *Ligature en masse.*—I feel inclined, with Billroth, Mikulicz, and Schröder, to consider the ligature *en masse*, as the safest and most easily accomplished. The way to proceed therewith is as follows: Pass a heavy silk thread round the entire ligament, and ligate as far out towards the lateral wall of the pelvis as possible. Insert just at the medial side of

¹ Centralblatt für Gynäkologie, No. 5, 1881, p. 99.

this ligature through the midst of the lateral ligament, a double heavy silk thread, by means of a pointed, curved, aneurism needle, and thus ligate the ligament in two portions. Leave one of the ends of these ligatures long enough to extend outside of the vagina. As the lateral ligaments are often rather voluminous, and the slipping of the ligatures would be a very undesirable accident, Billroth's avoidance of this by the following device is noteworthy. Before applying the ligatures around the lateral ligament, he seizes the latter, through its entire thickness, with a strong forceps having two long and narrow branches, made especially for this purpose, and closing the forceps forcibly, he makes by means of its branches a depression, furrow, or sulcus in the ligament, exactly the same effect as is produced in the pedicle of ovarian tumours by means of the common, temporary clamp. In this furrow he applies the ligature *en masse*, after the removal of the forceps. A second furrow is made for the double reserve ligature, in two portions.

When thus the lateral ligament is securely ligated, the long ends of the ligatures are run downward and outward, the uterus drawn inward toward the median line, and the central portion of the lateral ligament divided at about one centimetre from the ligature. For further security against hemorrhage the larger vessels met with may be ligated separately with catgut or silk.

One of the lateral ligaments having thus been divided, it is easy to draw the fundus uteri down into the vulva, and then not only explore with the finger but even inspect with the eye, the ovaries and the whole of the lateral ligaments. If any of these parts are involved with cancer or otherwise degenerated, the question of their removal naturally presents itself. As far as I know, this has not yet been performed successfully, but in cases of need, where the diseased parts in question are sufficiently movable to permit of their being brought down into the field of operation, ligatures can be passed around their peripheral attachments, and they themselves removed (Schröder). The second lateral ligament is easily ligated, in the same manner as above described, the uterus separated entirely, and taken out through the vulva.

Treatment of the Peritoneal and Vaginal Wounds.—It is as yet an open question whether the wound in the peritoneum shall be left open or carefully united. To me it seems decidedly the most rational procedure to unite the whole of the peritoneal wound as carefully as possible (Czerny, Martin). To this end, I proceed in the following manner:—

A heavy silk ligature is pushed in through the mucous membrane of the posterior lacuna, near the lateral corner of the vaginal wound; passed through the midst of the ligatured lateral ligament, just outside of the ligature, and brought out through the mucous membrane of the anterior lacuna. When this ligature is tied it serves to draw the peripheral end of the lateral ligaments down into the vagina, or at any rate into the

vaginal wound, with a view of keeping the sloughing central portions of the lateral ligaments out of the peritoneal cavity.

After having carefully cleaned the prolapsing intestines with disinfected sponges, some of which are allowed to remain for a short time between the intestines and the upper part of Douglas's fossa, I take hold of the edges of the peritoneum with sharp hooks, draw them down and towards each other, and unite them carefully with fine sutures of disinfected silk, distant about one-half centimetre from each other, commencing in the median line so as to be hindered less by the prolapsing intestines, and continuing from this point outward on each side until the last suture is closed to or through the peritoneal surface of the lateral ligament, which had previously been drawn down.

If the bladder or rectum has been opened by accident or intention, these openings are carefully united by a sufficient number of fine silk sutures, taking care to have these passing through the muscular walls of these organs alone, and not involving the mucous membrane. All these sutures are cut off short and left in permanently.

Some operators (Billroth, Mikulicz, Schröder) do not unite the wound in the peritoneum. Schröder leaves it as it is and inserts a heavy drainage tube, terminating in a transverse portion, the ends of which rest upon the upper inner surface of the ligated lateral ligament. The vaginal portion of this tube is kept firmly in place by means of salicylated cotton wound round it.

Billroth and Mikulicz pass through the edges of both flaps of the peritoneal wound, silk threads, two or three on each side. These are knotted, and when traction is made upon them, draw the edges of the wound together so that it resembles the mouth of a tobacco pouch. The latter procedure of Billroth and Mikulicz is resorted to, not with a view of using drainage tubes, but rather with a view of employing permanent irrigation in all cases. To the external opening of their irrigator are attached the ends of all the silk threads both from the peritoneal wound and from the lateral ligaments. That this latter procedure does not present any absolute security against invasion of the peritoneal cavity by liquid or micrococci from the vagina is obvious, and in cases like my own, in which the bladder was opened, I should certainly trust nothing but a most minute closure of the peritoneal wound.

Before considering the after-treatment, I shall only say about the operation, that even under the most favourable circumstances it is a long and difficult one. The space that is left for the field of operation is small. The appliance of sutures and ligature of vessels has as a general rule to be done one or two inches internal to the vulva. The working space in the vagina may be increased somewhat by the use of a Simon's speculum, applied in each lateral wall of the cavity. No considerable hemorrhage has been reported in any of the cases on record, still the compression of the abdominal aorta may, in case of need, be of great value.

In less favourable cases, in which, on account of adhesions or for some other reason, the uterus is not very movable; the walls of the vagina more rigid; the bladder or rectum opened; the operation certainly deserves, as Martin says, "to be classed as one of the most difficult operative procedures in abdominal surgery."

Possible Mishaps during the Operation.—We have already mentioned the opening of the bladder and rectum and shown that this may be sometimes necessary, so that these should not be counted among the mishaps, strictly speaking, and the treatment of such openings by careful union has been also mentioned.

The division of one or both of the ureters might be among the possibilities, though I do not know that it has happened in any of the cases on record. The only way to obviate the ill consequences of such a division, that is, evacuation of urine from the ureter into the peritoneal cavity, would be to seize the upper end of the divided ureter, pass a loop through its wall, draw it down into the vagina, and fix it there by means of sutures. When this is carried out effectually, I do not think that the mishap would necessarily endanger the patient's life, as the wound would heal up, and only a uretero-vaginal fistula would remain.

The involving of one of the ureters in the ligature *en masse* of the lateral ligament should, of course, be studiously avoided. If, however, the operator exercise due care, there is hardly any risk of this most dangerous, not to say fatal, complication.

The accidental opening of the intestines prolapsing from or tied down into the vesico-uterine or Douglas's fossæ by old adhesions is within the more remote possibilities. Undesirable as such an accident would be, it might not be necessarily fatal if a perfect union with catgut, or better, fine aseptic silk sutures is carefully effected, according to the well-known laws for operations upon the intestines.

Hemorrhage from torn vessels situated too high up in the pelvic cavity to permit of effective ligature may, as above stated, prove fatal, but this, we are happy to say, is rarely met with.

III. *After-Treatment.*

The main and predominant question in the after-treatment is the question of drainage, combined or, we might say, identical with that form of the antiseptic method or antiseptic precautions which will prove the most effectual in keeping inflammation or infection away from the wound, and the surrounding tissues and cavities. In considering this question, we must take into account the merits and demerits of drainage tubes and the washing out of the vagina through these, on the one hand, and permanent irrigation on the other.

(a) *Drainage Tubes.*—A heavy drainage tube with a transverse T-shaped portion resting in the ununited peritoneal and vaginal wound, and

retained in position by salicylated cotton wound around it, is employed by Schröder. He makes injections of disinfectant solutions only when rise in temperature or fetid smell of the discharges calls for it. His brilliant success with this operation is a strong argument in favour of his method of treatment, in spite of any *à priori* objections that might be made about not uniting the peritoneal wound and the infrequent washing out of the drainage tube. Martin makes use of drainage tubes only for the drainage of the vaginal wound, as he recommends a careful union of the peritoneal wound.

The use of drainage-tubes has the great advantage that it incommodes the patient very little in the after-treatment as compared with the permanent irrigator. But it is still an open question whether sufficient disinfection can always be effected by them in cases where the bladder or rectum has been opened. In one of Czerny's cases, in which the bladder was opened, the peritoneal wound was united, drainage-tubes inserted, and the patient recovered. In Billroth's case, No. 4, in which the bladder was opened, and united by sutures, and the patient died from septic peritonitis thirty hours after the operation, drainage-tubes were employed in the ununited peritoneal wound according to Schröder's method.

(b) *Constant Irrigation.*—Two fatal cases of Billroth's, in which peritonitis occurred notwithstanding the use of drainage-tubes, led Mikulicz to consider permanent irrigation as a method permitting more perfect disinfection, and thereby promising the avoidance of fatal septic inflammations; namely, septic peritonitis and phlegmonous inflammation of the cellular tissue of the pelvis.

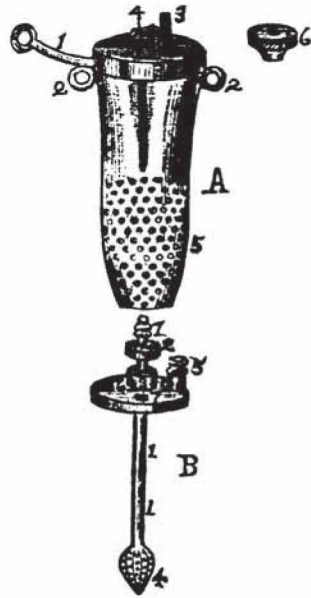
In some of the fatal cases in which drainage of the peritoneal cavity had been employed, the post-mortem examination showed that this drainage had been frustrated by the pliable walls of the intestines and still more mobile and pliable omentum which had occluded the openings in the drainage-tubes, above which large accumulations of septic fluid had formed. On this account Mikulicz came to the conclusion that it was impossible by any method known up to the present time to make effective drainage of the peritoneal cavity. From an *à priori* pathologico-anatomical point of view, I shall most certainly agree with him in this respect; but there is always some dissension between *à priori* reasonings and facts, as the statistics have shown that Bardenheuer's drainage through the vagina is a valuable factor in making Freund's operation, that is, the abdominal method of total extirpation of the uterus, considerably less fatal.

It occurred to me that permanent irrigation would be the safest method in my case, in which the bladder had been opened, and I consequently used a permanent irrigator, made exactly after the pattern of Mikulicz's, as shown in the cut in his above-mentioned paper.¹

¹ Wiener Medizinische Wochenschrift, No. 4, 1881, p. 96.

As I found in the course of the after-treatment some inconveniences of minor importance attendant upon the use of Mikulicz's irrigator, I shall here, for the sake of brevity, describe the modified instrument I propose to use. As shown in Fig. 2, it consists of a cylindrical vaginal speculum,

Fig. 2.



VAGINAL IRRIGATOR (half of natural size).—A. SPECULUM, *lateral view*.—1. Handle, through the ring of which any cylindrical body, for instance, a vaginal dressing forceps, can be pushed for getting a firm hold. 2, 2. Rings for the bands for attachment of the apparatus to abdominal cincture. 3. Lateral screws to fasten the cover. 4. Small spring for attachment of long ends of ligatures around the broad ligaments. 5. Small holes through the internal half of speculum. 6. Nuts.

B. COVER.—1. Afferent tube with 2. Screw. 3. Stopcock, and 4. Terminal bulb with small openings. 5. Efferent tube. 6. Openings for overflow tube. 7. Hole for lateral screw.

Note.—The cover does not fit tightly to the speculum, but is made air tight by means of rubber washers.

the central end of which is compressed and flattened so as to terminate not in a circular but in an oval opening, the transverse diameter of which is the longer, and of the same length as the diameter of the tube. The internal half of the speculum is perforated by a large number of small holes cut close to one another. Mikulicz's irrigator has a small number of large holes, through which the œdematous mucous membrane of the vagina protruded a few days after the operation, forming polypi, which not only made every movement of the instrument painful, but made its removal extremely difficult. At the outer end of this speculum, at its upper and lower aspect, in the median line, are rings through which bands are passed, which are attached to a cincture around the abdomen, for the purpose of retaining the instrument in position. At the free border of the speculum are two small hooks, for the attachment of the long ends of the ligatures around the broad ligaments. To the upper external border of the speculum is attached a small handle, which steadies the speculum and tends to keep it immobile while the cover is being removed or replaced. A watertight cover is fitted accurately to the outer end of the speculum. Through the centre of this cover passes the metallic afferent tube, terminating in a bulb having numerous small perforations. Below the afferent tube is a short efferent tube, which originates in the cover. To each of these tubes rubber tubing is attached; that of the afferent tube communicating with a vessel half a metre above the level of the vagina, containing the irrigat-

ing fluid; that of the efferent tube discharging into a vessel placed on the floor by the bed-side. The irrigating fluid passes down through the afferent tube, out through the holes in the speculum, irrigates the wound, fills up the speculum, and passes out through the efferent tube. To avoid any undue pressure upon the wound from too sudden an influx of fluid, or by the occlusion of the efferent tube by clots of blood or the débris of eliminated tissue, there is a hole in the cover above the afferent tube, through which the fluid may pass out when the speculum is entirely filled.

The disinfecting fluid used for permanent irrigation has been in all the cases on record, two of Billroth's and my own, a one-tenth of one per cent. solution of thymol. But there is no reason why a solution of salicylic acid, such as Volkmann makes use of after extirpations of the rectum, or of boracic acid might not be employed with as good results. Constant irrigation with a solution of carbolic acid cannot be recommended, even as an experiment, as it might prove dangerous by its absorption and the consequent carbolic acid poisoning.

In the afferent rubber tube, between the reservoir and the vaginal irrigator, it is well to have a stop-cock so as to regulate the influx of the irrigating fluid, which should be a rapid succession of drops and not a constant stream, as this would cause an unnecessary and inconvenient waste of the fluid, necessitating the too frequent refilling of the reservoir and consequent inconvenience to the nurse.

As Billroth, Mikulicz, and I applied the irrigator, we had to contend with several inconveniences, which should be avoided in the future. These inconveniences are the following: The patient was obliged to lie the whole time on a rubber bed-pan, because the whole amount of irrigating fluid was not carried away through the efferent tube, but some of it escaped through the reserve opening above the afferent tube and some of it passed out between the speculum and the vulva. Notwithstanding very careful nursing, and the intermittent emptying of the fluid in the bed-pan, it happened to us and always will happen, especially during the night, that the bed-pan overflowed and the whole of the bed got wet. As the bed and night clothing of the patient cannot conveniently be changed more than once or twice in the twenty-four hours, especially during the first days after the operation, the wetting of the sheets and the whole back of the patient was unavoidable. The consequence of this was acute eczemas on the back, accompanied by an itching which soon became very uncomfortable to the patient, causing not only loss of sleep, but also in all probability a slight rise in temperature. I think that these inconveniences may be avoided by using a bed-pan having an efferent tube, by means of which the bed-pan may be kept empty all the time.

But there is still another point. For some patients, mine for instance, it is inconvenient to remain all the time on a rubber bed-pan, when this is placed on the mattress, because the bed-pan being on a higher level than

the mattress surrounding it exercises an augmented pressure on the part of the sacrum that rests upon it, a pressure sufficient to cause, even in favourable cases, small superficial bed-sores, accompanied by considerable pain. I shall therefore, in future cases, have the bed-pan for permanent use situated in a fitting depression of the mattress, so as to make the upper surface of the bed-pan on a level with the latter. By precautions such as these just mentioned, I think it will be possible to keep the bed dry during the permanent irrigation.

The temperature of the irrigating fluid should be, as a rule, the temperature of the blood. In my own case the patient wished at times to have the fluid cooler. This request was attended to, and it appeared to relieve the pain in the wound.

As to the duration of the permanent irrigation: it has always been employed for about a week, within which time the peritoneal wound will be satisfactorily closed, and the vaginal wound granulating, so as to make the occurrence of any later absorption of septic matter impossible, and so as to render further constant irrigation unnecessary.

The cover of the vaginal irrigator should be removed three times a day for the removal of clots and portions of tissue sloughed off from the ligated lateral ligaments, and for the cleansing of the afferent and efferent tubes with five per cent. solution of carbolic acid. As any movement of the irrigator will cause the patient pain and consequently make her nervous before and after the removal of the cover, I have added, as mentioned above, a handle to Mikulicz's speculum, to make it possible to remove the cover without moving the vaginal tube in the least. The central end of Mikulicz's irrigator is cylindrical and cut off obliquely. For this oblique termination there is no use after the uterus has been removed, and the cylindrical end of the tube should rather be a transverse oval, because the wound in the peritoneum will always be transverse.

After having considered the advantages and disadvantages of the two methods of drainage and disinfection described above, I shall state as my opinion that I shall employ in future cases either of these methods, their use being based upon the following considerations: In common, uncomplicated cases, in which neither the bladder nor rectum has been opened, and in which there is no specific cause to fear septic inflammation, I shall make use of drainage-tubes, as Schröder does, but, of course, only for the vaginal wound, as I shall invariably insist upon the immediate uniting of the peritoneal wound.

In cases in which the bladder or rectum has been opened, I shall invariably employ constant irrigation, because we can never be sure, even after the most careful closure of openings into these organs, that the wounds will unite by first intention. We know from a number of cases on record in which openings in the intestines have been united with sutures, that escape of some fecal matter has frequently taken place, for a

short time, even in favourable cases. We know, further, that, after the *sectio alta* of the bladder, when performed with the most strenuous antiseptic precautions, in most cases a small quantity of urine escapes through the wound for a short time, followed by spontaneous closure of the small openings in the wound which had not united by first intention. Exactly the same imperfect union of the wound in the bladder by first intention occurred in my case, as has been shown in the history. The small fistula closed spontaneously in a little more than four weeks after the operation.

With these facts in view, it seems to me natural in such cases not to trust to drainage-tubes, with only periodical removal of the fluids and substances in and around the wound, but rather that constant irrigation is the only rational way to effect the removal of any urinary or fecal matter.

The opening of the bladder renders necessary certain especial measures, besides the treatment already mentioned. The main feature is the retention of a permanent catheter in the bladder. Without going too fully into details, I shall simply state that I have found the use of a soft elastic rubber catheter to be the most convenient. In the avoidance of irritation and subsequent cystitis by this procedure, I consider the following factors of great value: First: The washing out of the bladder once or twice daily with a lukewarm saturated solution of boracic acid. Second: The end of the catheter terminating directly or indirectly through a tube in a vessel filled with five per cent. solution of carbolic acid; by means of which only disinfected air can come in contact with the column of urine from the bladder. By careful attention to these precautions, I have been enabled in this as well as in other operations, perineal section, for example, to retain the permanent catheter in the bladder for more than two weeks without causing any irritation sufficient to necessitate its removal. Where the urethra is healthy, as in cases of extirpation of the uterus, I remove the catheter twice a day, in order to cleanse it by the use of five per cent. carbolic acid solution.

A permanent tube in the rectum, a large, soft rubber tube, with several holes cut in the sides, is of great help in the facilitation of the passage of the intestinal gases. It is needless to say that any accumulation of the latter, in cases of abdominal operations, causes great pain to the patient, which is speedily relieved by their escape. This tube should be taken out and cleaned every one or two days, as the mucous matter of the rectum becomes very tenacious, and will adhere to the tube and occlude the holes if not frequently removed.

As to passages from the bowels. It is natural that we desire to keep the bowels perfectly quiet until the peritoneal wound is entirely united. In common, uncomplicated cases, the bowels have been moved a week after the operation without inconvenience. In my own case I did not dare or wish to have the bowels moved until very late in the after-treatment, on account of the opening into the bladder, with a view of not dis-

turbing the healing of the latter if it could be avoided. As the history shows, I had no difficulty in postponing the movement of the bowels until even sixteen days after the operation, notwithstanding that the patient took considerable liquid food during the whole of the time, and, toward the latter part, even small quantities of solid food.

As for the medical treatment after the operation, I have very little to say in addition to what is already known from other abdominal operations. To keep the patient free from pain and restlessness I use hypodermic injections of one-sixth to one-fourth of a grain of morphia; moderate doses of quinia when a rise in temperature occurs; camphor and opium pills for the tenesmus and pain in the bladder; sub-nitrate of bismuth, with or without morphia, for pain in the cardiac region; and iced champagne and bits of ice for nausea.

The ligatures around the lateral ligaments will generally loosen and come off in the course of two or three weeks; sometimes one or more of them will remain for five or six weeks, as happened on one side in my own case. Inconveniences of this kind we may desire to avoid, and consequently, in cases in which the lateral ligaments are long enough, we should avoid the ligature *en masse* entirely. Local granulating nodules, especially in the lateral portions of the wound, may remain for a considerable time after operation. These may easily be made to heal by superficial cauterization with nitrate of silver, tincture of iodine, or similar agents.

If the course of the after-treatment is favourable, the patient will be able to be out of bed in three weeks, and up and around the house in four or five weeks. It is needless to state that during the convalescence, iron, wine, and food of the most nourishing character, should be given to those patients who are anæmic from constant loss of blood for months previous to operation; under this treatment the patients will gain strength rapidly.

IV. *Results and Remarks.*

We must naturally ask ourselves: Does suffering humanity gain anything by this operation? or, in other words: Does the operation enable us to save, or only to prolong life, and is it worth while for patients having uterine cancer to undergo this severe operation?

By total extirpation of the uterus, we desire to gain something more than the mere cessation of fetor and hemorrhage from the vagina, because we can obtain this by partial and very much less dangerous operations. We want to obtain perfect recovery if possible, or, at any rate, health for some years, to compensate for the serious operation.

In making a total extirpation of the uterus for cancer, we have the right to expect nothing more and nothing less than from the extirpation of cancer in other portions of the body. The immunity of the patient from a relapse of the cancer depends partly upon the anatomico-physiological characteristics of the malignant growth, and partly upon the successful re-

removal of all the diseased tissue by the operation. From the statistics of the cases operated upon, we learn that in about fifty per cent. of the cases, relapse of the cancer set in *in loco* within a few months after the operation, and in regard to the remainder, the successful operations, the period since the operations had been too short to admit of our learning anything about definite cure. We do not need to be reminded, however, that the removal of malignant tumours in almost any part of the body except the ovaries is, and has always been, regarded as a procedure which the surgeon undertakes rather as a kind of traditional duty, than from any hope of thereby gaining for the patient radical cure, or even, in all cases, a longer lease of healthy life.

The prospects for patients operated upon for cancer we have always considered very gloomy. We did not know the exact numerical expression of what benefit we might expect to derive from the extirpation of cancers, until the recent statistics of Winiwarter, from the material of Billroth, at Vienna; Oldekop, from Esmarch's material at Kiel, and Henry, from Fischer's material at Berlin, threw some light upon the subject. The extirpation of cancers of the mammary gland gave a permanent cure in nine per cent. of the cases. The statistics of twenty-nine cases of cancer of the tongue, pharynx, and rectum, reported by Kocher, gave thirty-one per cent. of radical cures.

Mikulicz is certainly right in expressing the hope, or rather the justifiable expectation, that modern surgery will enable us to ameliorate the statistics of the radical treatment of cancer, for the following reasons: We have now the right, aided by antiseptic surgery, to operate much more extensively; to have, I may say, no apprehensions as to the size, location, and extent of the wound inflicted, within the limits for operations on vital organs, established by anatomy and physiology, the transgression of which would cause immediate death. In other words, we need not care how near we come to vessels or nerves or the intestines, because we need be no longer afraid of endangering our patients' lives by secondary inflammations in such important organs, since it is in our power to prevent any and all such complications by sufficient skill and care.

We may consequently, in operating for cancer, do justice to one of the imperative conditions recognized from the olden time to be all-important, namely, the removal of every particle of diseased tissue, and expect in years to come to have a much larger proportion of permanent cures after the extirpation of cancers.

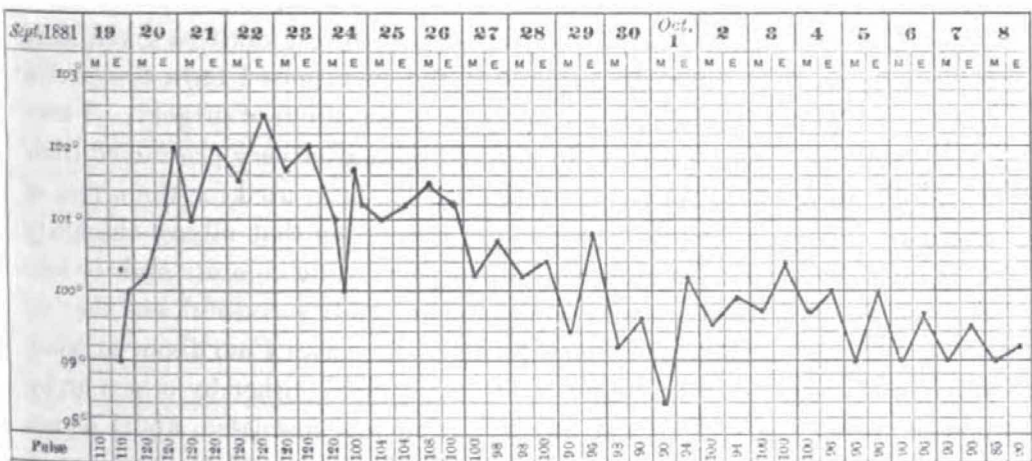
Now let us see how this applies to the total extirpation of the uterus through the vagina. If this operation were, or might be in the future made as safe as ovariectomy now is in the hands of the best operators, or, as might not unreasonably be expected, almost as safe as the supra-vaginal amputation, we might then be justified in preferring the former to the latter method, for the more effectual removal of all the diseased tissue.

The vaginal extirpation, for instance, enables us to remove the spread nodules and infiltrated lymph glands from the broad ligaments and the pelvic cellular tissue. But the operation has not yet reached such a degree of perfection and consequent safety, that we are justified in substituting it for the less dangerous supra-vaginal amputation, and so much the more as the latter counts among its results some cases of permanent recovery, besides the numerous cases in which the patient's condition was sufficiently ameliorated to give her a longer period of happy existence in her family, enabling her, for a time, to resume domestic duties.

On the other hand, the material existing, and the results so far obtained, have won for this operation a higher position than that accorded to it by John Erichsen, in his address before the Surgical Section of the International Medical Congress,¹ in which he chooses to designate such operations as "surgical triumphs or operative audacities, applied to the diagnosis or cure of diseases, in which but little of ultimate advantage, and, certainly, much of immediate peril may be expected from operative interference."

In natural science, we have no right to expect anything good or bad, without asking nature the right questions in the right terms. What the final answer to the question asked regarding the vaginal extirpation of the uterus for the cure of cancer will be, we do not know. But with sufficient skill and in careful hands this operation does not involve an amount of unavoidable danger considerable enough, to prevent us from being justified in resorting to it when indicated in a disease which we know to be necessarily fatal, and with full confidence in our ability to make the method of operation still more perfect, and so lessen its dangers—a result which can be obtained, not by sterile *à priori* reasonings as to the right of its existence, but only by an earnest and impartial trial.

The accompanying chart shows the temperature curve in my case (see page 19).



¹ Lancet, No. 6, vol. II, 1881, p. 227.