CHAPTER V

RELAXATION AND FISTULAE

of the Pelvic Floor, Perineum, External Genitals, and Vagina

Points in Anatomy

The term "pelvic floor" is applied to that group of structures which closes in the pelvic outlet and supports the organs above it. The principal supporting structures are the levator ani muscles and associated fasciae. They are indicated diagrammatically in Fig. 477. The levator ani muscles, arising from each side of the pelvis and joining in the median line, form a sling which holds up the vagina and rectum and at the same time holds their lower ends forward under the pubic arch.

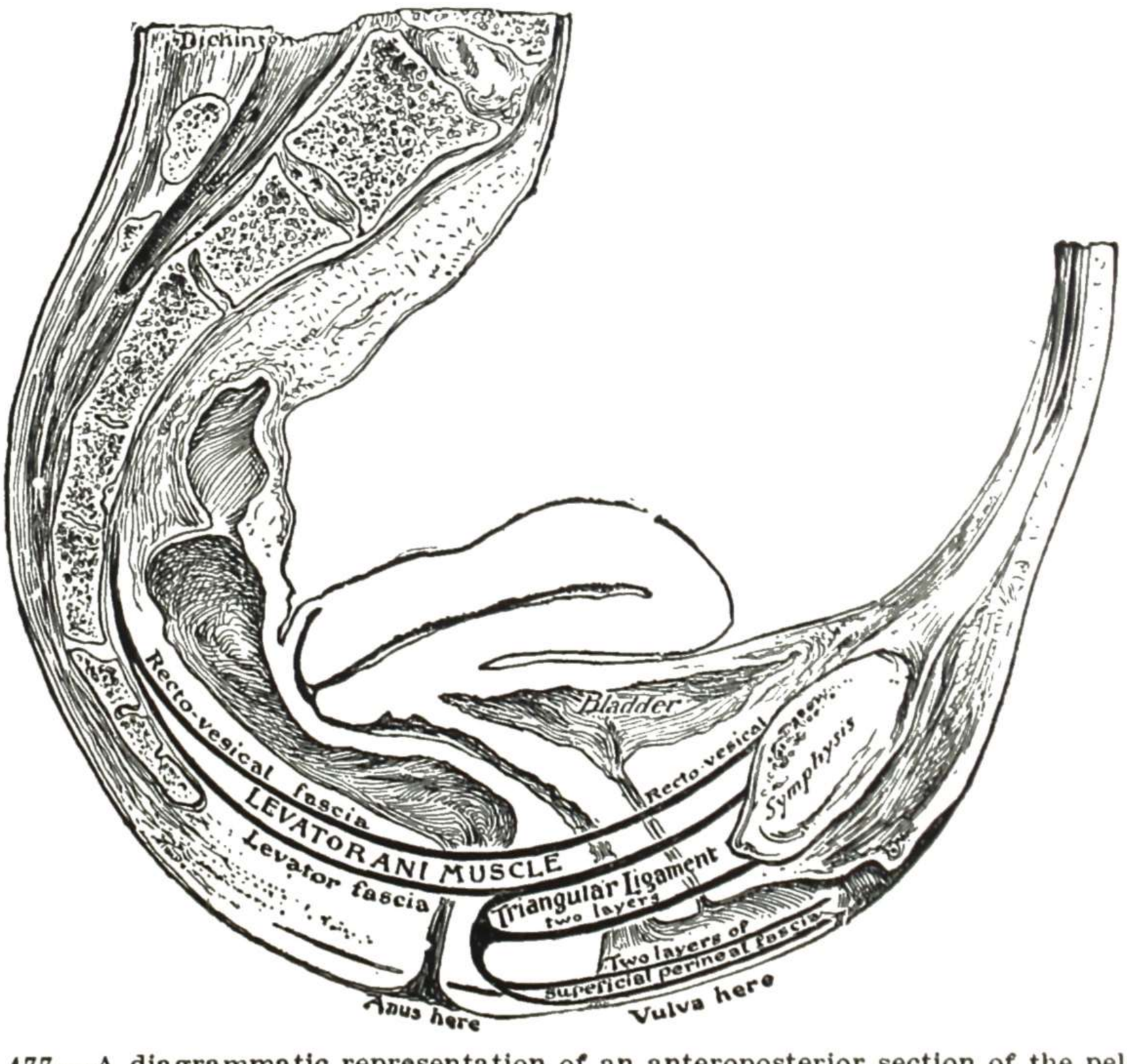


Fig. 477.—A diagrammatic representation of an anteroposterior section of the pelvis, showing the various fascial layers of the pelvic floor. (Dickinson—*American Textbook of Obstetrics.*)

Each levator ani muscles arises in front from the posterior surface of the pubic bone, behind from the spine of the ischium, and between these points from the "white line" that marks the division of the pelvic fascia. The anterior portion of the muscle passes downward and toward the median line and unites with a corresponding portion of the muscle of the opposite side. Some of the fibers unite with the lower part of the vagina, some with the lower part

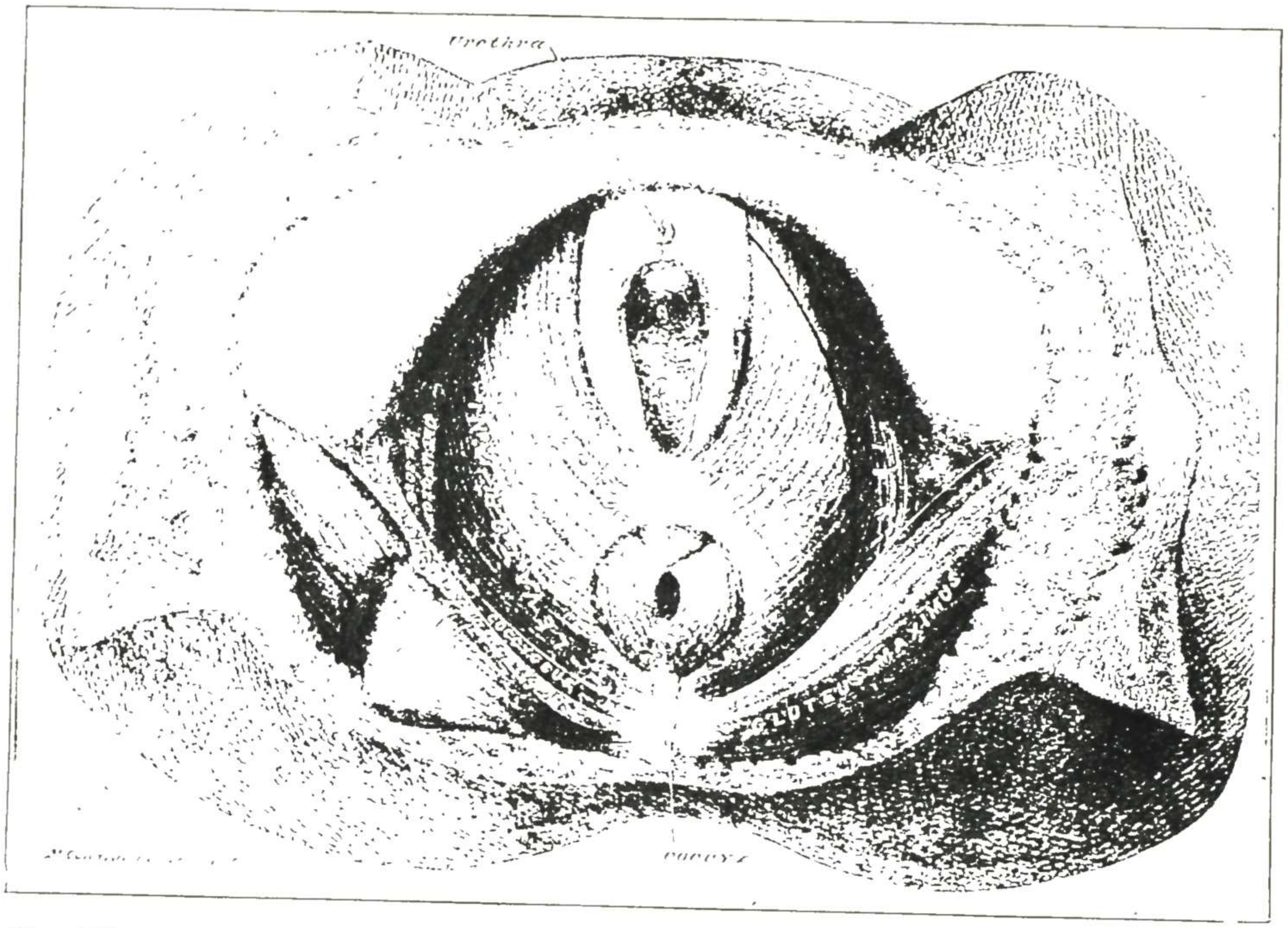


Fig. 478.—The superficial structures removed, exposing the levator ani and vaginae muscles. (Weisse—*Practical Human Anatomy.*)

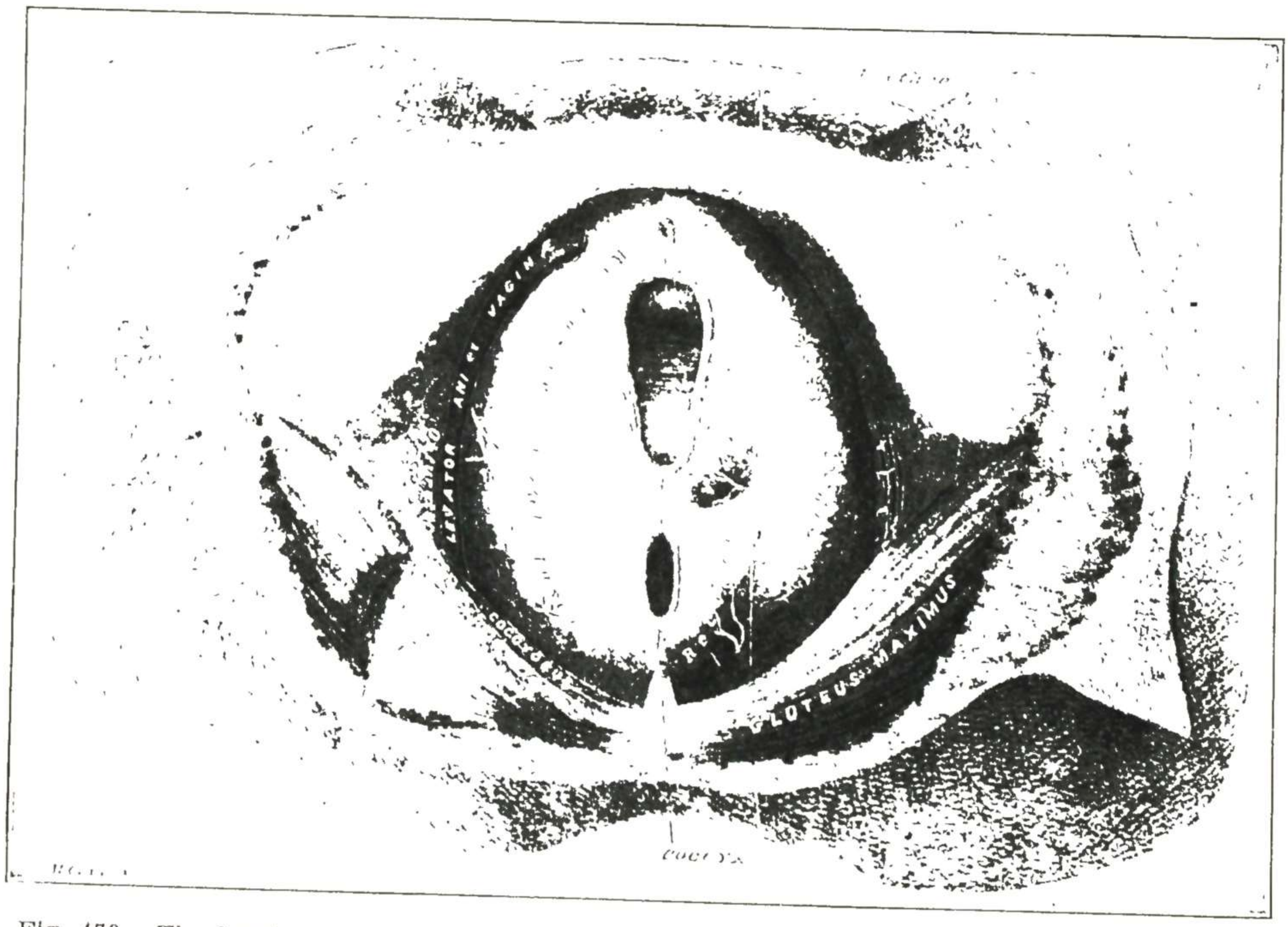


Fig. 479.—The levator ani muscles removed, exposing the strong rectovesical fascia. (Weisse—*Practical Human Anatomy.*)

of the rectum, some between the vagina and rectum, and many of them back of the rectum. The most posterior fibers of the muscle unite with the coccyx. Lying back of the posterior part of the levator ani muscle is the coccygeus muscle. The action of the levator muscles, in conjunction with the fascia above and below them, is to hold forward the lower end of the rectum and vagina close to the symphysis pubis, and at the same time to form a sling which closes the

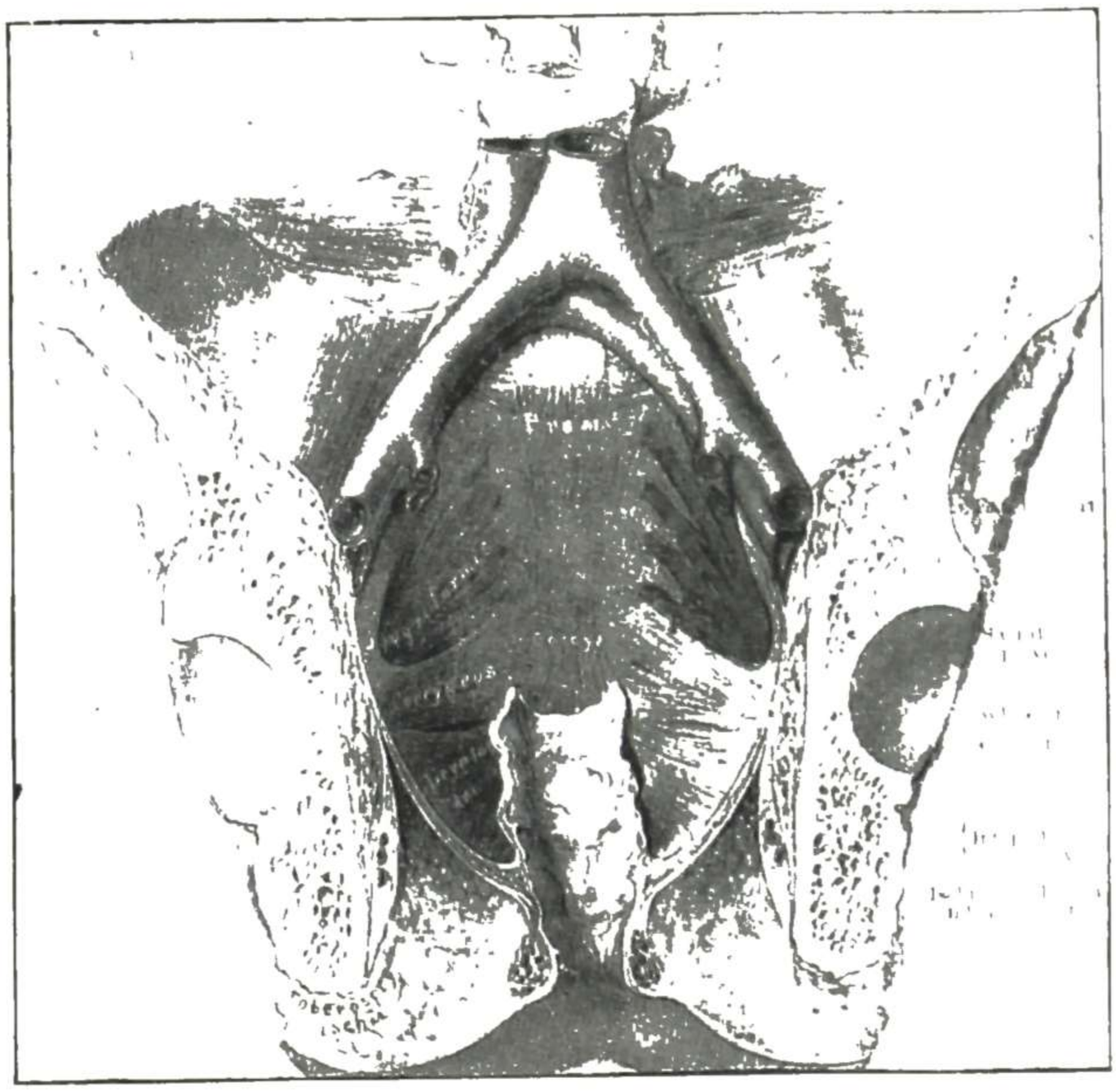


Fig. 480.—The pelvic sling. It is composed of the levator ani muscles and the fascia above and below them. Its attachment to the rectum is here shown but the vagina is not shown. (Kelly—*Operative Gynecology.*)

Fig. 481.

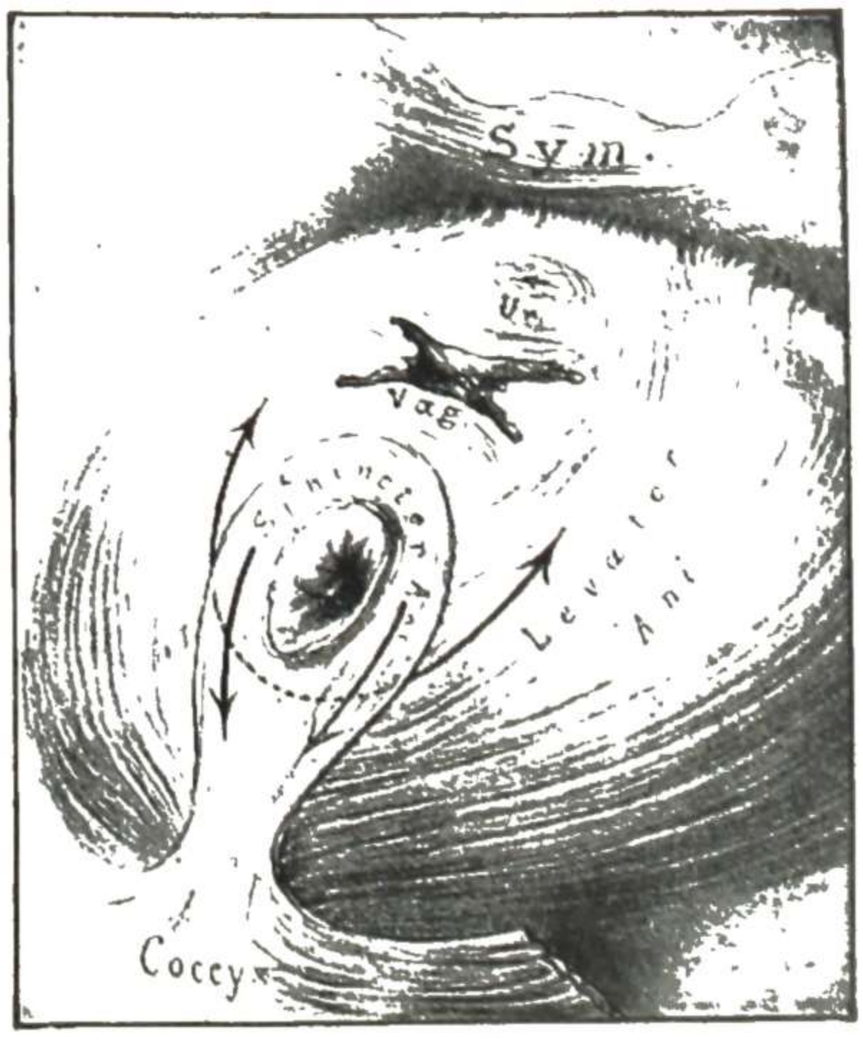


Fig. 586.

Fig. 481.—The pelvic sling, formed by the levator ani muscles. (Dickinson—*American Textbook of Obstetrics.*)

Fig. 482.—Actions of the pelvic sling. It tends to draw the vaginal opening and the anus forward under the pubic arch at the same time that it supports them. (Kelly—*Operative Gynecology.*)

pelvic outlet and supports the organs above (Figs. 478 to 482). Waldeyer has given this the very appropriate designation of "diaphragm of the pelvis."

When the muscles and fasciae are torn, the effect is twofold:

1. The sling is lengthened and does not furnish the support it previously did.

2. The vaginal and rectal openings (the weak places in the pelvic floor) are allowed to sink backward into the line of pressure, so that the weight from above, which formerly fell on the muscle and fascia, now falls on the openings.

The perineum is defined anatomically as the space at the pelvic outlet, its boundaries being formed by the bony and ligamentous margins. The soft structures closing this outlet are referred to collectively as the pelvic floor, the most important factor in pelvic floor support being the fibromuscular sling or diaphragm formed by the levator ani muscles and the fasciae immediately above and below them.

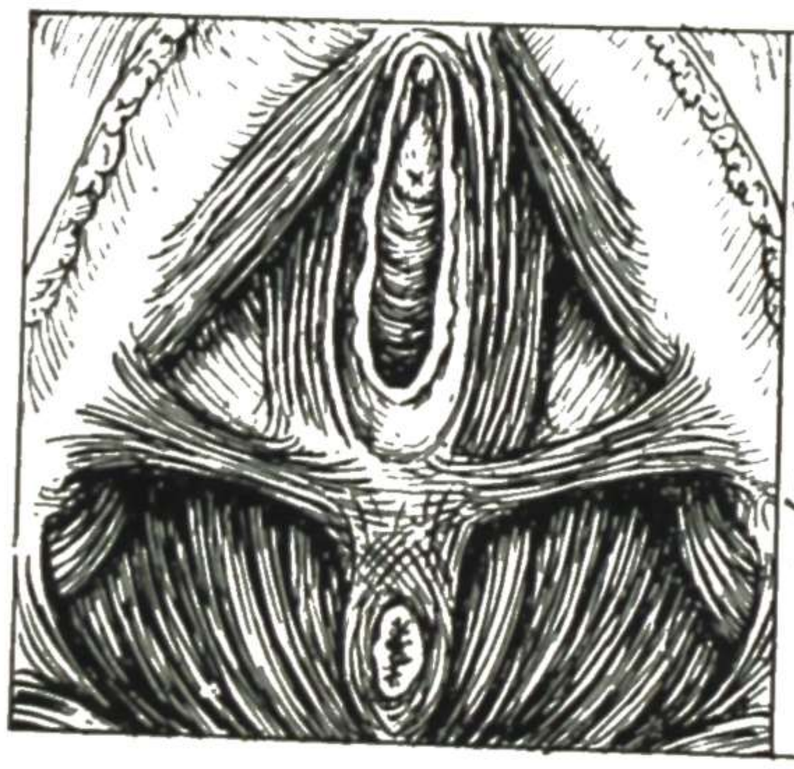


Fig. 483.

Fig. 484.

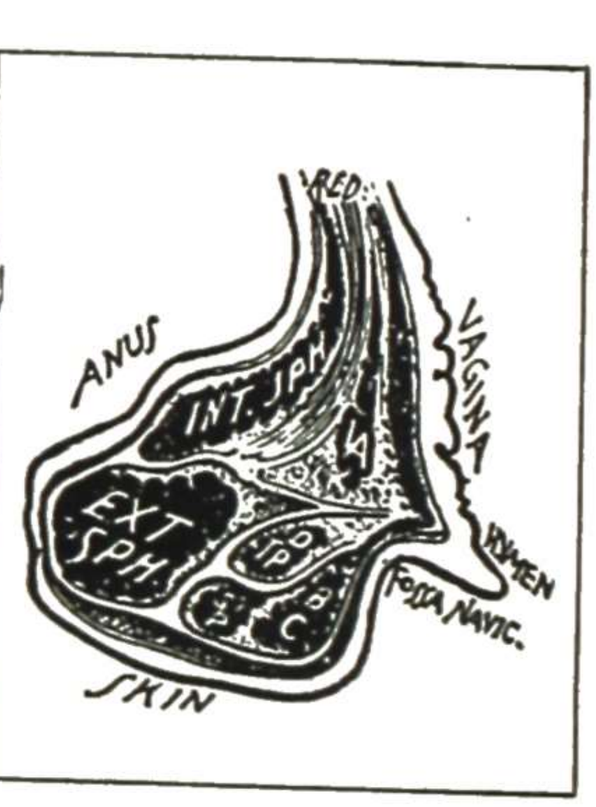


Fig. 485.

Figs. 483, 484, and 485.—Showing the perineal body, as seen on dissection and on cross section and with component parts labelled.

Several of the superficial muscles of the region meet at about the center of the perineal space, as shown in Fig. 483, and form there a rather firm body of tissue which lies between the lower end of the vagina and the rectum (Fig. 484). This is the perineal body, and the cross section in Fig. 485 indicates its structure. For convenience, the anatomical term "perineal body" is usually shortened to "perineum" in gynecological conversation and writings. Keeping in mind this gynecologic restriction when the term "perineum" is used should prevent any confusion with the strict anatomical definition as the entire space at the outlet of the bony pelvis.

Clinical and anatomical study have shown that the perineal body is not a large factor in pelvic support, the important supporting structures lying deeper, as above mentioned. Hence the expression "repair of perineum" is not a satisfactory descriptive term for repair of the supporting structures of the pelvic floor.

RELAXATION OF THE PELVIC FLOOR

For this common gynecologic condition, so frequently requiring operation, the authors prefer the term "relaxation" rather than "laceration," for the following reasons:

a. It is the presence or absence of relaxation that determines the necessity for treatment. Even though there is immediate repair and perfect healing of the laceration, there may, through subinvolution and lack of tone, be persisting relaxation requiring operation. Again, with an unrepaired laceration, the contraction of scar tissue and regaining of tone

may be sufficient to give good support, and there is no relaxation—hence, no cause for operation. The essential lesion, then, considered from the therapeutic standpoint, is the relaxation.

b. The term "laceration" as commonly used, and as interpreted by the patient, often works an injustice to the physician who took care of the patient during confinement. In a considerable proportion of cases the patient comes to the gynecologist with her mind poisoned against her former physician because some other physician has told her, bluntly and without qualification, that her present trouble is due to having been "torn in labor." The average patient interprets this as conclusive evidence of faulty care. In fact, she not infrequently begins her story with the statement that her trouble is due to neglect in confinement—this she knows because of having been informed that she was suffering from "a laceration."

Now, as a matter of fact, this wholesale condemnation is not warranted. Of course, in some cases the relaxation, for which the patient seeks relief, is really due to the fact that an extensive tear was not repaired at all or was repaired in a faulty manner. In a considerable proportion of the cases, however, the relaxation is due to entirely different causes. There may have been no open laceration, the overstretching having been accomplished by submucous lacerations (many or few) which could not even be located, much less repaired. Again, if pelvic floor involution is imperfect, as it often is in atonic patients, marked relaxation may result without there having been any definite alcerations, either open or submucous. This form of relaxation is especially likely to occur if the patient has repeated pregnancies at short intervals. Again, in certain cases, laceration or division of tissue must necessarily accompany delivery of the child. The wounds may fail to heal satisfactorily in spite of the utmost care. Again, a pelvic floor which is good two months after labor may be found greatly relaxed later, owing to displacement of the uterus or to heavy lifting (as of a heavy child) or to persistent straining or coughing associated with an atonic condition of the tissues. These facts are well known to every physician who has made a real study of the anatomy of the pelvis and of the physiology and pathology of parturition.

In view of the above facts, it is incumbent upon us to employ some term, for the condition under consideration, which does not in itself carry condemnation to the mind of the patient. "Relaxation" is such a term. It simply designates clearly the condition demanding relief, leaving open the question as to which one of the above-mentioned causes may have been present in that particular case.

Etiology

The usual cause of relaxation of the pelvic floor and perineum is **childbirth**. As the child's head passes through the pelvic outlet, the structures are greatly stretched and there is frequently more or less laceration (Figs. 486, 487).

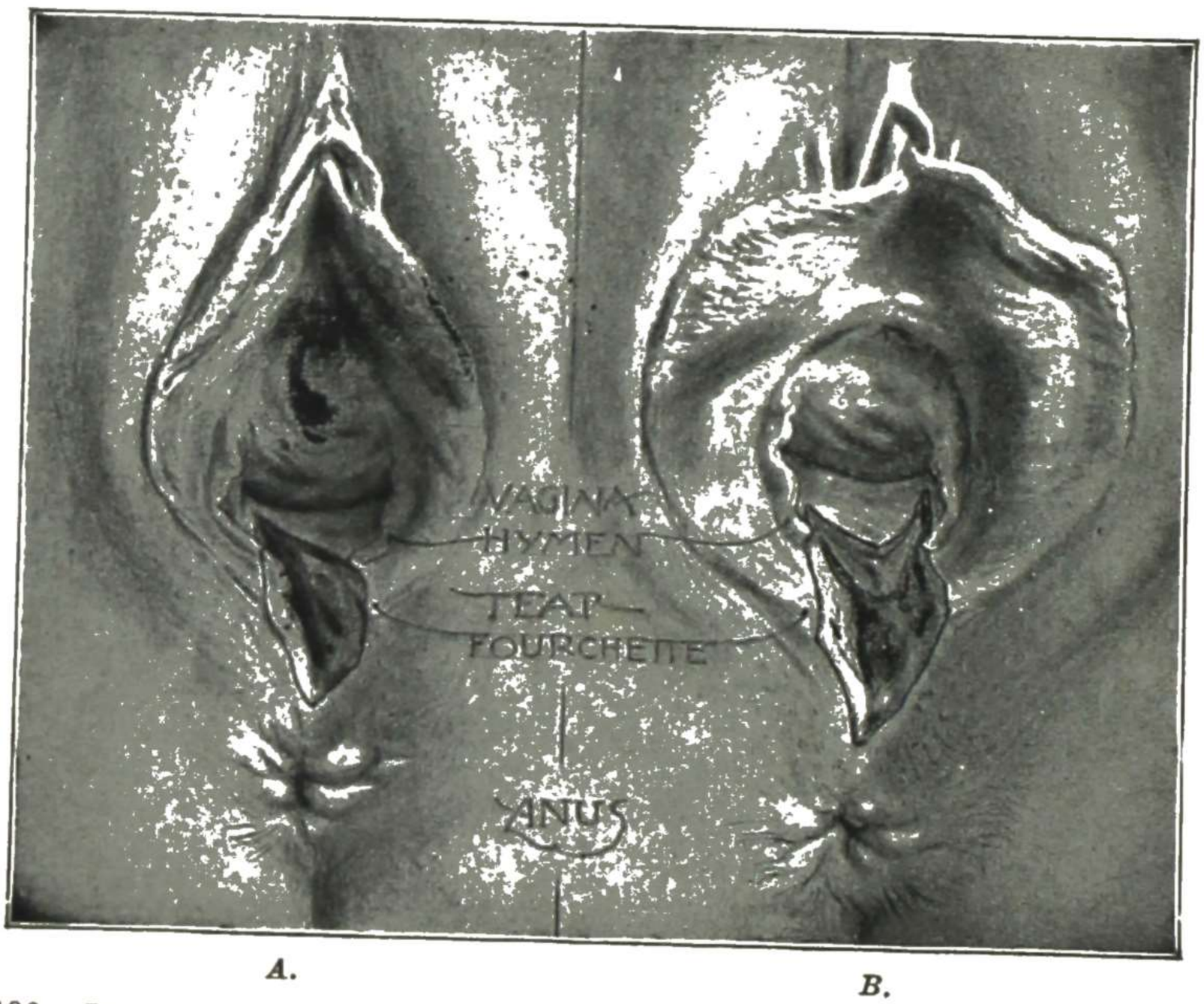
Subinvolution is a large factor. The markedly enlarged uterus and vagina and pelvic floor accompanying pregnancy and parturition must undergo the normal process of involution. If this process is not completed there remains an atonic relaxed condition. While subinvolution of the uterus is often mentioned, subinvolution of the vagina and pelvic floor is seldom thought of, though it is no doubt an important factor in many cases of relaxed floor.

An allied factor is the general atonic condition of many patients, which tends to retard normal involution and restoration of local tone after childbirth. Also, after repair, an atonic condition may permit restretching of the healed tissues.

Prophylaxis.—In a fresh laceration of the pelvic floor or perineum in labor, the rule is to repair the injury at once. Even though the tear is not deep enough to damage the pelvic floor, it should be repaired, for every laceration closed lessens to that extent the chance of infection. For the same reason,

tears of the anterior vaginal wall or of the vulva should be repaired at once. The details of this immediate repair belong to obstetric work, and need not be considered here.

To prevent subinvolution, certain steps in addition to surgical repair are employed in postpartum care; namely, knee-chest posture (to keep the heavy uterus forward and improve the circulation about it), special exercises to improve local muscular tone, and a general tonic regimen with frequent periods of recumbent rest to relieve the pressure and strain on the involuting structures. The knee-chest posture and special exercises must not be employed too soon after labor. See Chapter III.



A. *B.*

Fig. 486.—Recent lacerations in labor. *A*, Laceration involving the perineum and extending up the right vaginal sulcus. *B*. More severe laceration, involving the perineum and extending up both vaginal sulci. (Dickinson—*American Textbook of Obstetrics.*)

Diagnosis of Relaxed Floor

On inspection, it is found that, instead of a normal vaginal opening, the vaginal outlet is relaxed—that is, it is open and without tone or resistance (Fig. 488). The two index fingers introduced into the opening may be carried to the sides of the pubic arch with but little resistance. If now the patient be directed to bear down or strain, as in defecation, the sinking and protrusion of the parts become more marked and the relaxation of the floor is more apparent.

The relaxation is progressive, and leads to various complicating conditions. The cervix sinks into the pelvis and comes forward and the fundus uteri frequently goes backward into **retrodisplacement.** Also, the whole uterus lies too low in the pelvis, constituting **prolapse** of the uterus.

As the damaged pelvic floor and other supports of the uterus gradually stretch more, the uterus may sink so low that the cervix appears at the vaginal

opening. As the uterus sinks lower the vaginal opening enlarges and the vaginal walls roll outward, forming an anterior or posterior **colpocele.**

With the prolapsed posterior vaginal wall, sometimes the anterior wall of the rectum is found, forming a **rectocele** (Figs. 489 to 491). An appearance resembling rectocele may be produced by prolapse of a thickened vaginal wall. There is areolar hyperplasia and often considerable venous dilatation, giving quite a large projecting mass, but without displacement of the anterior rectal wall. Whether or not rectocele is really present is easily ascertained by rectal examination, to determine if the anterior rectal wall is pouched forward with the vaginal wall (Fig. 491, *A*). In some cases of rectocele a large pouch is formed and interferes much with emptying the rectum, it being necessary for the patient to push back the protruding rectocele to secure satisfactory bowel movement.

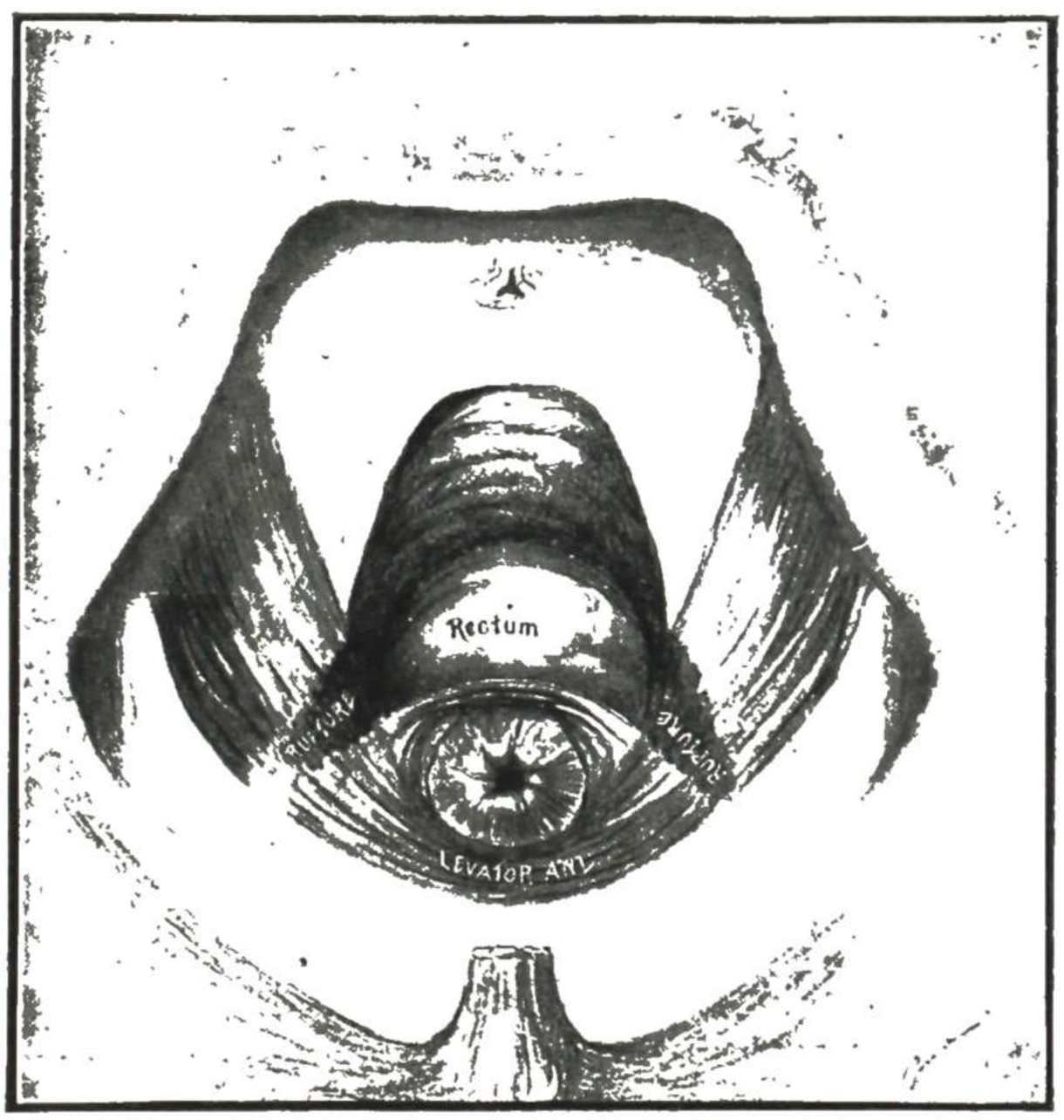


Fig. 487.

Fig. 488.

Fig. 487.—A deep laceration, extending up each vaginal sulcus and involving the pelvic sling on each side. (Gilliam—*Practical Gynecology*, F. A. Davis Company.)

Fig. 488.—An old laceration. (Baldy—*American Textbook of Gynecology.*)

If the base of the bladder follows the prolapsing anterior vaginal wall, the condition is known as **cystocele** (Fig. 491, *B*). Sometimes a supposed cystocele is found to be only vaginal wall. In marked cystocele, a large pouch is formed at the floor of the bladder, in which residual urine remains and decomposes, causing much bladder irritation. It is sometimes necessary for the patient to push back the protruding cystocele before a satisfactory evacuation of the bladder can be secured. Straining at defecation or urination greatly aggravates the cystocele. In some cases both rectocele and cystocele are present (Figs. 489, 490).

The patient complains of dragging weight on the pelvis, of a feeling of weakness at the vaginal outlet, as though the parts were coming down and

out, and usually of backache across the sacral region. The symptoms come principally when the patient has been on her feet some time.

When the vaginal entrance is relaxed, air can enter the vagina, and it is sometimes expelled with more or less noise, which is very annoying to the patient. This phenomenon is known as "flatus vaginalis." It is merely a symptom of relaxed vaginal orifice. It was formerly described under the queer title of "garrulity of the vulva."

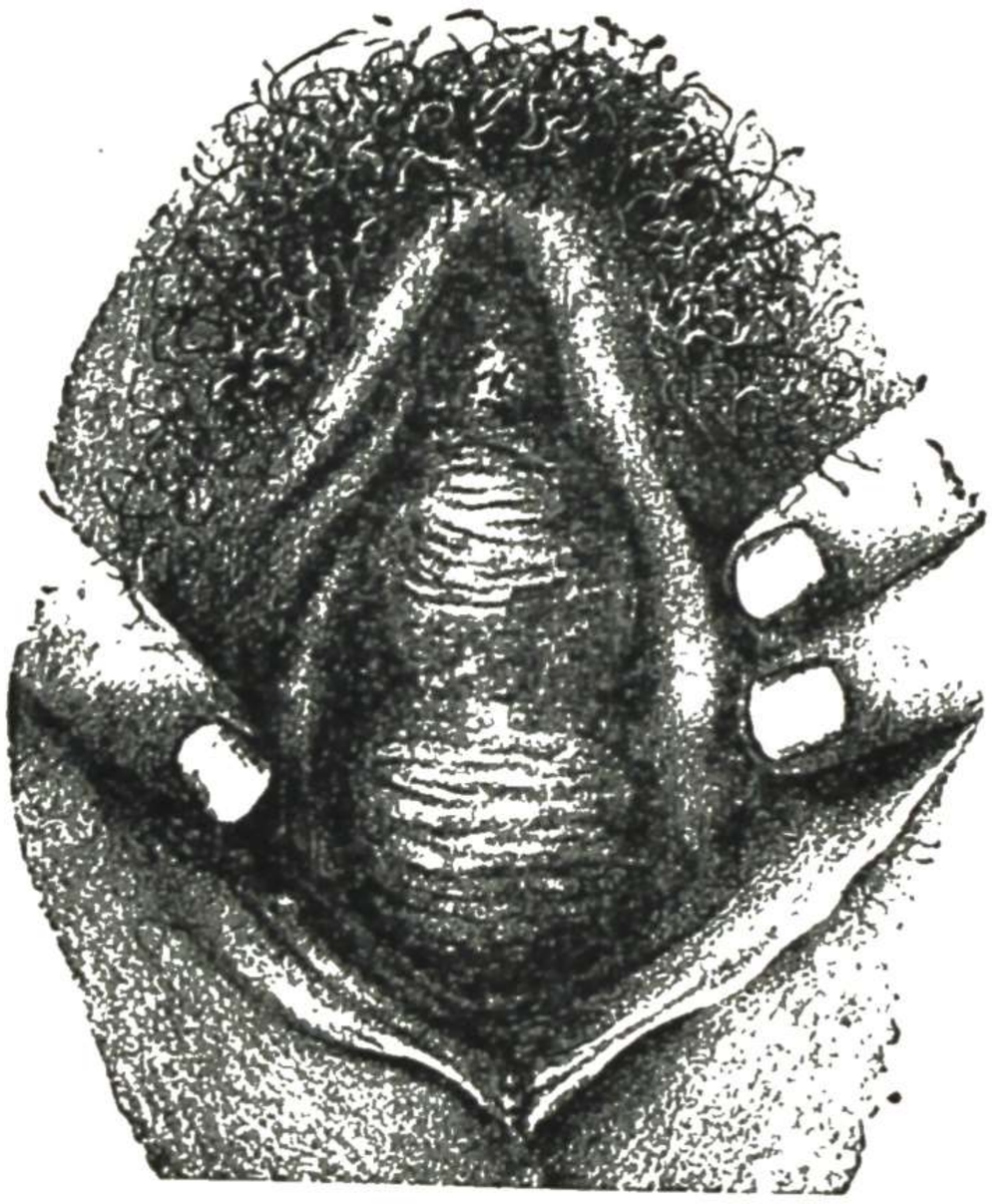


Fig. 489.

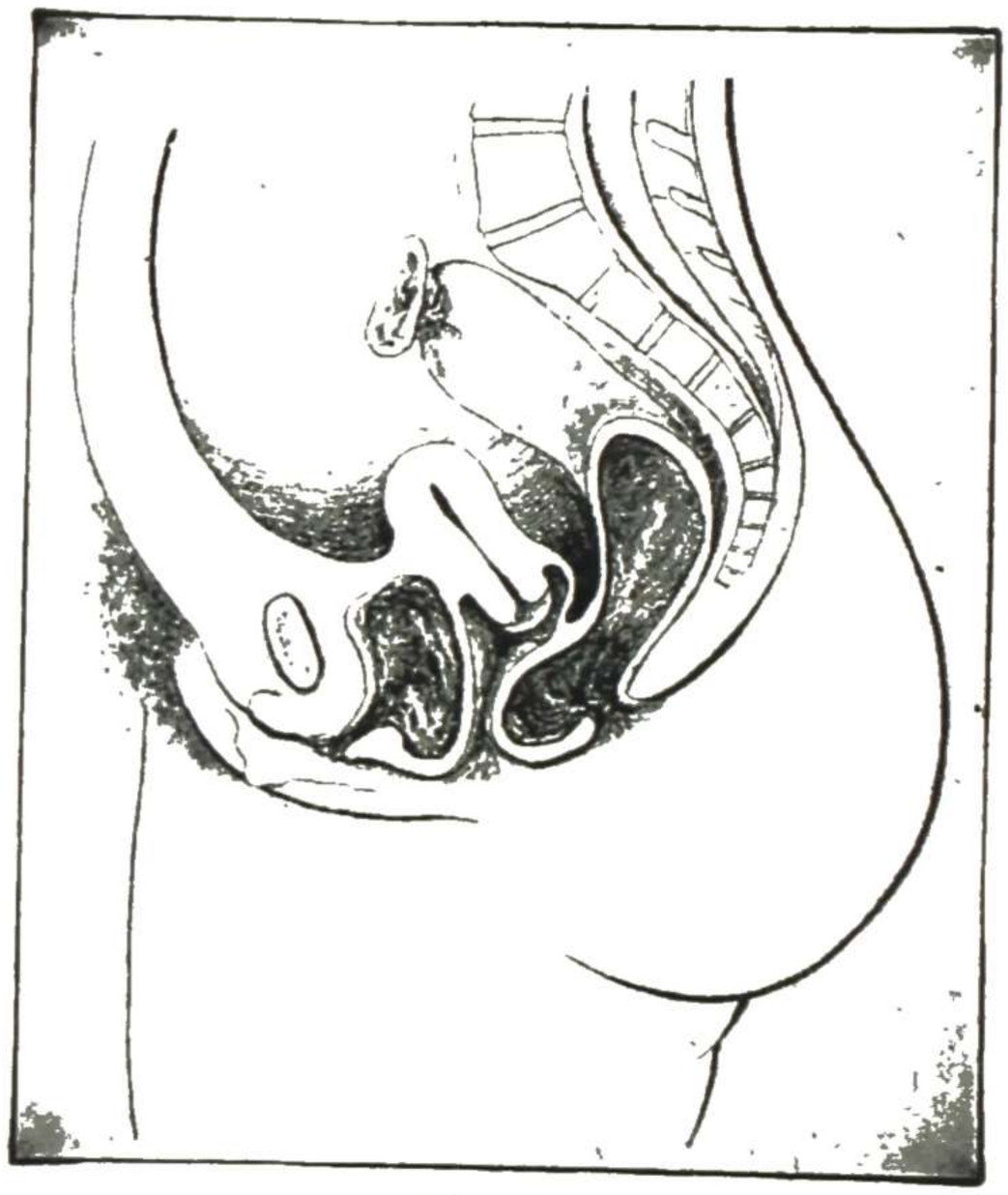
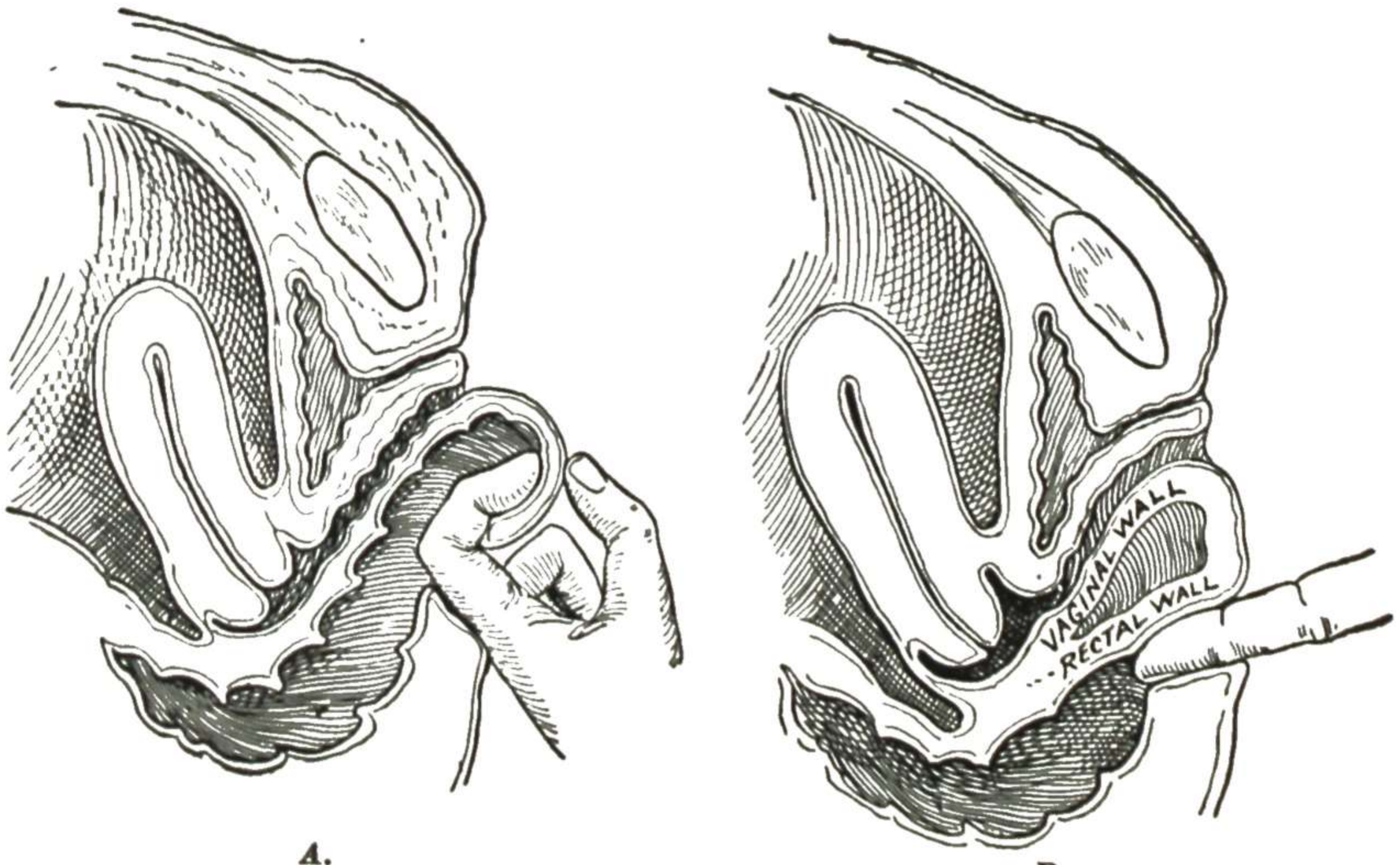


Fig. 490.

Fig. 489.—Cystocele and rectocele of moderate extent. (Thomas and Munde—*Diseases of Women.*)

Fig. 490.—Cystocele and rectocele of moderate extent. Sectional view. (Thomas and Munde—*Diseases of Women.*)



A. *B.*

Fig. 491.—Method of differentiating between rectocele and posterior colpocele. The index finger in the rectum determines whether or not the rectal wall follows the prolapsing vaginal wall. The hand should be gloved. *A*, rectocele; *B*, no rectocele. (Ashton—*Practice of Gynecology*, W. B. Saunders Company.)

Complications

In relaxation of the pelvic floor, there are frequently present vaginal discharge, painful menstruation, irregular menstruation, excessive menstruation, attacks of severe pelvic pain, dyspareunia, sterility, abortion, backache and dragging, and general poor health. These symptoms, however, are due principally to **associated diseases**, some of which may be traced to the laceration. The diseases frequently associated with relaxation of the pelvic floor are chronic cervicitis, subinvolution of uterus, endometrial hyperplasia, retrodisplacement of uterus, prolapsus uteri, parametritis, chronic salpingo-oophoritis.

All lesions present should be found and their severity determined before operative treatment is undertaken.

Treatment

Operative treatment is required when the relaxation is causing troublesome symptoms. But it is important to be certain that the troublesome symptoms are really due to the relaxation, and not to something else. Patients waiting for operation, or inoperable cases, may sometimes be made more comfortable by one of the pessaries used in retrodisplacement or in prolapse. Astringent douches, and recumbent rest several times daily, also help.

Object of the Operation.—The object of the operation is to restore a strong sling across the pelvic outlet to support the organs above. To restore the integrity of the pelvic floor, the following two things must be accomplished:

1. The musculofibrous pelvic sling must be shortened so that the slack is taken up.

2. The vaginal opening (the necessarily weak place in the pelvic floor) must be brought forward under the pubic arch and, consequently, out of the line of direct pressure from above.

Repairing the perineum is known as "perineorrhaphy." Suturing the vaginal wall is designated as "colporrhaphy."

Though the literal meaning of each of these terms is limited, they are frequently used to indicate the general suturing necessary in these cases. A more accurate and comprehensive designation for this operation is "repair of the pelvic floor." This operation comes under the general class known as "plastic operations," which includes also operation for cystocele and closure of fistulae and certain prolapse operations.

Methods of Shortening Sling.—The treatment of relaxation of the pelvic floor consists in taking up the slack, so that the pelvic sling is sufficiently shortened, and in restoring the perineal body, so as to carry the weak place in the pelvic floor (the vaginal opening) forward, out of the line of direct pressure.

The pelvic sling, the strong supporting part of the pelvic floor, consists of the levator ani muscles and the fascia above and below. This musculo-fibrous sling or diaphragm is the structure worked upon in repair of the pelvic floor. Shortening of this sling restores the pelvic-floor support, while if there is no shortening of the sling there is no lasting restoration of support.

Steps in Pelvic Floor Repair

Details of the operative steps for the ordinary relaxation operation are as follows:

1. Planning the Restored Vaginal Opening.—By careful examination of the vaginal entrance, the opening of the duct of the vulvovaginal gland may be identified on each side. Just below this on each side, at the point marked (x) in Fig. 492, the tissue should be caught firmly with the Allis forceps.

It is well to keep away from the vulvovaginal glands, if practicable, by keeping the incision below, or extending it inside if necessary to go higher. If, however, there are tender tags or infiltrated areas, they should be included in the operative incision.

Fig. 492.

Fig. 493.

Fig. 492.—The location of the incision for opening the pelvic floor. The authors prefer to place the incision well within the vaginal opening, as indicated by the heavy black line. The cross (x) on each side indicates the area to be caught by the forceps. Notice that the incision is well below the opening of the vulvovaginal gland on each side, which is indicated by the black dot. Allis forceps are most satisfactory for catching the sides.

Fig. 493.—Opening the pelvic floor by excising a strip of tissue.

(This series of operative drawings is from Crossen and Crossen—*Operative Gynecology.*)

2. Opening the Pelvic Floor.—The incision extends from one forceps to the other (Fig. 493). It should be placed well within the vagina as indicated by the dark line in Fig. 492. When so placed it is farther removed from the rectum, and hence from infection, and is in tissue less sensitive than the perineal skin. The floor may be conveniently opened by clipping off a line of tissue with the scissors, as shown in Fig. 493.

After the line of opening is made, the margin of the flap is bared by knife or scissors and then caught with a T-forceps (Fig. 494). With the gauze-covered finger, the loose connective tissue is quickly rolled off the vaginal flap (Figs. 495 to 497), as high as necessary to make good repair in that case and to take care of any rectocele that may be present.

Care must, of course, be exercised to avoid tearing into the rectum. The layer of veins constitutes the guide to safety. As long as the line of cleavage is kept between these veins and the vaginal wall, the rectum is safe. On the other hand, when the veins are permitted to remain on the vaginal flap, the line of cleavage is going too deeply and a hole may be torn into the rectum at any time.

3. Identification of the Musculofibrous Sling.—When the vaginal flap has been raised sufficiently, it is time for the exposure of the pelvic sling. This sling consists of the levator

ani muscle on each side and the overlying rectovesical fascia which forms its upper sheath. Both the fascia and the muscle should be included in the sutures, but it is not necessary to expose the muscle. Exposure and identification of the fascia enable the operator to include the fascia and the underlying muscle in the sutures.

The fascial surface of the pelvic sling is exposed by a combination of two simple maneuvers—(a) the vaginal flap is separated laterally well out to the pelvic wall and (b) the loose connective tissue over the sloping fascial plane is pushed off by a twisting motion

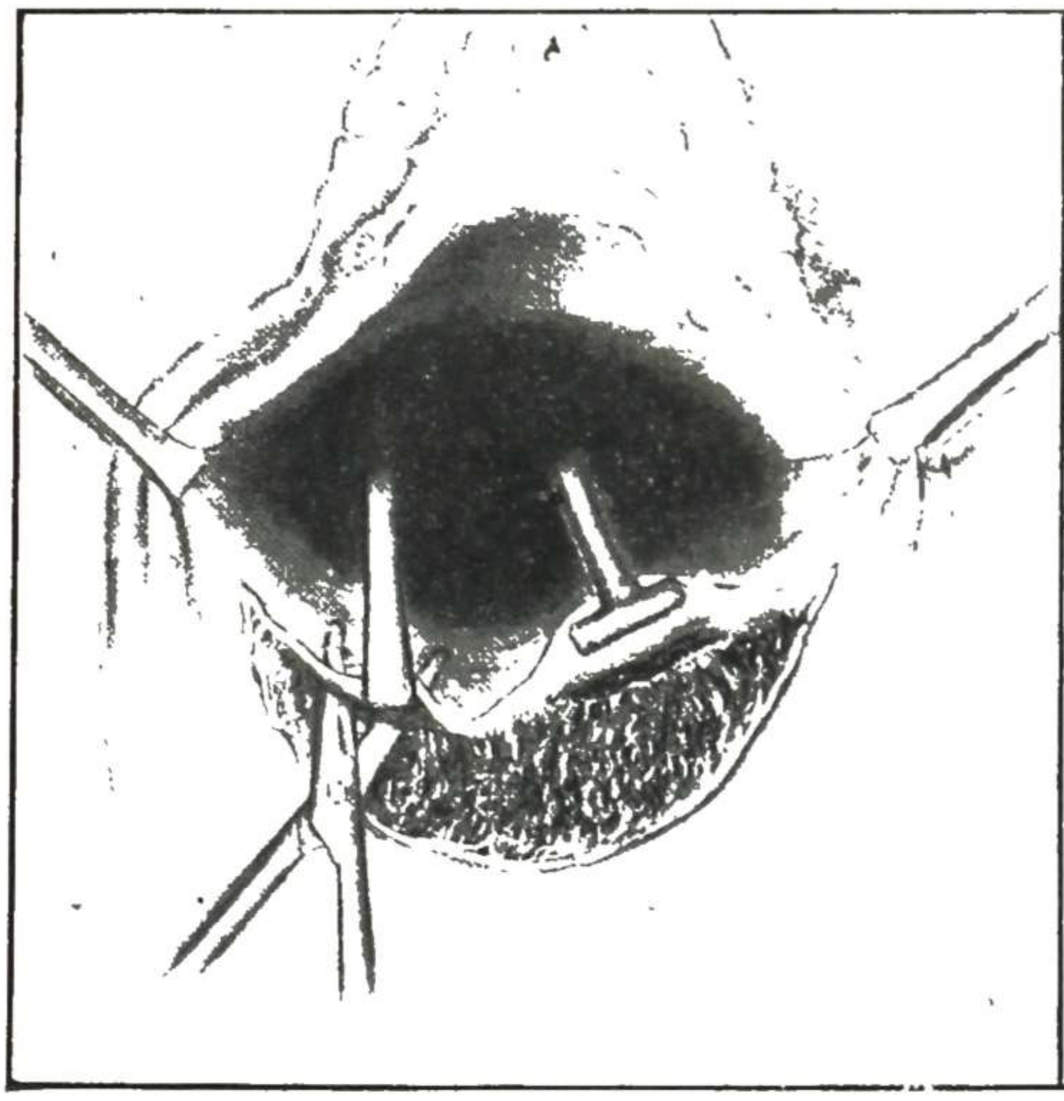


Fig. 494.

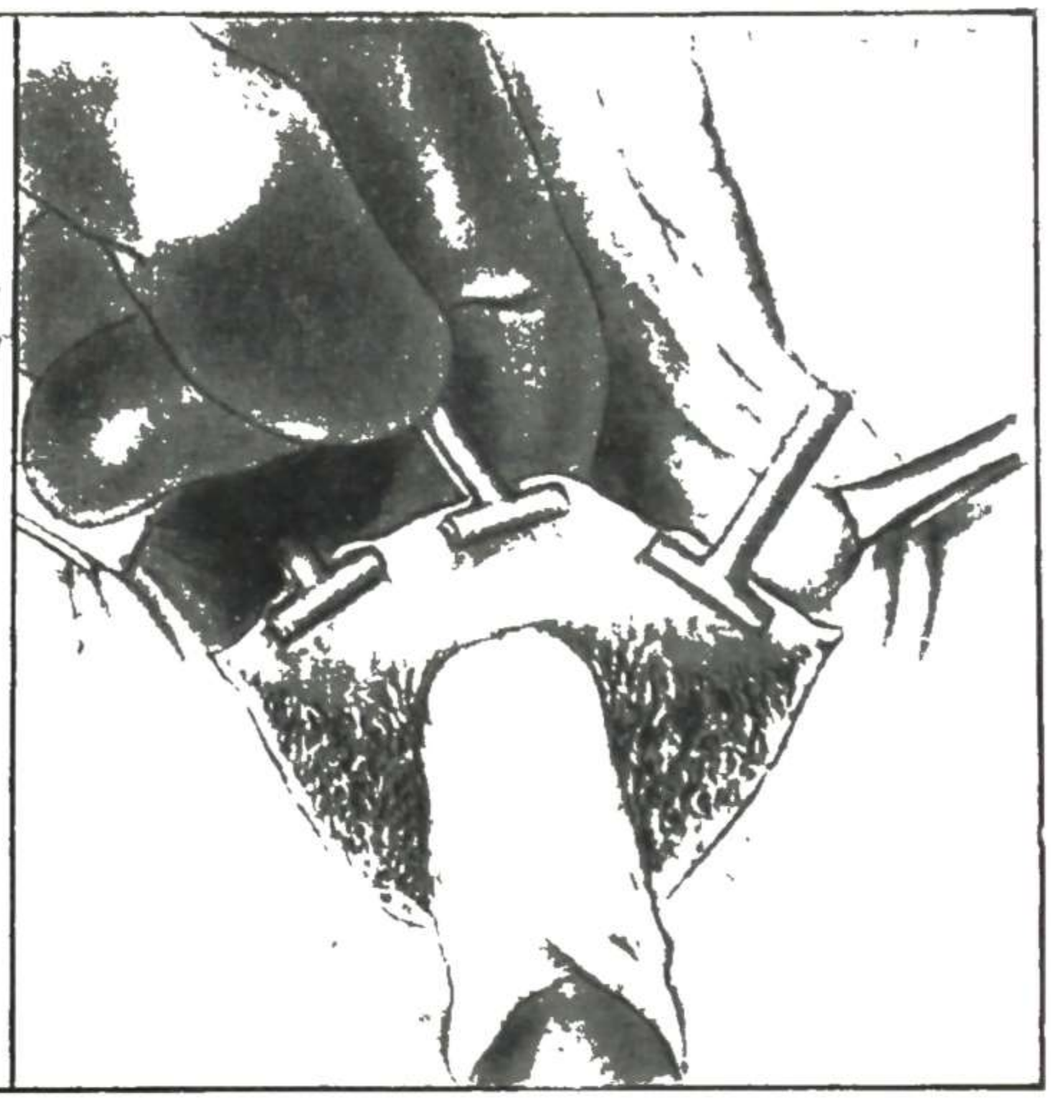


Fig. 495.

Fig. 494.—Freeing the vaginal flap on each side so it may be caught with the T-forceps. This may be quickly accomplished by thrusting in the closed scissors point against the vaginal wall and then opening the scissors. The maneuver has been carried out at the left side of the flap and the T-forceps applied, and the same maneuver is in progress on the right side.

Fig. 495.—Rolling off the underlying tissues from the vaginal wall with the gauze-covered finger. The motion is that of a push and a roll combined, and is made against the left forefinger which furnishes the counterpressure. As long as the dissection is kept close enough to the vaginal wall to push off the veins, there is no danger of injury to the rectum. When noticeable blood vessels are left on the wall, the dissection is progressing toward the rectum.

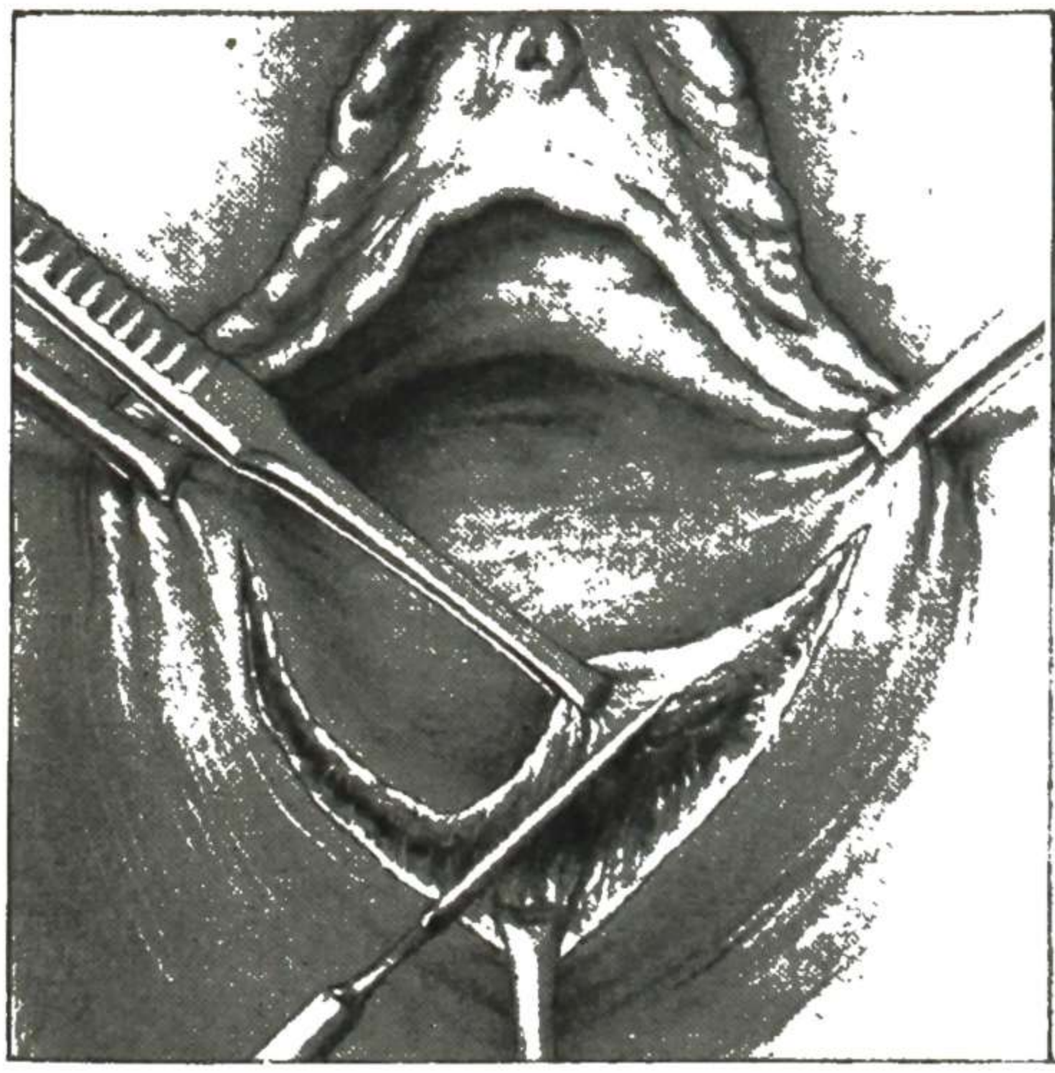


Fig. 496.

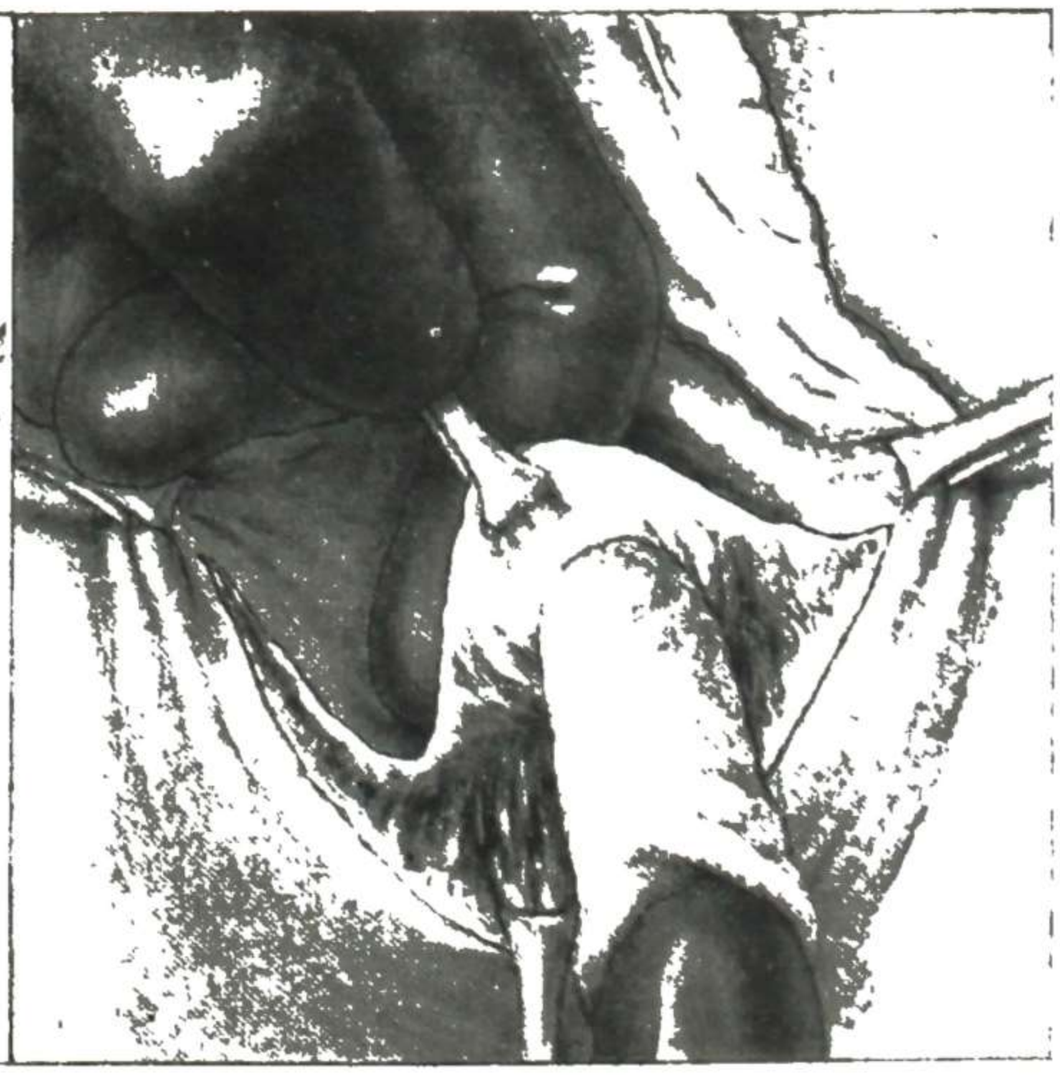


Fig. 497.

Fig. 496.—If preferred, the floor may be opened by incision and the edge of the vaginal flap freed with a knife.

Fig. 497.—Next the underlying tissues are pushed off with the gauze-covered finger from the vaginal wall which is held tightly stretched over the index finger of the left hand.

of the gauze-covered finger. It is important that the vaginal flap be separated entirely out to the lateral wall (Fig. 498) before trying to bare the fascia, otherwise the twisting finger will not be near enough to the fascia to expose it. The location of the gauze-covered finger and the direction of the pushing-twisting motion for clearing the loose connective tissue from the fascia are shown in Fig. 498.

When the surface of the fascia is exposed, it is identified by its smoothness in contrast to the loose connective tissue around it (Fig. 499). Also when picked up with an Allis forceps or small tenaculum forceps (Fig. 500), it presents the firm substance of fascia with underlying muscle, instead of loose connective tissue. The sling surface is exposed on both sides preparatory to suturing, as shown in Fig. 500.

Fig. 498.

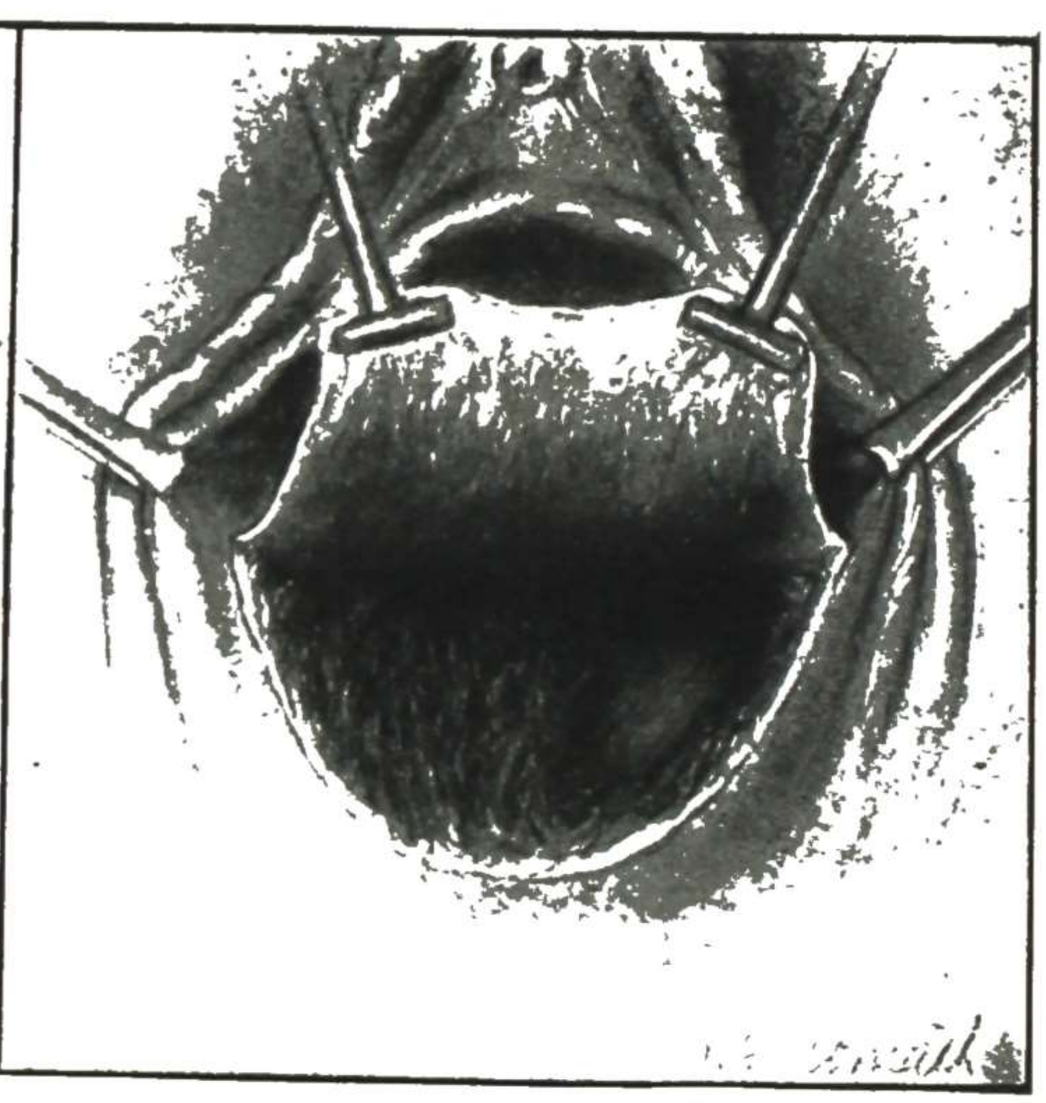


Fig. 499.

Fig. 498.—The vaginal flap has been raised well out to the side wall, and the gauze-covered finger is in place for rolling off the loose connective tissue from the fascial surface of the musculofascial levator sling. The loose connective tissue is easily pushed off by a pushing-rolling motion of the finger in the direction indicated by the curved arrow.

Fig. 499.—The fascial surface of the sling exposed on the left side. Its smooth, firm surface distinguishes it from the surrounding loose connective tissue.

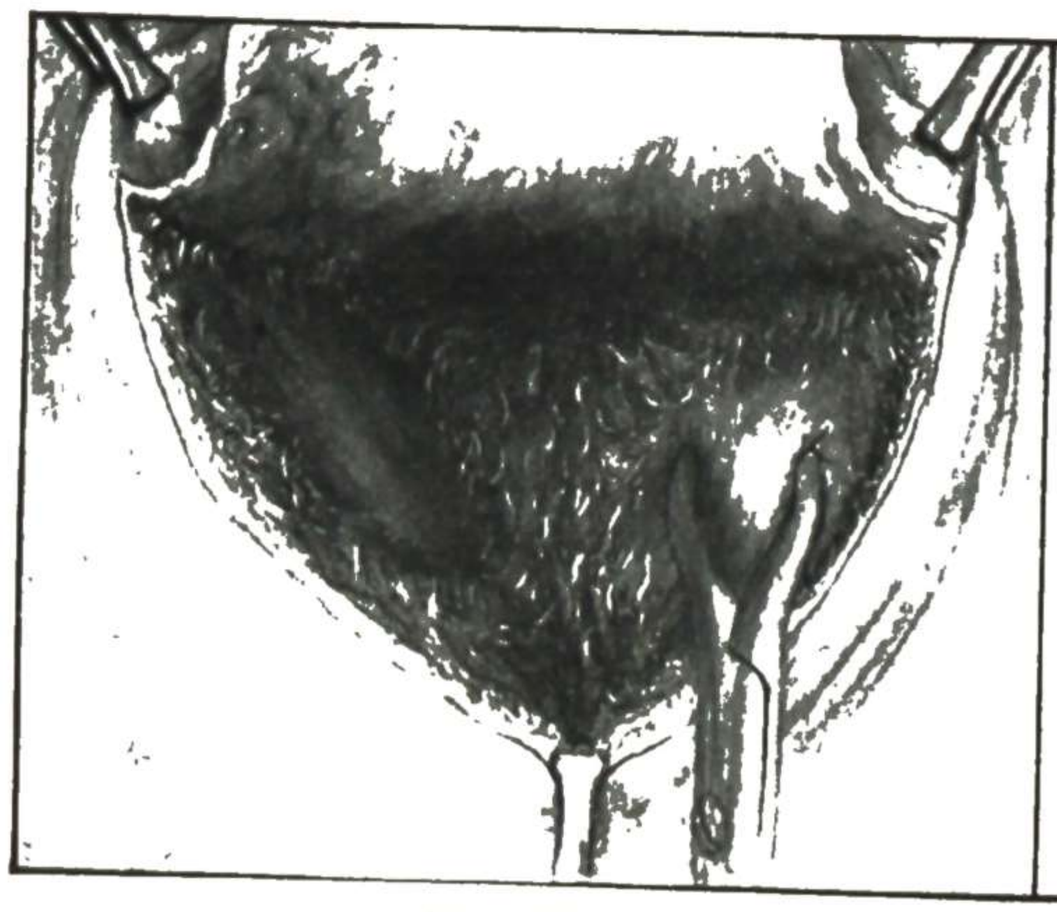


Fig. 500.

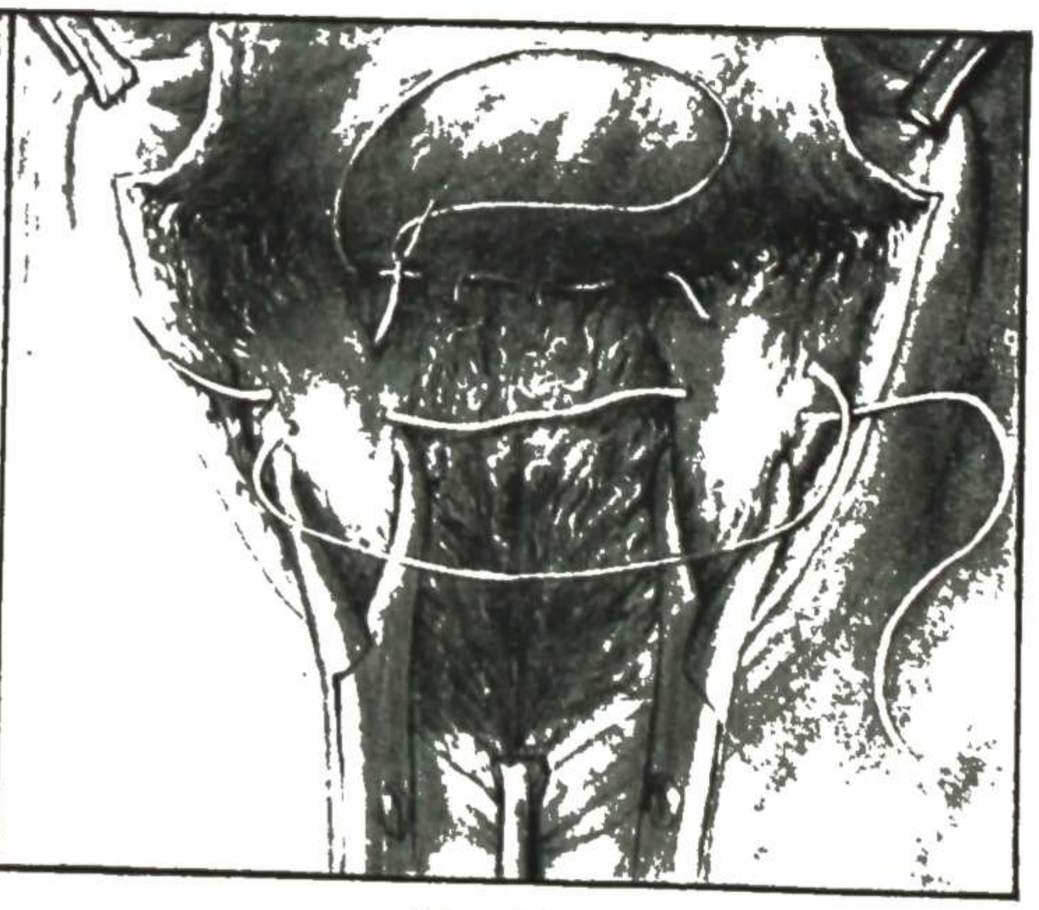


Fig. 501.

Fig. 500.—The surface of the musculofascial sling caught with forceps on the left side and raised for better identification and accurate passing of suture. If preferred, the sling may simply be picked up with the needle as the suture is passed, without demonstrating it with the forceps.

Fig. 501.—The first suture passed for subvaginal approximation of the sides of the musculofascial levator sling. It is well to make two rounds with this first suture, the second round including the loose tissue at the base of the vaginal flap, which tends to prevent later bleeding.

4. Approximating the Sides of the Sling.—The exposed sides of the sling are to be fastened securely together by sutures. It is well to pass the first suture around twice before tying, as indicated in Fig. 501. The upper round includes the connective tissue at the base of the vaginal flap. This is the tissue most likely to bleed, and it cannot be reached for suturing after the approximating suture is tied—hence, the advisability of including it in this first suture.

When this first suture is tied, it makes subvaginal approximation of the sides of the sling at the highest point, and narrows the vaginal lumen accordingly. It is well at this stage to *test the narrowing* to see whether it is too little or too much. The flap is dropped and three finger tips are introduced into the narrowed lumen, as shown in Fig. 502. At this stage of the operation the narrowed area should admit three finger tips easily. It is narrowed somewhat further by the additional deep suturing, but at the end of the operation the lumen should be large enough easily to admit two fingers deeply (Fig. 503). If on testing after the first suture is tied, the lumen is found still too loose, another bite is taken above the first. If the test shows the lumen too small, the first suture is removed and another introduced somewhat lower in the sling.

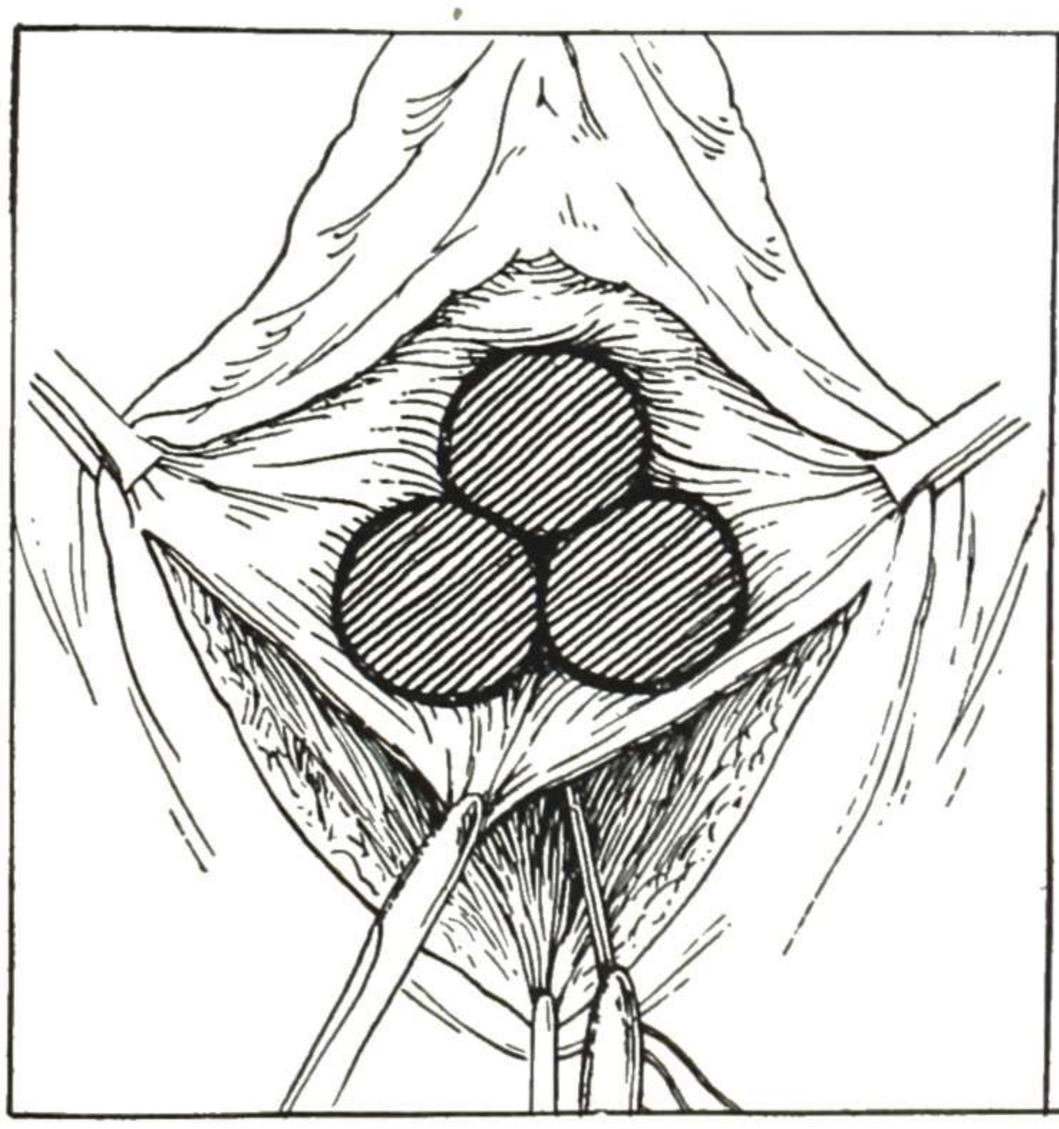


Fig. 502.

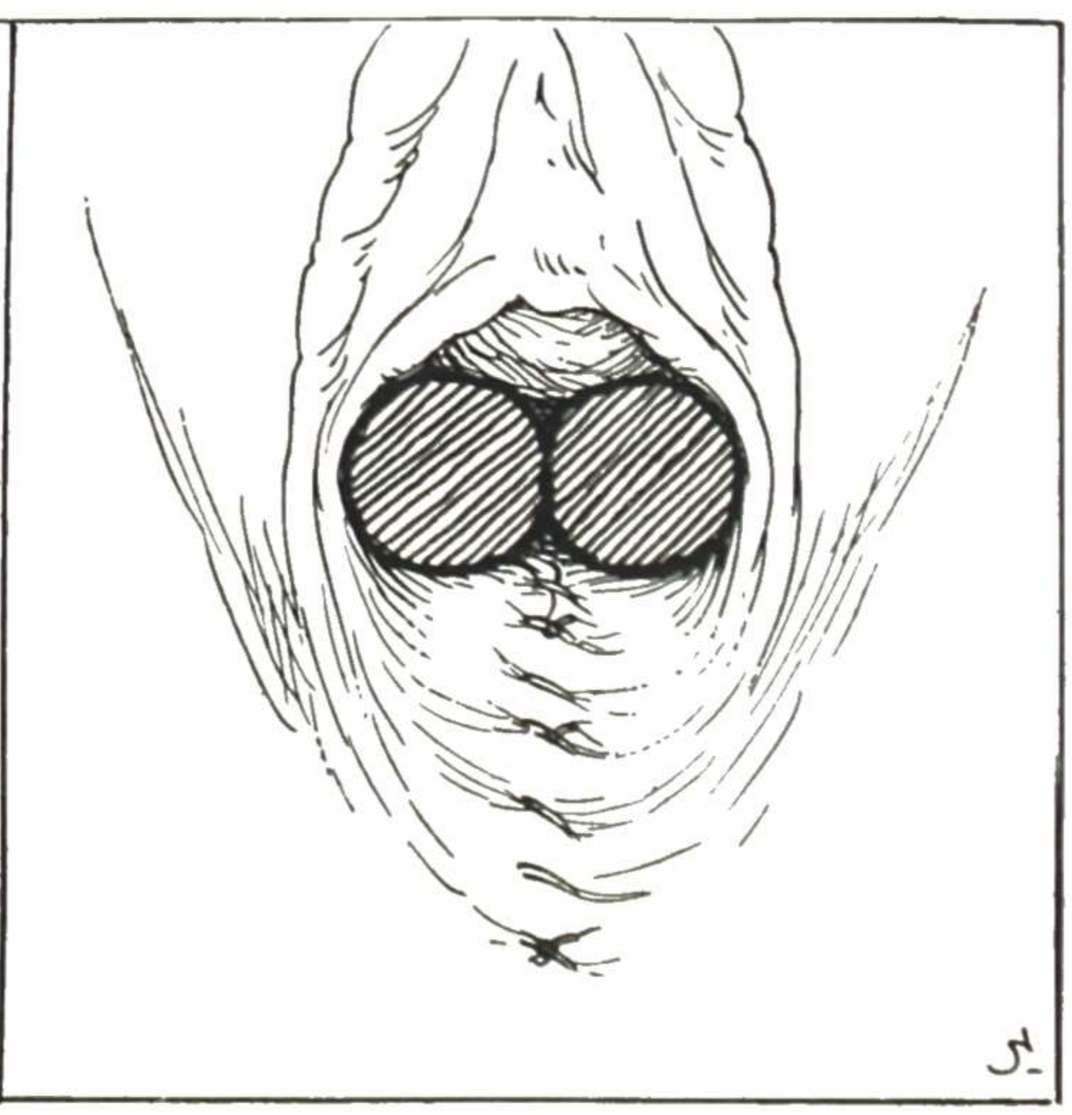


Fig. 503.

Fig. 502.—Testing the size of the opening immediately after tying the upper deep sling suture, to see whether the sling is repaired high enough. At this stage of the operation the opening should admit three fingers, as indicated.

Fig. 503.—Testing the size of the vaginal opening at the close of the operation, when it should admit two fingers easily. The supporting constriction should be well inside, as here indicated. Avoid constriction of the sensitive tissues at the mucocutaneous junction.

After the first approximating suture is tied and the result tested, the lower portions of the exposed sling surfaces are sutured together, as indicated in Figs. 504 and 505. The approximation may be made with a continuous suture or with interrupted sutures. The continuous suture saves time and reduces the number of buried knots. Having completed the sling suturing, the overlying connective tissue is approximated by the continuous suture going back (Fig. 505), to be tied finally at the first knot.

5. Closing the Opening in the Pelvic Floor.—The excess of vaginal wall is trimmed away, as shown in Fig. 506, and the vaginal wound is closed, as indicated in Fig. 507. In trimming away any excess of vaginal wall, be careful to leave some redundancy in order to avoid scar-tissue constriction which may be uncomfortable later. When the suture has been started in the upper angle of the vaginal wound, one bite should be taken into the deeper tissues in order to fasten down this redundant angle of vaginal wall. Unless this precaution is taken, this angle may later form a troublesome projection. The senior author recalls one case, operated on before the adoption of the fastening-down stitch, in which this projection was

so troublesome that it had to be excised later. Any bleeding tendency of the wound margins is easily controlled by half-locking the running suture, as shown in Fig. 507.

In suturing at the vaginal entrance make the opening wider there than at the supporting area inside, in order to avoid discomfort in coitus, as explained later.

For suture material 40-day catgut No. 1 is very satisfactory throughout, for both deep and superficial sutures. When using a continuous suture, it is well to lock it, as shown in Fig. 507, to control bleeding from the edges. Some may wish to use a subcuticular suture for the outside part of the wound.

Fig. 504.

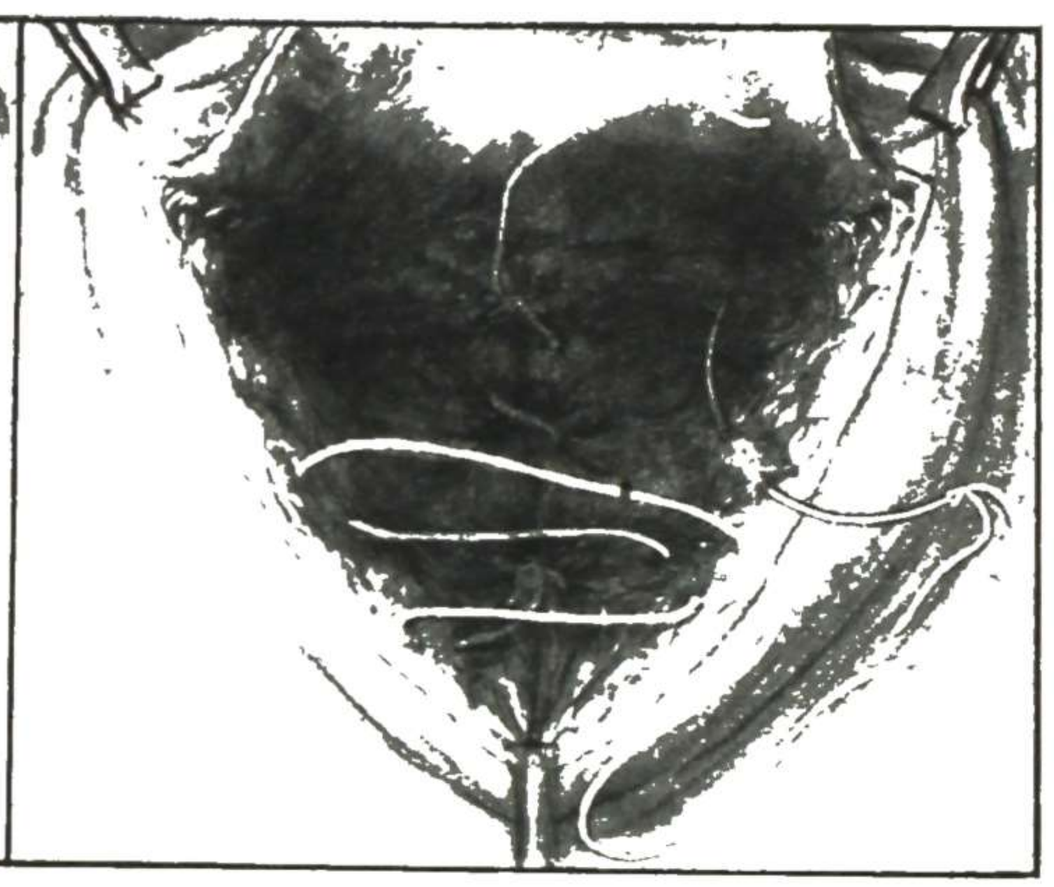


Fig. 505.

Fig. 504.—The first sling suture has been tied, the resulting support-constriction tested (Fig. 502) and found satisfactory, and lower portions of the sling are being approximated by a few turns of the continuous suture. Some upward pull on the first suture and a counter pull below with finger or tissue forceps, causes the deep tissues to stand out for easy suturing.

Fig. 505.—The more superficial tissues are being approximated by the same running suture, as it is carried back to be tied to its end.

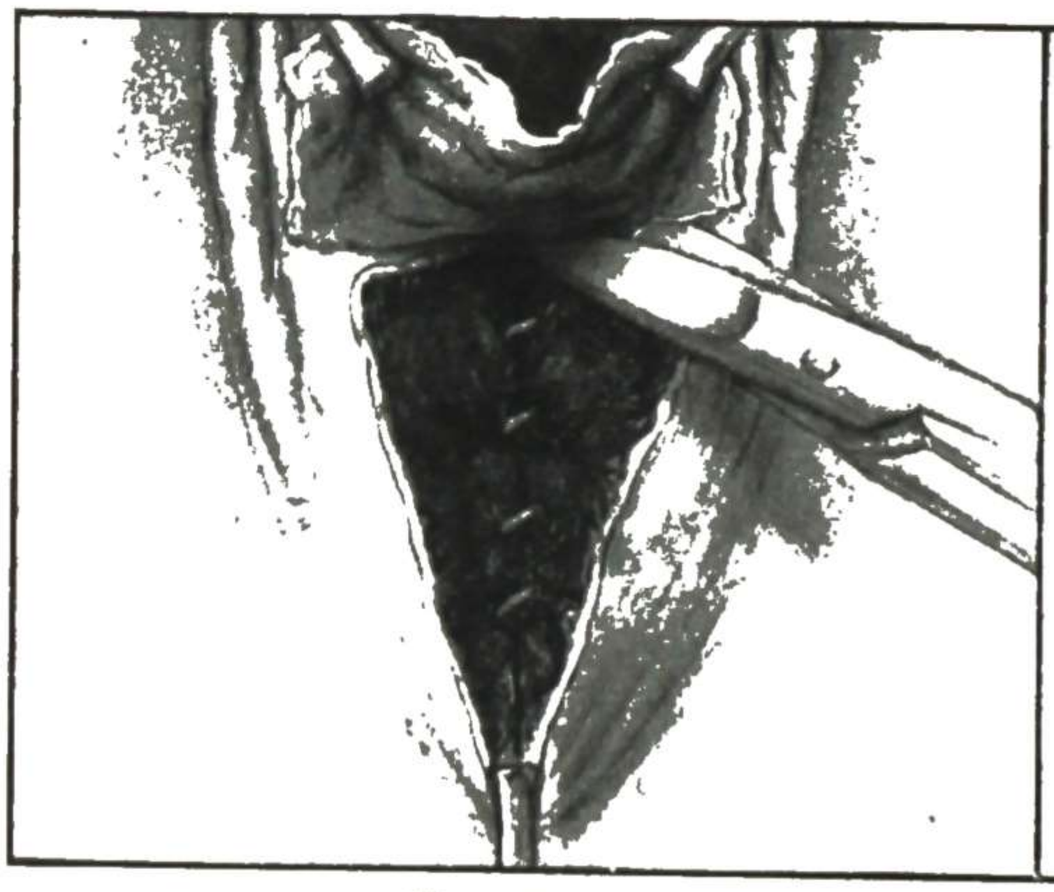


Fig. 506.

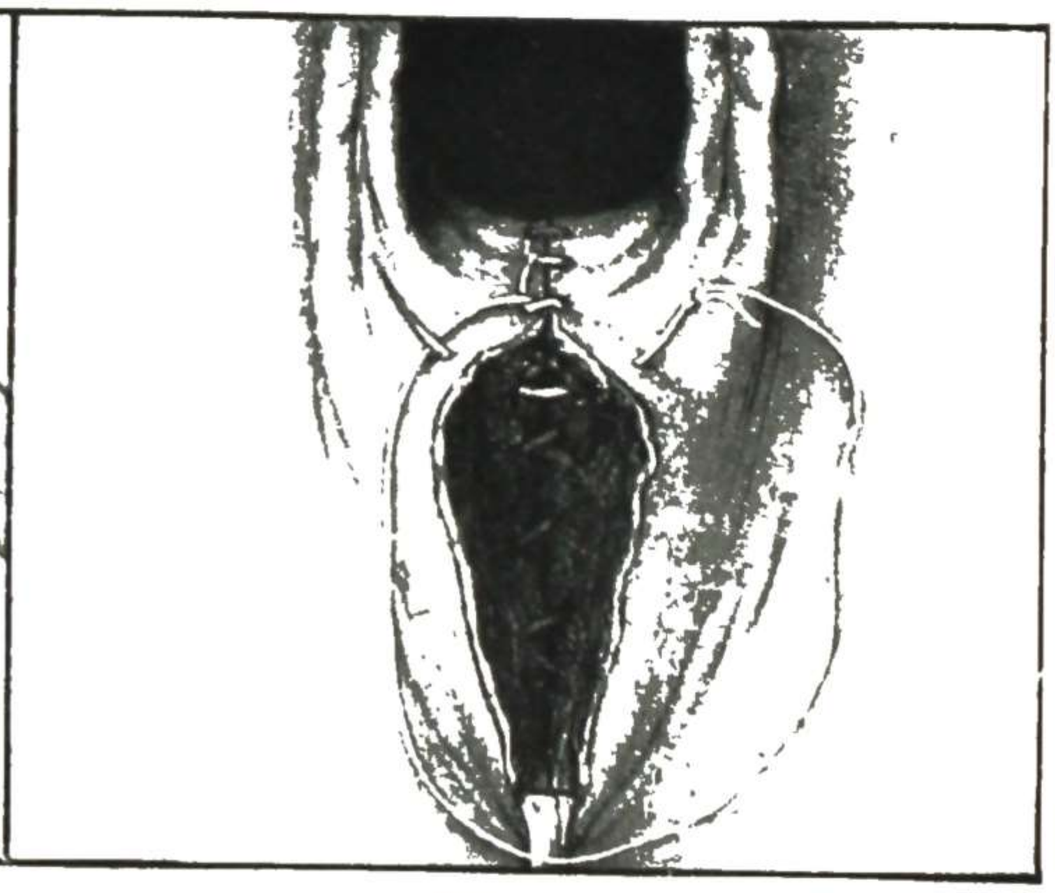


Fig. 507.

Fig. 506.—Trimming off the excess of vaginal wall where it is decidedly redundant. Some redundancy of the vaginal wall is beneficial in that it tends to prevent scar-tissue constriction which may be uncomfortable later. Consequently, any trimming should be done sparingly, leaving plenty of vaginal wall, so that there will be some loosenness after the suturing is completed.

Fig. 507.—Closing the wound. The half-locked suture checks bleeding from the wound margins. Avoid constriction at the vaginal opening that may cause discomfort later, as explained in the text.

6. Avoid Constriction at Vaginal Entrance.—Discomfort in coitus after pelvic floor repair is due usually to constriction at the vaginal entrance, rather than to the narrowing in the region of the supporting pelvic sling. Very exceptionally the discomfort is due to the development of a hypersensitive point in the repaired area of the sling, with or without undue

narrowing in that region. However, in most of the patients with this postoperative disturbance, the discomfort is due to narrowing of the vaginal entrance at the sensitive mucocutaneous junction. In his anxiety to give good support, the operator is inclined to extend the maximum narrowing out to the sensitive skin margin, which extension is not necessary for support and is very likely to lead to the discomfort mentioned.

This postoperative disturbance may be avoided by special attention to certain details. As already explained the essential supporting structures of the repaired floor are some distance inside the vaginal entrance. From this point outward the opening should be left somewhat wider, giving a funnel effect with the narrow part inside away from the sensitive

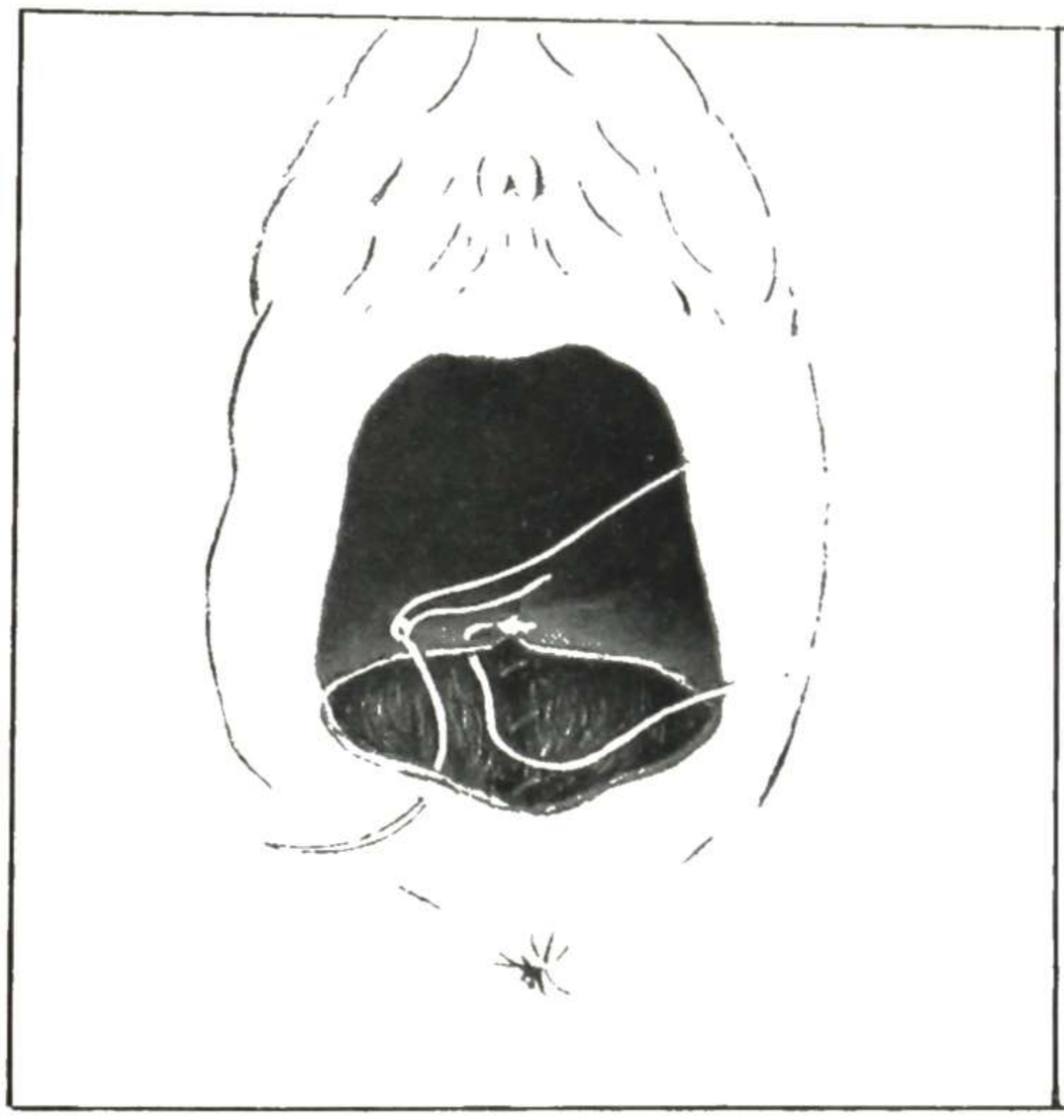


Fig. 508.

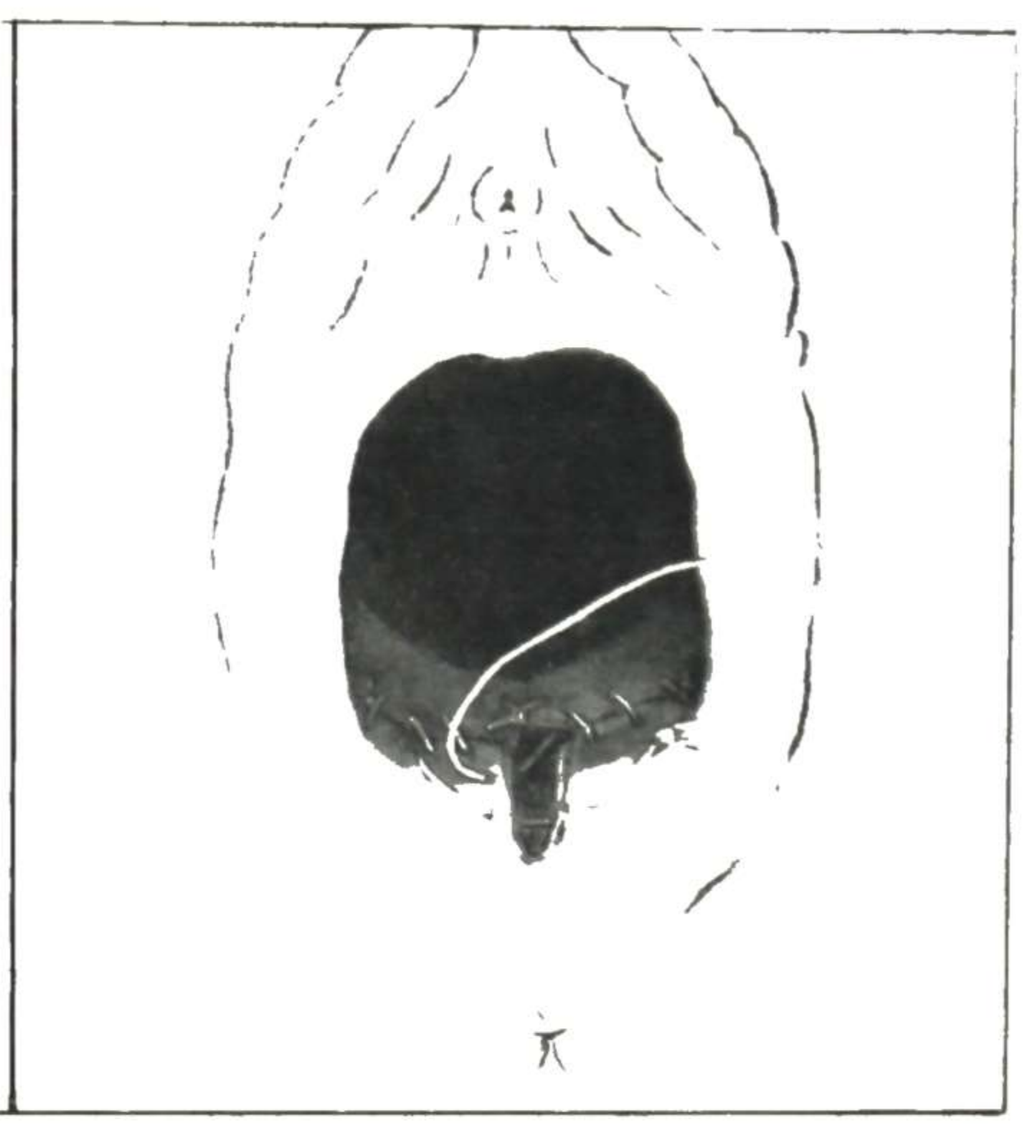


Fig. 509.

Fig. 508.—Closing each end of the wound horizontally in a case where this is necessary in order to avoid constriction at the vaginal entrance.

Fig. 509.—Closing the median portion of the wound vertically. As explained in the text, the relative amount of horizontal closure at each end (and the resulting amount remaining for vertical closure) is easily varied to meet the conditions in the individual case.

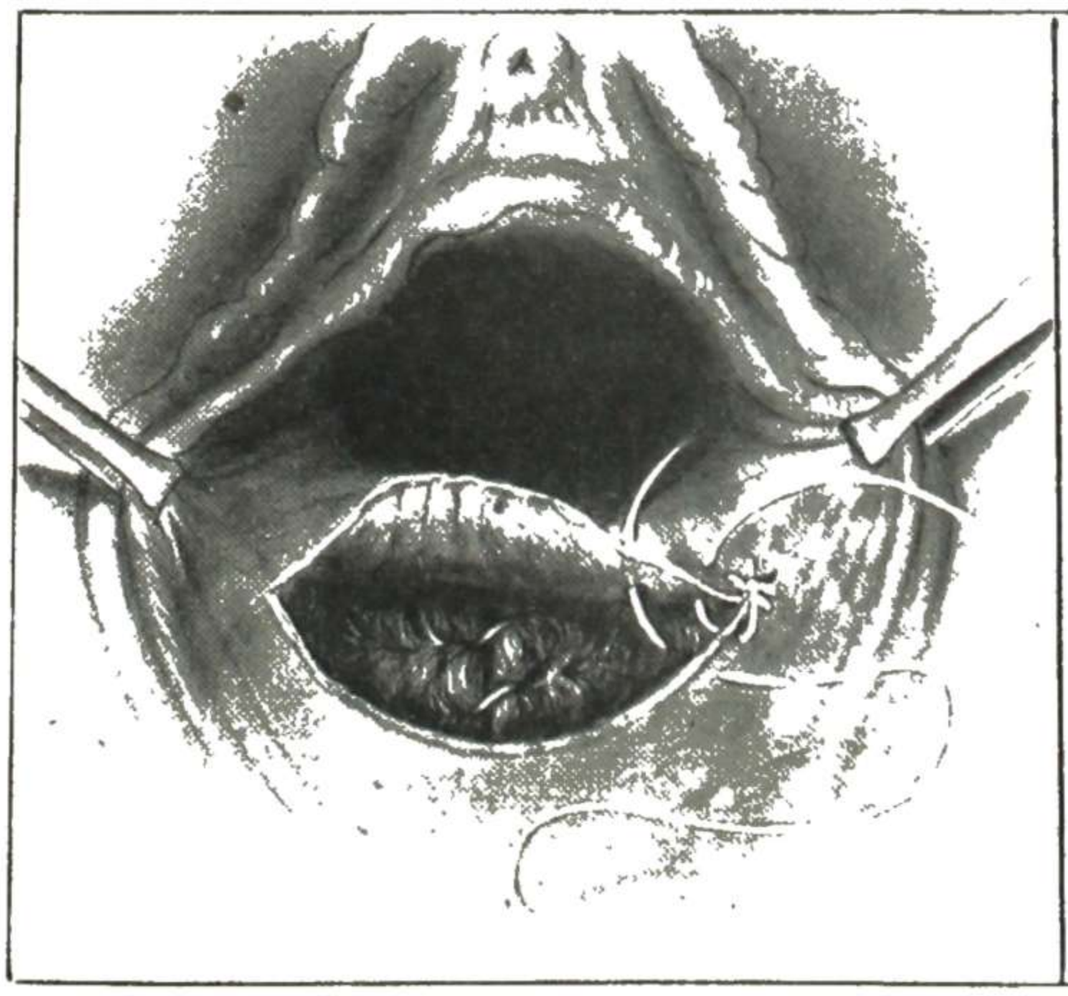


Fig. 510.

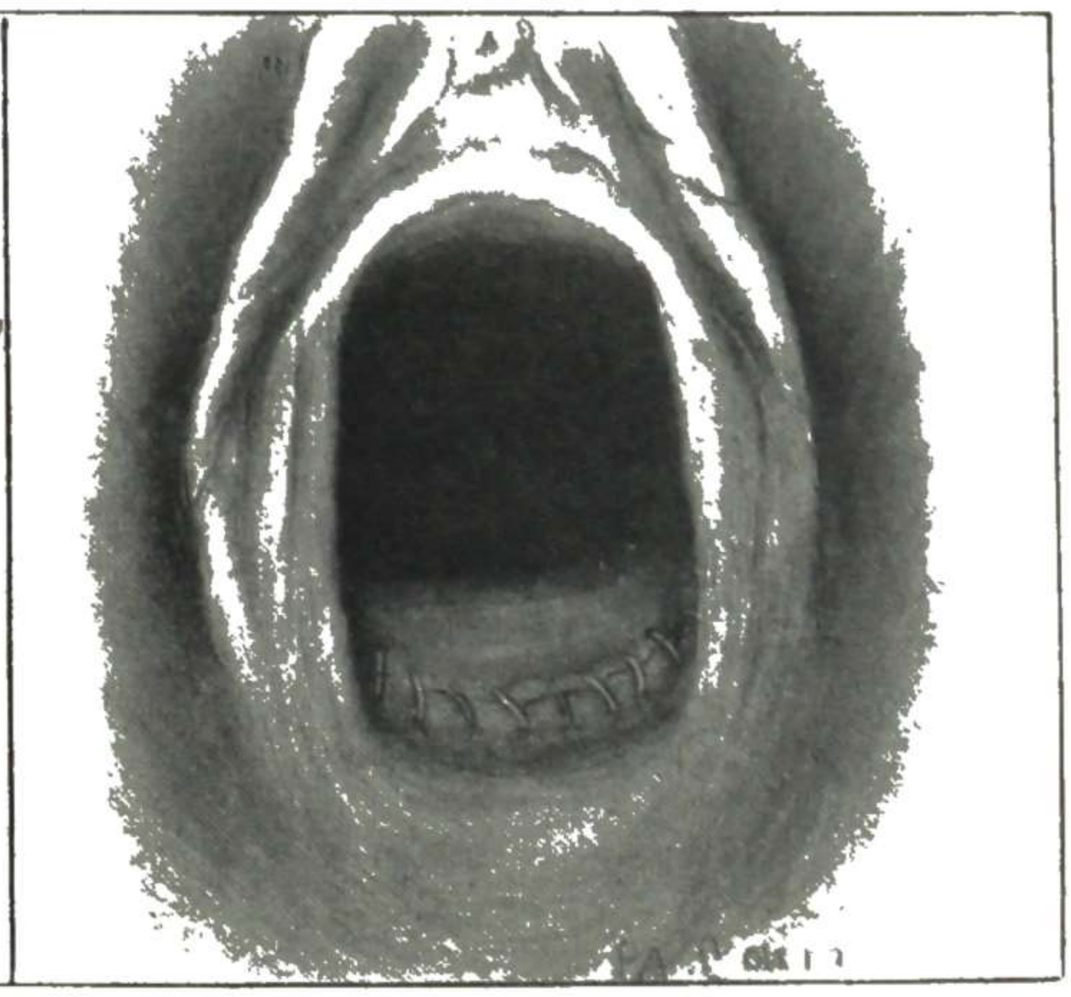


Fig. 511.

Fig. 510.—Closure of the wound after repair of moderate relaxation of pelvic floor without much redundancy of vaginal wall. There is no excision of vaginal wall. After the deep supporting tissues have been repaired as usual, the wound is simply closed horizontally, in the same direction in which it was made.

Fig. 511.—The horizontal closure completed. This preservation of a rather wide opening and redundancy of vaginal wall is especially important in nervous hypersensitive patients with a tendency to levator spasm.

skin margin. If this point be kept in mind in trimming away the excess of vaginal wall, the wound may be sutured in the usual way (Fig. 507). On the other hand, if too much of the vaginal wall has been trimmed away, it is then advisable to close as shown in Figs. 508 and 509, in order to avoid undue narrowing at the vaginal entrance. The horizontal closure at each end may be little or much, as needed to obviate constriction there. If slight, it is conveniently made by simply placing an interrupted suture at each end, and completing the vertical closure in the usual way. If a large horizontal closure is needed, continuous sutures may be used, as indicated in Figs. 508 and 509.

In certain exceptional cases it is advisable to avoid excision of any vaginal mucosa. After the supporting pelvic sling has been repaired, the raised vaginal flap is brought back into place and the wound is closed in the same direction in which it was made, as shown in Figs. 510 and 511. This maneuver is useful in hypersensitive persons with a tendency to levator spasm, especially when the pelvic floor relaxation is only moderate and without much redundancy of vaginal wall. It is indicated also in patients near the menopause without much vaginal wall redundancy. In patients in the menopause or after that period, there is a tendency after operation for the tissues about the opening to shrink gradually, rather than stretch as in earlier life, and this fact should be kept in mind in repairing the pelvic floor in patients of that age if subsequent coitus must be provided for.

RECTOCELE

A moderate rectocele (Fig. 512) is taken care of by the regular repair of the pelvic floor, which gives strong support over the whole area. A marked rectocele (Fig. 513), presents so much redundancy of the anterior rectal wall

Fig. 512.

Fig. 513.

Fig. 512.—Small rectocele. (Hirst—*Diseases of Women.*)
Fig. 513.—Large rectocele. (Hirst—*Diseases of Women.*)

that the pouch should be obliterated by infolding with some extra sutures. The vaginal flap is separated very high, in some cases two-thirds of the distance to the cervix uteri. Then, before the deep muscular sutures are passed, the

projecting pouch of rectal wall is obliterated by a row or two of fine chromic catgut suturing, as shown in Figs. 514 and 515. After that the regular pelvic floor repair is proceeded with, the next step being the suturing of the strong pelvic sling in front of the infolded rectal wall.

CYSTOCELE

Cystocele of the most severe type (Fig. 517) occurs in conjunction with prolapse of the uterus, and its correction constitutes one of the important features in operation for prolapse, with which subject it is considered. Cystocele of moderate degree not complicated by uterine prolapse or retrodisplacement does not require such extensive operation for correction, but it does require careful investigation to determine the exact type of lesion present in the particular case and an accurate operative procedure adapted exactly to the conditions found.

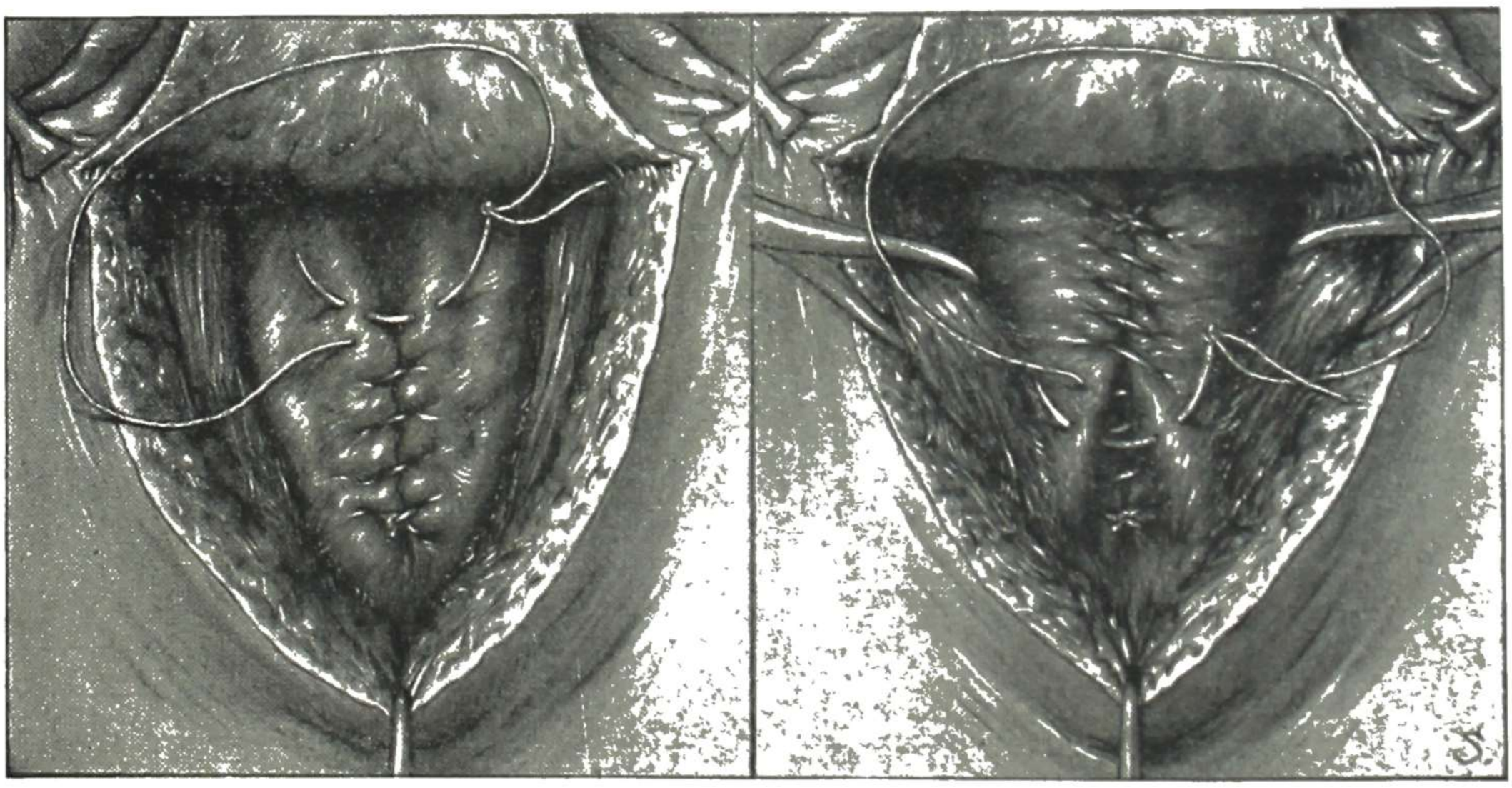


Fig. 514. Fig. 515.

Figs. 514 and 515.—Special sutures for rectocele. Fig. 514 shows method of placing the first row of sutures for turning in the redundant rectal wall. Fig. 515 shows the first row completed and the second row being passed.

The small or moderate cystocele (Fig. 516), which seems such a simple lesion and so easy to correct, is really a lesion of unusual interest. There are important hidden features which required a long time to work out, and which are still unappreciated by many operators. The troublesome symptoms of this type of cystocele are largely those of mild bladder irritation—frequency, urgency, recurring desire to urinate, and imperfect control. In many cases these symptoms persist after operative correction of the vaginal cystocele. It was this persistence of symptoms which led to the prolonged study that brought out the following facts:

1. There are two kinds of cystocele—the high one which occurs above the upper margin of the vesical trigone, and on vaginal examination is found immediately in front of the cervix uteri, and the low one which involves the vesical trigone and sphincter area and urethra and is found at the vaginal entrance. The first (posterior cystocele) is

a simple stretching of the bladder wall and adjacent supporting tissues, and is taken care of by the usual infolding operation with elevation of the bladder to its normal position on the uterus.

2. The anterior cystocele, involving the trigone and urethra, represents serious damage to the bladder control mechanism, and its cure requires study of this mechanism, determination of the exact damage in the particular case and adaptation of measures to restore normal functioning. The projecting pouch at the vaginal entrance may be obliterated by suturing and still the patient continue to have the annoying bladder symptoms, for the relief of which she went through the operation.

3. Study of these cases has shown that from the stretching and pressure of the tissues in labor, between the advancing head and the pubic arch, there has been damage to the trigone longitudinal muscle and sphincter and urethra, which structures must cooperate in the normal mechanism of bladder evacuation and urine control. The trigone muscle, which passes from the trigone forward through the internal sphincter and is attached along in the urethra, is an important factor in normal evacuation of the bladder, for contraction of

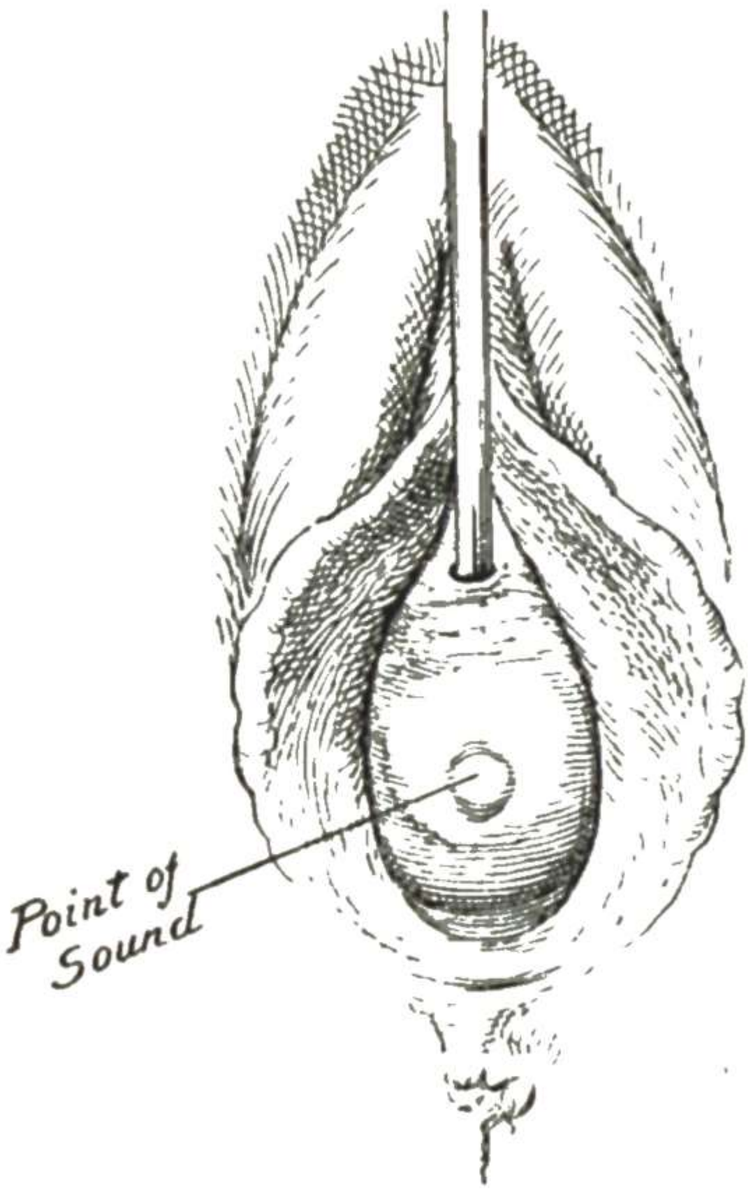


Fig. 516.

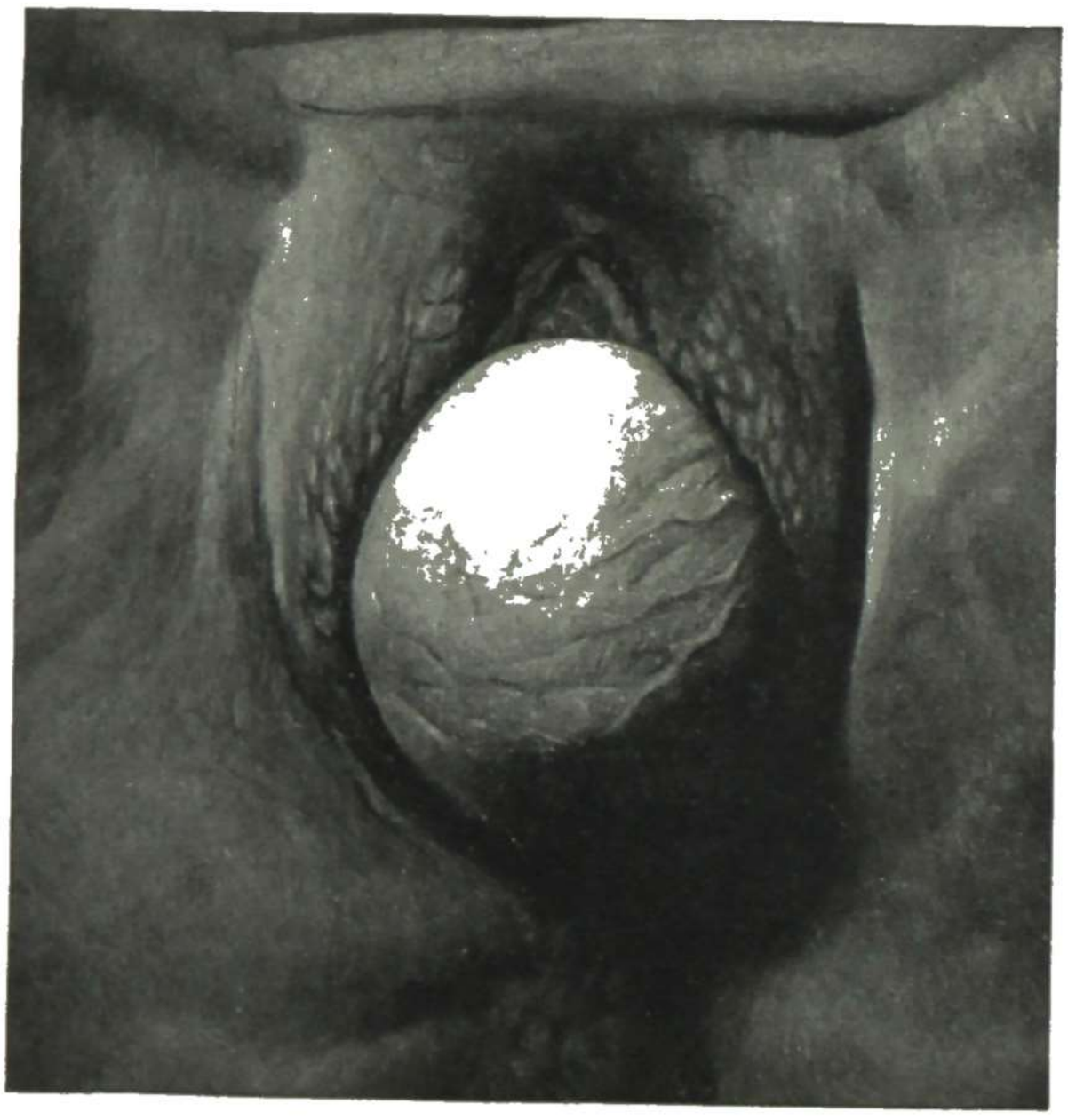


Fig. 517.

Fig. 516.—A small cystocele. (Ashton—*Practice of Gynecology.*)
Fig. 517.—A large cystocele. (Ashton—*Practice of Gynecology.*)

this longitudinal muscle opens the sphincter and at the same time depresses its lower margin so that all urine can escape. This muscle is torn across more or less in these cases so that the lower margin of the sphincter is not depressed, and residual urine remains. The irritation from the residual urine and other factors causes strong contraction of the sphincter, which draws it up farther and makes more pouching and more residual urine. Thus there is established a vicious circle which makes the lesion a progressive one. That is the reason why troublesome cystocele may not appear till some years after the childbirth which caused the primary damage, and also the reason why the partial immediate relief following simple obliteration of the vaginal pouching gives way later to return of the old bladder symptoms.

4. In addition to the damage to the trigone muscle and vesical area, the urethra also suffers a functional disorganization. The stretching, with pinching of the structures between the child's head and the pubic arch, damages the urethra and its fascial sheaths so that they sag and form a urethrocele. The meatus, being out of the line of direct compression, retains its high position. Thus, instead of a fairly straight urethra with strong walls, the patient has a curved, wide, sagging urethra. The dragging on the high fixed

narrow meatus tends to narrow it still further toward stricture. This urethral distortion also is progressive, and continues so after simple operation for obliteration of the vaginal pouch.

5. The cure of this condition necessitates, first, its recognition through competent cystoscopic investigation which determines the particular type and combination of lesions in that case and, second, the employment of special suturing which restores the functional continuity of the trigone muscle, obliterates the urethrocele and straightens the sagging and bowed urethra. The details of this operative work are described and illustrated in our operative volume.

6. Three other points of interest are: a. For permanent relief, it is important to repair also the pelvic floor and any rectocele, so as to back up the repaired anterior plane by good support in the posterior plane. b. Cystoscopic investigation of the trigone muscle area and also of the urethra is advisable in all cystocele cases before operation, that the exact conditions may be determined and the operation planned accordingly. c. Trigone muscle injury may be present without any evident vaginal cystocele, and hence there should be cystoscopic examination for this lesion in any case of persistent bladder discomfort even though there is no outside evidence of childbirth damage.

7. This troublesome lesion, which is progressive and hence gives increasing disturbance through the years, may be prevented by well-timed episiotomy, which permits delivery of the head and shoulders without the serious overstretching of the tissues at the base and neck of the bladder and along the urethra.

Partial Incontinence of Urine

Some patients complain of inability to control the urine when coughing, laughing, sneezing, etc. Others state they must empty the bladder promptly or there will be leakage. In case of inability to control the urine, resulting in some escape at times, the first thing is to determine whether the escape is due largely to irritation, causing premature expulsive contraction, or altogether to weakness of the vesical sphincter control.

In the cases due largely to mild cystitis or other irritation, the leakage is preceded by a desire to urinate which must be responded to promptly or leakage will follow. In such a case, cystoscopic investigation and treatment will often restore control by eliminating the mild cystitis or pyelitis.

Endocrines, male as well as female, have been found to influence bladder and ureteral function. Schultz and Anderson report 50 cases of enuresis in children treated with male hormone, with 54 per cent cured.

LACERATION OF SPHINCTER ANI MUSCLE

If the laceration of the pelvic outlet has extended through the sphincter ani muscle (Fig. 518), there will be incontinence of feces and intestinal gases, making the patient miserable and excluding her from society. When completely torn, the sphincter ani retracts—sometimes to such an extent that it scarcely reaches halfway around the rectal opening. It may be felt as a thick cord at the posterior part of opening. A slight dimple, or retraction of tissue, frequently marks the location of each end (Figs. 519 to 521). A small area of the rectal mucous membrane may be visible as a red inflamed-looking spot, marking the situation of the anus (Figs. 520, 521).

If the sphincter muscle is not completely torn, a few fibers remaining intact, the patient may be able, even from the first, to retain solid feces—that

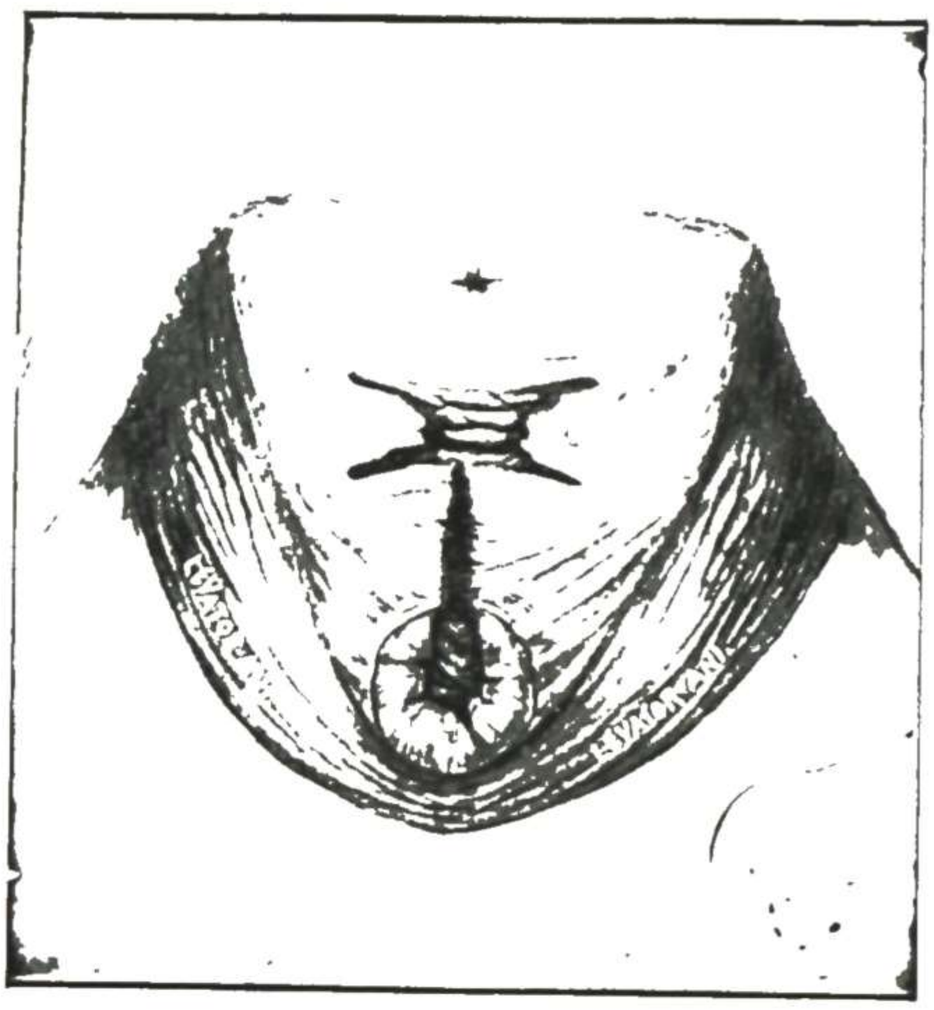


Fig. 518.

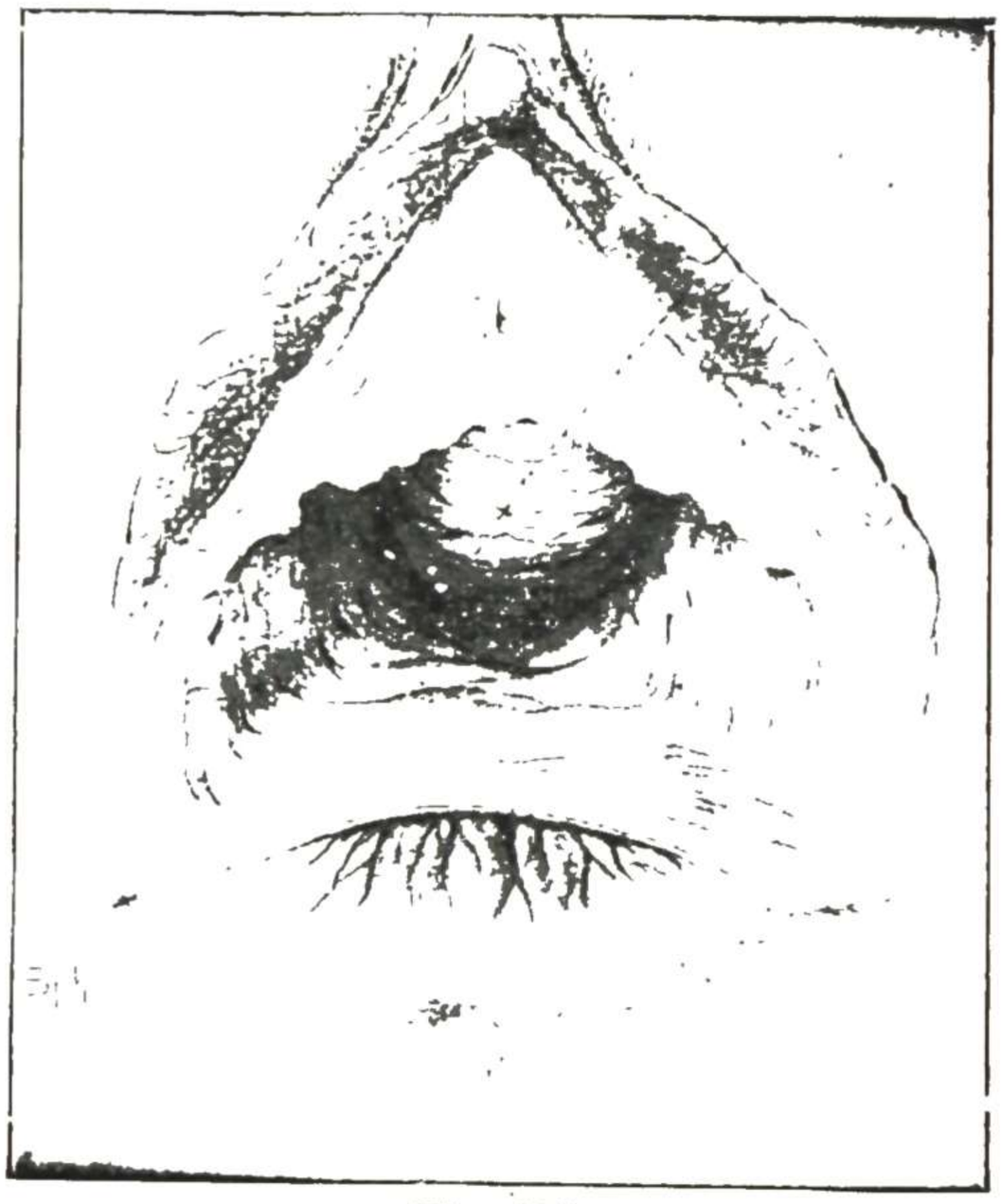


Fig. 519.

Fig. 518.—A laceration extending directly through the sphincter ani muscle and other structures between the vagina and rectum. The levator ani muscles are not involved. (Gilliam—*Practical Gynecology.*)

Fig. 519.—Representation of the conditions present in an old laceration through the sphincter ani. Notice the wide separation of the sphincter ends and also the exposed rectal mucosa. Each end of the torn sphincter ani muscle is indicated by a slight dimple in the skin. (Kelly—*Operative Gynecology.*)

Fig. 520.

Fig. 521.

Fig. 520.—Complete laceration of the perineum. The sphincter ani muscle has been torn and the ends are separated. The small dark area is an exposed portion of the red mucosa of the rectum. (Hirst—*Diseases of Women.*)

Fig. 521.—Another case of laceration through the perineum into the rectum. Notice the separation of the sphincter ends and also the patch of rectal mucosa. (Hirst—*Diseases of Women.*)

is, there is only partial incontinence. In these cases of partial rupture of the sphincter, and also in cases of complete rupture in which the muscle was paralyzed by the stretching before rupture and the ends of the muscles or tissues close to the muscle lay in contact and became partially united, the patient has control of the bowels except when diarrhea is present. In some cases the patient has control over feces, both solid and liquid, but there is incontinence of gases.

Fig. 522.—Laceration through the sphincter ani muscle. In the course of months and years the torn muscle tends to straighten out, causing the torn ends to become widely separated, as here shown. Also, the upper angle or point of the rectal tear is gradually drawn downward.

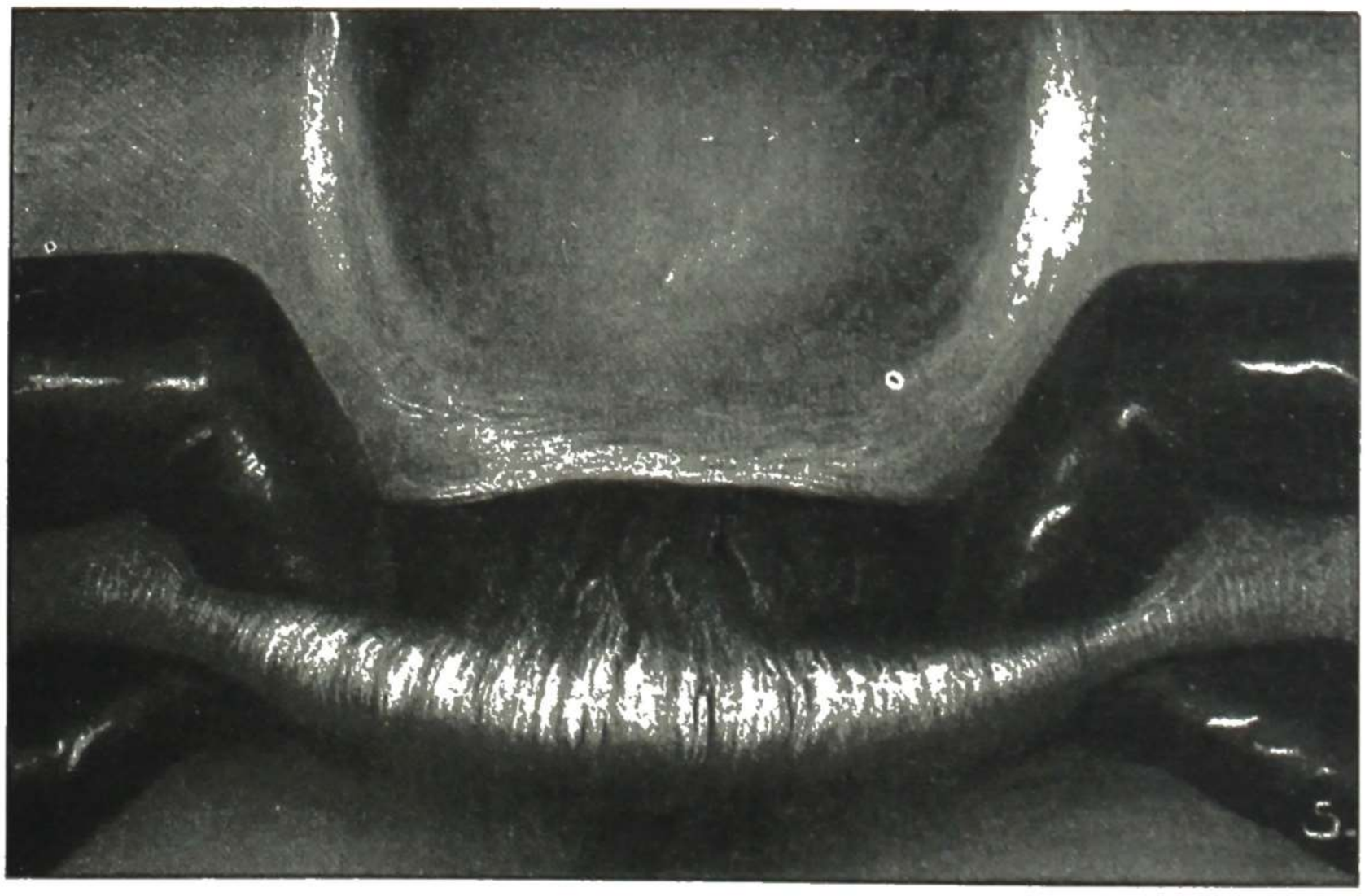


Fig. 523.—Stretching the atrophic and contracted sphincter ani muscle, preparatory to repair.

A laceration through the sphincter ani muscle and rectovaginal septum does not necessarily mean that there has been great damage to the pelvic sling. The principal part of the sling passes back of the rectum, not between it and the vagina.

If the rectal tear is accompanied by deep lacerations at the sides of the vagina, involving the levator ani muscles, then there will be marked loss of support in the pelvic floor and consequent relaxation of the vaginal outlet. Such accompanying deep lateral lacerations do frequently occur with the result mentioned. But in some cases, the tear in the median line into the rectum seems to have been the only serious damage. In such a case, the incontinence of feces is the only troublesome symptom, there being no evidence of want of support for the pelvic organs.

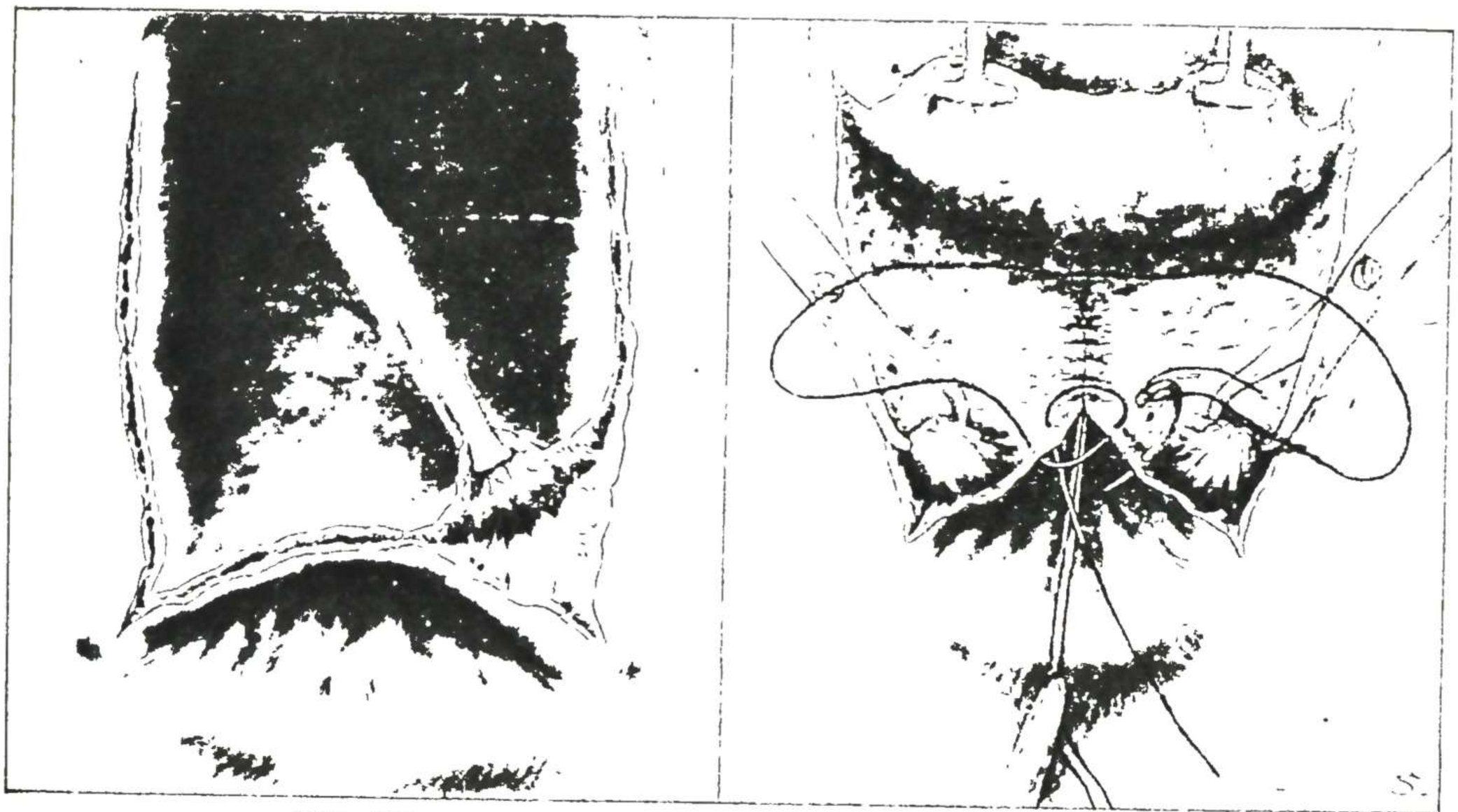


Fig. 524. Fig. 525.

Figs. 524 and 525.—Rectal suture method of repairing complete laceration. Fig. 524 shows line of incision. Fig. 525 shows method of suturing rectal wall.

Fig. 526. Fig. 527.

Figs. 526 and 527.—Rectal suture method of repairing complete laceration. Fig. 525 shows rectal suture completed, and sphincter ends isolated ready for suturing. Fig. 527 shows sphincter ends sutured, and the reenforcing silkworm-gut sutures passed.

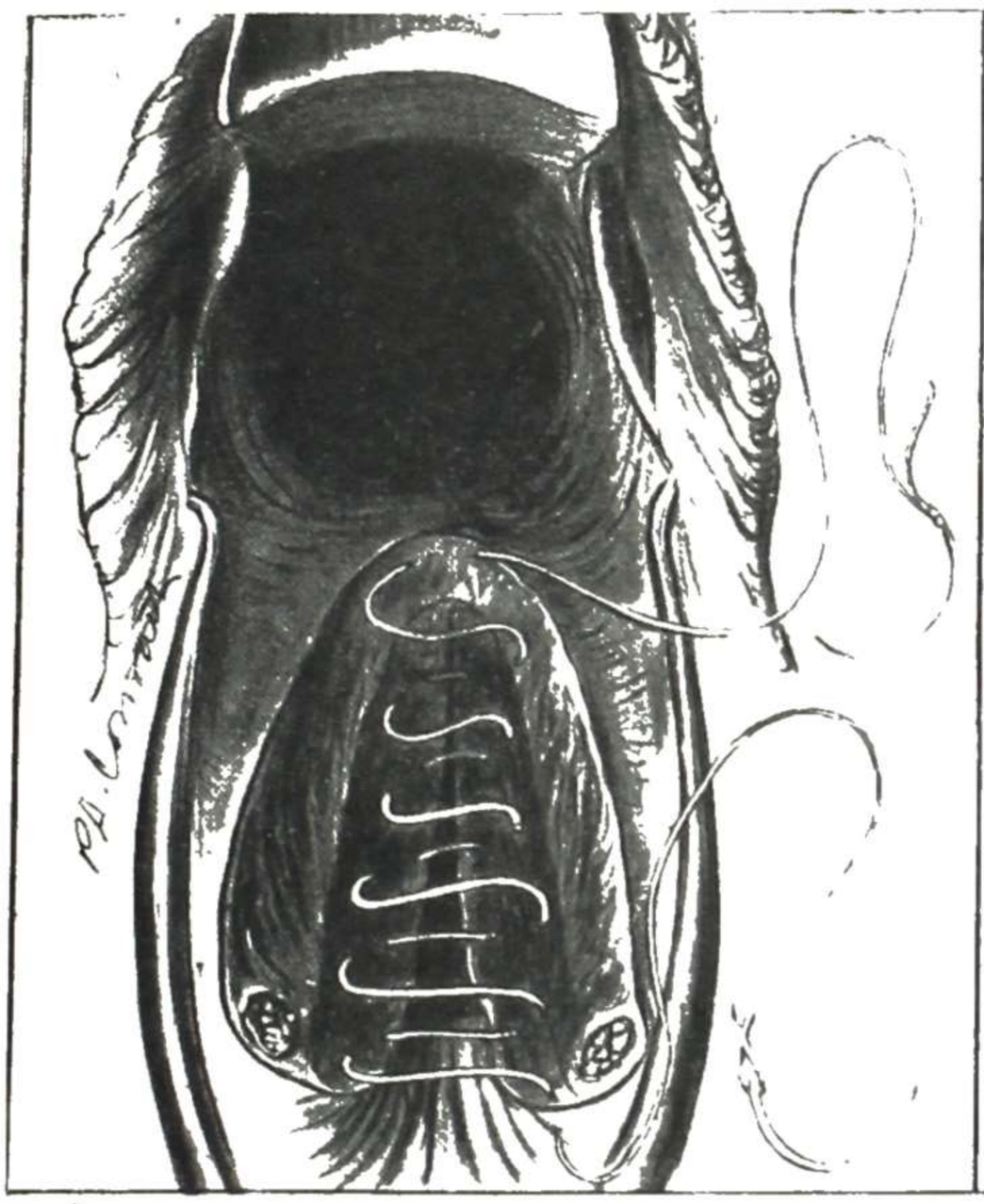


Fig. 528.

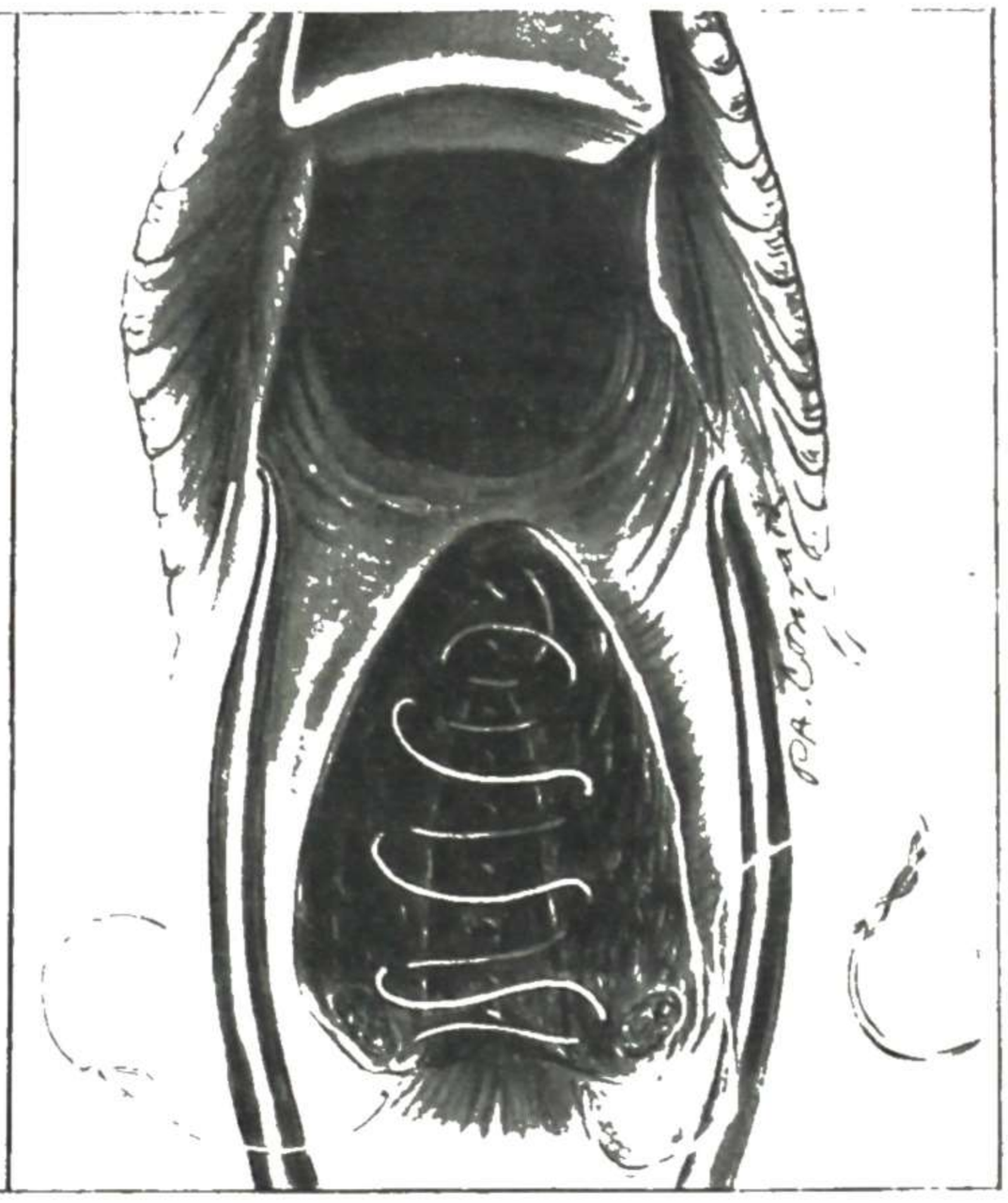


Fig. 529.

Fig. 528.—Closure of rectal wall by a continuous suture, with a small curved needle on each end. The suture begins in the muscle *above* the apex of the tear and ends in the anal skin superficial to the sphincter ani.

Fig. 529.—The other end of the suture approximates the perirectal tissues over the first line of suture. Using a continuous suture the rectal wound is thus closed in two layers. No suture penetrates the rectal wall, and there are no knots buried or anywhere in contact with the rectum, the two ends of this suture being tied outside and constituting the lowermost perineal suture outside the skin. (Royston—*Am. J. Obst. and Gynec.*)

Fig. 530.

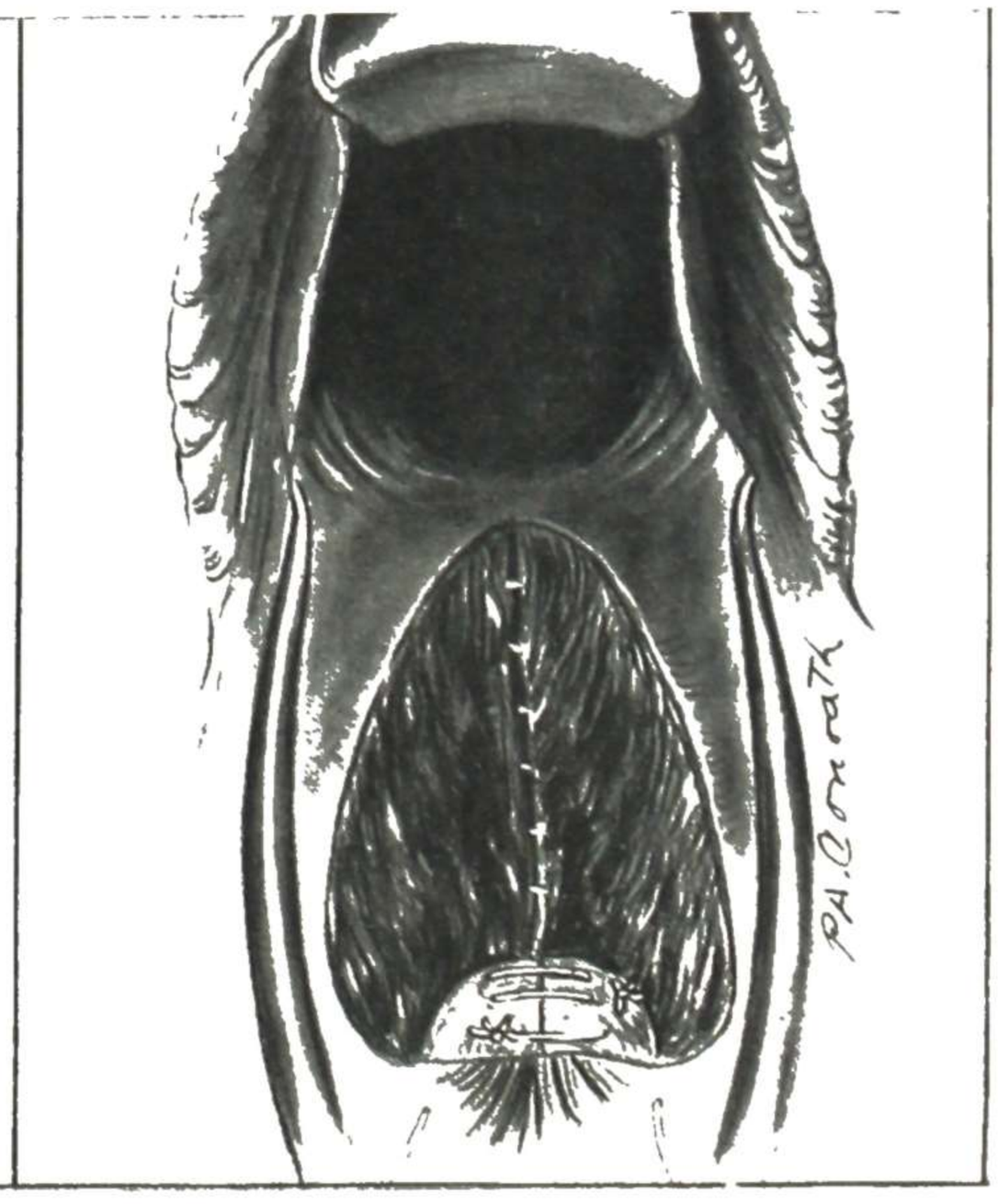


Fig. 531.

Fig. 530.—The rectal wound has been closed in two layers with ends shown not yet tied. The sphincter ani is now united by a deep suture through the inner third.

Fig. 531.—Two sutures, preferably mattress or simple interrupted sutures, are carried through the outer third of the sphincter ani and now approximate the margins of the latter. The knots are placed on opposite sides away from the line of union. Note the free ends of the sutures used to close the rectal wound. (Royston—*Am. J. Obst. and Gynec.*)

This essential difference between median and lateral lacerations explains why it is that some cases of complete perineal laceration with incontinence are not accompanied with the prolapse of the uterus and vaginal walls, so frequently seen in incomplete perineal lacerations. On the old theory that the perineum (perineal body) was the important supporting structure at the pelvic outlet, this class of cases was inexplicable. Since the facts in regard to the anatomy and function of the component parts of the pelvic floor have become known, these cases are easily explained.

Steps in Repair of Lacerated Sphincter Ani

When the tear has extended into the rectum (laceration through the sphincter, "third degree tear"), a more thorough preoperative preparation of the intestinal tract is required, for it is advisable that there be no bowel

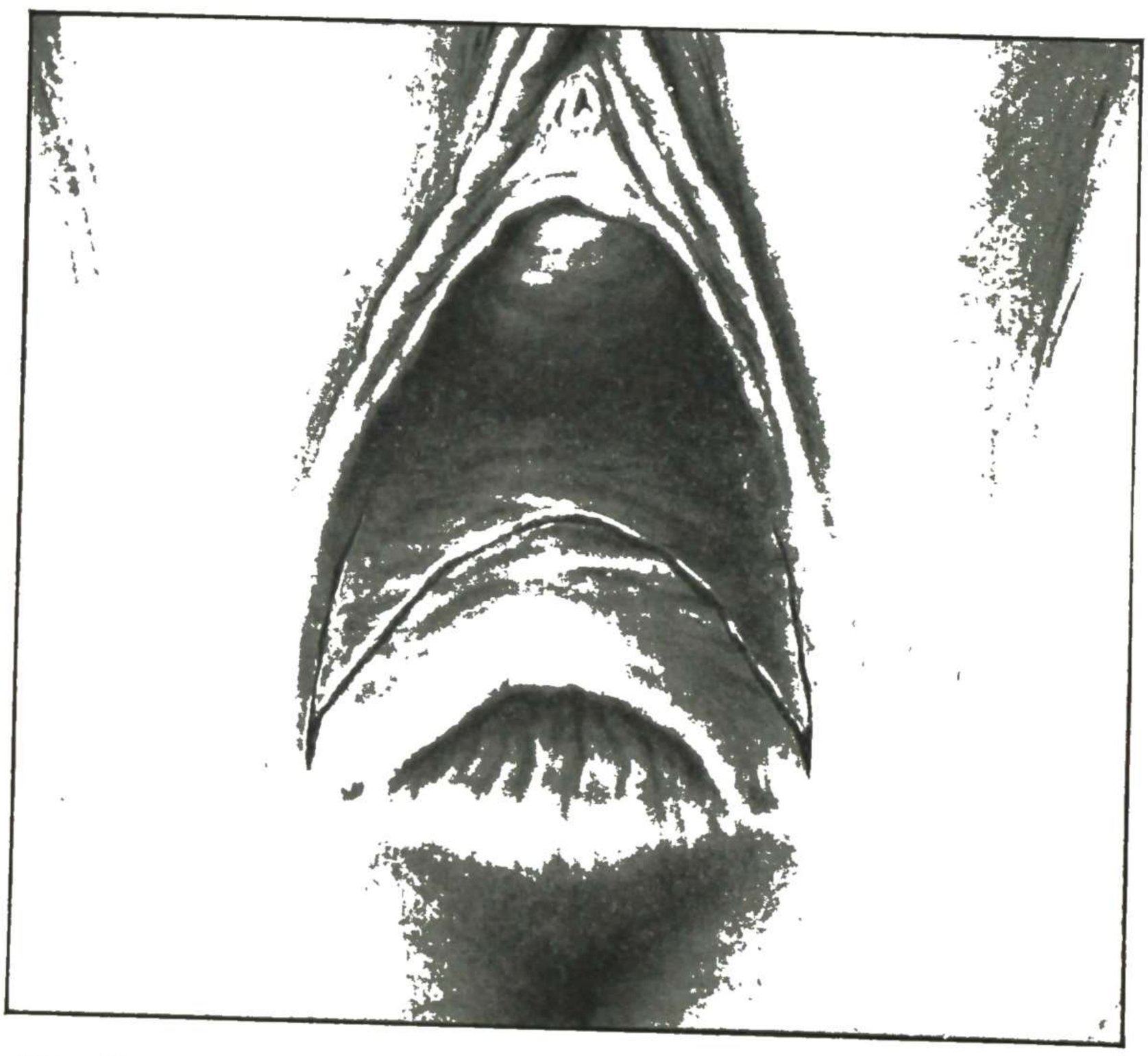


Fig. 582.—Flap operation for torn sphincter ani. The incision for opening the pelvic floor. The angle of the incision on each side should be kept well above the depression marking the end of the esphincter.

movement for a week to ten days after operation. The patient should be on restricted diet, principally liquids, for two or three days before operation. She is to be given a moderate dose of castor oil one or two days before, an enema the evening before, and colonic flushing the morning of the operation.

Repair of the torn and incontinent sphincter muscle and rectal wall injury is a difficult operation requiring familiarity with surgical work in this region and particular care. Even then there is failure at times, and every attempt increases the difficulties of the next attempt. The details of the operation for this condition are given in the operative volume, but the principles of the correction are shown in the accompanying illustrations.

The first step, common to all three types of operative correction, is stretching of the contracted sphincter muscle, as shown in Figs. 522 and 523, to lengthen it so that it can encircle the rectal exit.

The regular open method of repair with suturing through rectal mucosa is shown in Figs. 524 to 527. The pelvic sling suturing and other steps of pelvic floor suturing are completed after this special work.

The open method of repair with submucosal suturing is shown in Figs. 528 to 531.

The flap method of repair is shown in Figs. 532 to 534. After the suturing of the sphincter muscle and the pelvic floor repair, the flap is brought up and sutured in place. This plan eliminates the rectal mucosal wound and leakage through it. Particular care, however, must be exercised to avoid sloughing of the flap, and consequent opening of the wound to rectal contents.

Miller and Brown report a series of cases in which incision of the repaired sphincter muscle was employed to prevent spasm and tension which might interfere with healing. Their technique is shown in Fig. 535.

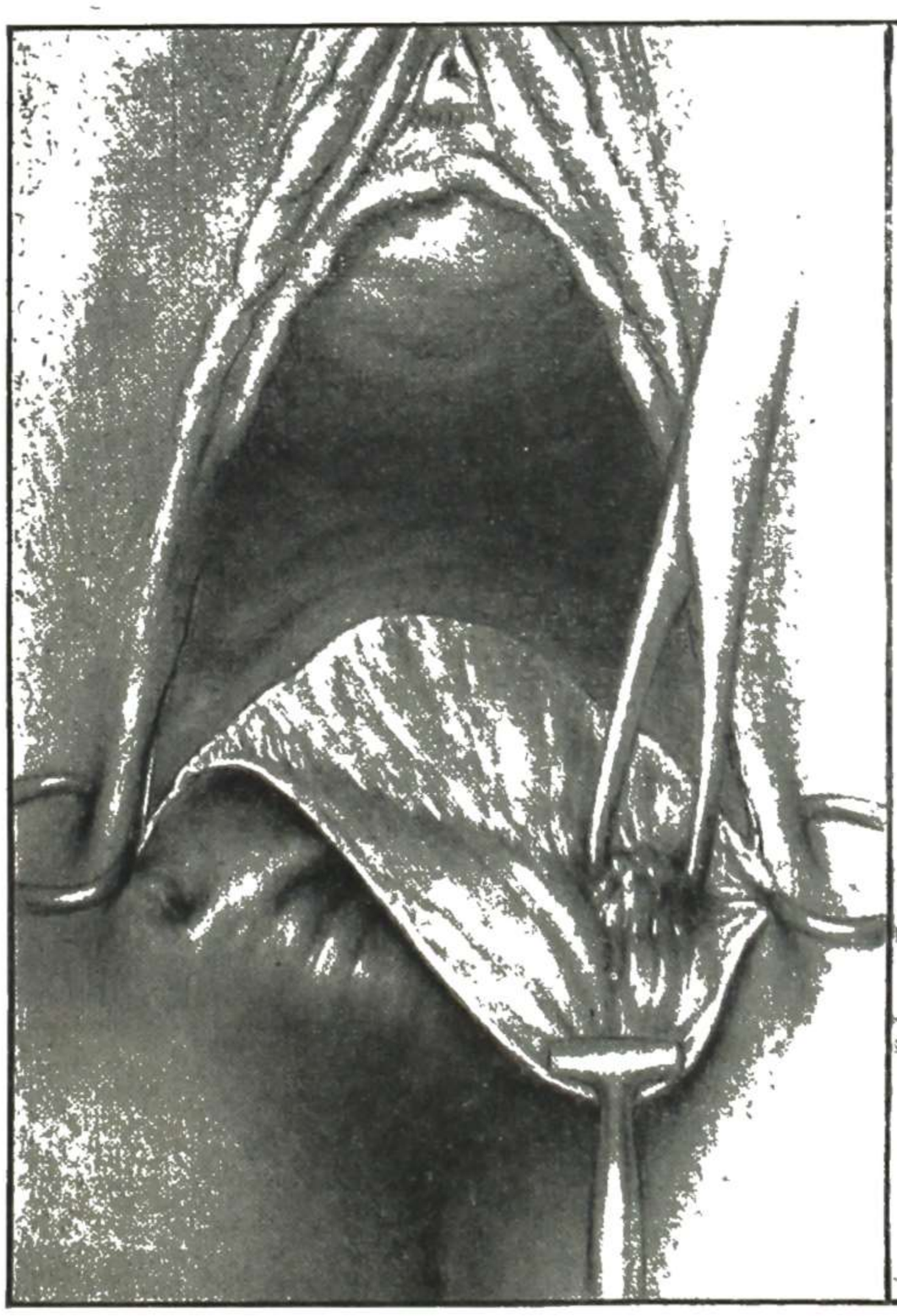


Fig. 533.

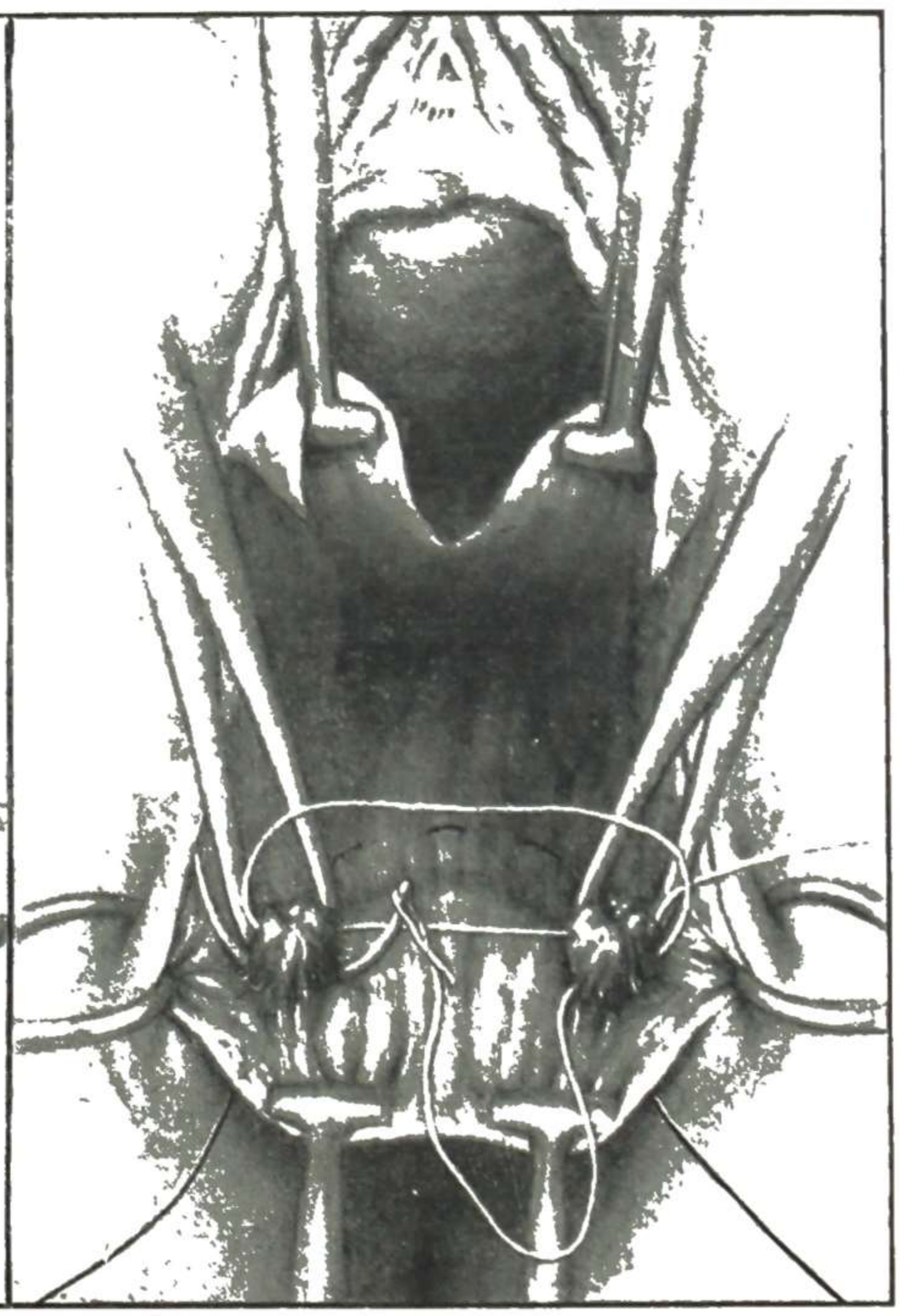


Fig. 534.

Fig. 533.—Turning down the flap. Care should be taken to avoid separating the flap too near to the rectovaginal scar, as that might interfere with its blood supply and cause sloughing. Button-holing of the flap also is to be avoided—a difficult task at times. If the flap is button-holed in a location to interfere with its integrity, it is preferably excised and the regular repair previously described carried out.

Fig. 534.—Identifying and suturing the sphincter ends. The course of the silkworm-gut suture is also shown.

Postoperative Care

The details of the usual care after vaginal operation are given in Chapter XIX. The items of special care after repair of laceration into the rectum, relate to protection of the healing area in the rectum from irritating material there and from strain or stretching that may tear apart the newly healed sphincter

muscle. Both of these objects are best attained by keeping the rectum empty for ten days to two weeks. This means no bowel movement during that time, and requires special diet and codeine or other sedative to avoid peristalsis.

Protection of the outside wound is probably best secured in many cases by leaving it alone, free from irritation by douching, sponging, dressing, etc. If there is already an irritating vaginal discharge, pitcher douching without handling and perhaps vaginal douching also may be advisable, if they make the patient more comfortable. There is a good deal to be said pro and con in regard to douches and dressings in postoperative care; and as the matter

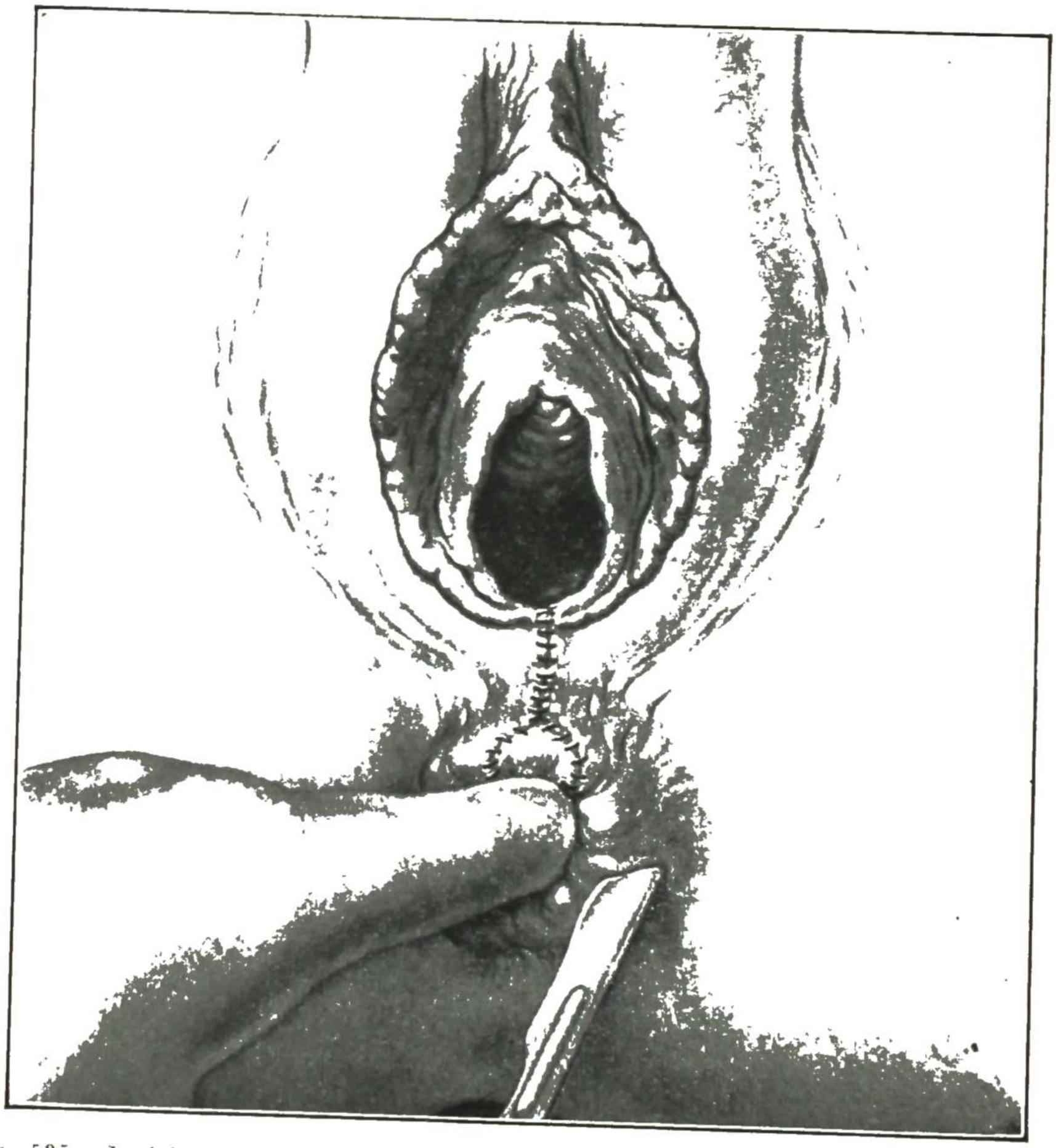


Fig. 535.—Incision of the sphincter muscle at the end of the operation. This may be done earlier if the muscle-ends cannot be brought together readily. Called "paradoxical" operation for repair of the sphincter. (Miller and Brown—*Am. J. Obst. & Gynec.*)

is still in the balance and cases differ so much, the comfort of the patient may usually be taken as the guiding factor. In general, the less any clean wound is disturbed by handling and dressing, the better it heals. On the other hand, an irritating vaginal discharge remaining and decomposing on a wound is more likely to cause discomfort and infection than if removed at suitable intervals by a nonirritating douche.

When the time comes for bowel movement, a soft stool is to be secured without straining and if possible without disturbing the healed rectum by enema or rectal tube. In case an enema should be found necessary to supplement the laxative, an enema of an ounce of oil should be carefully injected

through a small catheter and allowed to remain until a bowel movement is accomplished without straining. This may be supplemented later, if necessary, by a small enema of water, not more than four ounces, and given slowly to avoid distention.

RECTOVAGINAL FISTULA

From injuries in labor or from destructive ulceration or from other causes, fistulous openings may form, extending in various directions. The different varieties of genital fistulae, with the name given to each, are shown in Fig. 536.

A Rectovaginal Fistula is an opening from the rectum into the vagina. The size of the fistula may vary from a small tortuous tract, admitting only a small probe and permitting only gas or fluid to escape, to a large opening, involving a large part of the rectovaginal septum, through which pass practically all the rectal contents.

Fig. 536.—Fistulae of the genital tract. *1.* Urethrovaginal fistula. *2.* Vesicovaginal fistula. *3.* Rectovaginal fistula. *4.* Vesicouterine fistula. *5.* Ureterovaginal fistula. *6.* Intestinovaginal fistula. (Gilliam—*Practical Gynecology.*)

Etiology and Pathology

The following are the causes of rectovaginal fistulae:

1. *Injuries in Labor.*—In rare cases a hole may be torn through the rectovaginal septum, resulting directly in a fistula. Usually, however, a fistula resulting from labor is due to a complete laceration of the perineum, which is repaired at once or later, but fails to heal entirely. The lower part of the approximated surfaces unites, but a small part of the upper angle fails to heal, and the result is a fistula extending from the rectum into the vagina.

2. *Chronic Ulceration* of the posterior vaginal wall, which may be chancroidal or syphilitic or tuberculous. It usually affects the lower part of the vagina.

3. *Stricture of the Rectum,* with dilatation and ulceration of the rectal wall above it.

4. *Malignant Disease* of the rectovaginal septum is usually secondary to cancer of the cervix uteri or cancer of the rectum.

5. *Operation.*—A pelvic abscess which has ruptured into the rectum will, if opened into from the vagina, give a rectovaginal fistula. Again, in stricture of the rectum, there may be dilatation and ulceration of the rectal wall above the stricture with perirectal inflammation and an abscess. Such an abscess, if opened into from the vagina, will give a rectovaginal fistula. Again, the rectal wall may be injured directly in various operations.

Diagnosis

The diagnostic symptoms of rectovaginal fistula are the escape of some of the rectal contents into the vagina, and the vaginal irritation caused thereby. The amount and character of thè leakage from the rectum vary much in different cases. In the smallest fistulae only gas, with occasionally some liquid, passes. With the opening a little larger, there may be free leakage only when the bowels are loose and the contents fluid. In still other cases, nearly all the rectal contents, whether fluid or solid, pass through the fistulous opening.

Digital examination reveals a rough place in the posterior vaginal wall. On inspection, if the opening should be large, it may be seen; but if small, only a rough place with a small slit is visible. Very often a red papule marks the vaginal opening of the fistula. Exploration of the opening with a probe, with a finger of the other hand in the rectum, shows that the sinus communicates with the rectum. In a doubtful case in which the opening cannot be found or in which a probe cannot be introduced, the fact that there is a rectovaginal fistula may be established and its location determined by injecting colored water (methylene blue, ⅕ per cent solution) into the rectum and watching for its appearance on the posterior vaginal wall. If there is syphilitic or chancroidal or tuberculous ulceration, or if there is a stricture of the rectum or malignant disease, the evidences of the complicating disease will be present, in addition to the evidences of fistula.

Treatment

In the rectovaginal fistula following labor, that is, where part of the repaired rectovaginal septum failed to heal, no secondary operation should be undertaken for the closure of the fistula for six or eight weeks after labor. The fistula may close spontaneously within a few weeks. Again, an operation in the genital tract during the puerperium increases the chances of puerperal sepsis and later, when she has recovered from the debilitating effects of parturition, the patient will be in much better condition generally for the operation. Locally, also, the tissues have returned to their normal condition, and complete primary union is much more certain to follow the operation. For some time following labor the uterine discharge would tend to interfere with healing, and the tissues are so friable that the sutures are much more liable to cut through.

Palliative Treatment.—In the meantime, the vagina must be kept clean by antiseptic vaginal douches, once, twice, or three times daily, as indicated by the amount of leakage through the opening. If the opening is very small, stimulation by touching it occasionally with silver nitrate stick, or with carbolic acid, will sometimes cause the fistula to close. If the fistula persists after thorough recovery from the parturition, it may be closed by operation.

Operative Treatment.—The preparation of the patient, operator, instruments and dressings are the same as for complete laceration of the pelvic floor. This apparently simple operation is frequently a disappointing one, on account of infection from the rectum preventing healing, even in spite of the care and skill of those specially trained and experienced in this operative field. A point to be kept in mind is that every failure adds to the difficulty of subsequent repair, hence operation should not be undertaken unless one is prepared to deal with the condition in a thorough way.

Other Fecal Fistulae

Occasionally there occur other varieties of fecal fistula, opening into the genital tract. There may be an opening into the vagina from the sigmoid flexure or from the colon or from the small intestine. There may be an opening into the uterus from the sigmoid or from the colon or from the small intestine.

VESICOVAGINAL FISTULA

There may be an opening between the genital tract and the urinary tract at one of several situations (Fig. 536). The location is indicated by the name as follows:

Urethrovaginal Fistula—Between Urethra and Vagina.
Vesicovaginal Fistula—Between Bladder and Vagina.
Ureterovaginal Fistula—Between Ureter and Vagina.
Vesicouterine Fistula—Between Bladder and Uterus.
Ureterouterine Fistula—Between Ureter and Uterus.

All of these fistulae are rare, the most common being the vesicovaginal. A **vesicovaginal** fistula is an opening from the bladder into the vagina. The size of the fistula may vary from a small opening, permitting only slight leakage, to a large opening through which all the urine passes.

Etiology

The following are the causes of the vesicovaginal fistula:

1. *Injuries in Labor.*—In prolonged labor where the lower portion of the bladder is caught and held for several hours between the head and the pubic bone, sloughing may follow. Part of the base of the bladder and the anterior vaginal wall are bruised, the circulation is more or less cut off, the parts become gangrenous and after a few days the slough separates, leaving a vesicovaginal opening through which the urine passes. Such injuries are rare in recent years on account of the great improvement in obstetric teaching and practice. Now, the head is not permitted to remain for several hours in such a position that it makes serious pressure on the bladder. If the head does not advance satisfactorily within a reasonable time after the rupture of the membranes, the child is delivered by forceps or otherwise.

A still rarer form of damage to the bladder in labor is that in which the bladder is torn directly, either by the manipulations incident to a version or by the forceps. In that case the dribbling of urine is noticed immediately, or within a few hours after labor, whereas if the fistula is due to sloughing, there is no escape of urine until the separation of the slough, which requires several days.

2. *Chronic Ulceration* of the anterior vaginal wall or the base of the bladder. The ulceration may be chancroidal, syphilitic, or tuberculous.

3. *Malignant Disease* of the vesicovaginal septum is usually secondary to cancer of the cervix uteri.

4. *Operations.*—One of the methods of treating severe chronic cystitis is to make an opening from the vagina into the base of the bladder, so as to give constant drainage of the latter. Such an opening usually closes spontaneously a short time after the drainage tube is removed. It may, however, fail to close promptly after its usefulness is ended, and in that case becomes a vesicovaginal fistula, requiring operation. Another cause is accidental injury of the bladder during hysterectomy.

Diagnosis

The patient complains of urine coming from the vagina and of much vaginal irritation. In some cases the patient complains simply that she cannot control the urine.

Digital examination reveals a rough place on the anterior vaginal wall. If the opening is large, it may be distinctly made out with the finger. If the opening is small, only a slight elevation or depression or rough place may be felt. Upon inspection, if the opening is large, it may be seen, but if it is small, only a red papule marks the site. If the opening be watched a few minutes, urine may be seen escaping from it. Cystoscopic investigation shows the location and size of the opening in the bladder. If the diagnosis is doubtful, sterile methylene blue solution may be injected into the bladder and its appearance watched for at the supposed vaginal opening of the fistula. There is another condition which must be carefully differentiated from vesicovaginal fistula, namely, ureterovaginal fistula.

When the vesicovaginal opening is large, the fact that it communicates with the bladder is apparent, and the margins of the opening and the adjacent surfaces of the vaginal mucosa and vesical mucosa are frequently encrusted with the phosphates from the decomposed urine. In one of our cases there was a large phosphate stone nearly filling the contracted bladder and projecting through the large vesicovaginal opening into the vagina.

The irritation caused by the decomposition of urine in the vagina is very great, and the constant odor of decomposing urine combined with the constant leakage of fluid, soaking pads and clothing, makes the patient miserable.

Treatment

If the fistula is due to malignant disease, no attempt should be made to close it unless the malignant infiltration is so situated that it can be completely extirpated. In the inoperable cases, local cleanliness and local sedatives are indicated.

If the fistula has resulted from sloughing after labor or from operation, it is best to postpone the operation for repair until the patient has fully recovered, and the tissues have become strong enough to hold the sutures well. During the time the patient is waiting, palliative treatment will be necessary.

Palliative Treatment consists in keeping the parts clean and in receiving and disposing of the urine so that it does not come in contact with the clothing. To accomplish the first object, a urinary antiseptic such as urotropin should be

given internally. Also a vaginal douche of borax (a tablespoonful to a quart of water) or a weak carbolic douche (½ per cent) should be given two or three times daily, and the external genitals should be washed frequently with a carbolic wash. If there is much vulvar irritation, the measures mentioned under Acute Vulvitis may be employed. Some relief may be given by coating all surfaces, with which the urine comes in contact, twice daily with benzoated zinc-oxide ointment.

For catching the urine and protecting the clothing from constant contamination, one of the urinals found in the instrument stores may be helpful. Many types of apparatus have been devised to relieve the discomfort of these patients. Figs. 537 and 538 show a special bed pad which has proved practical and useful in this matter. The quotation is from the description by Murphy.

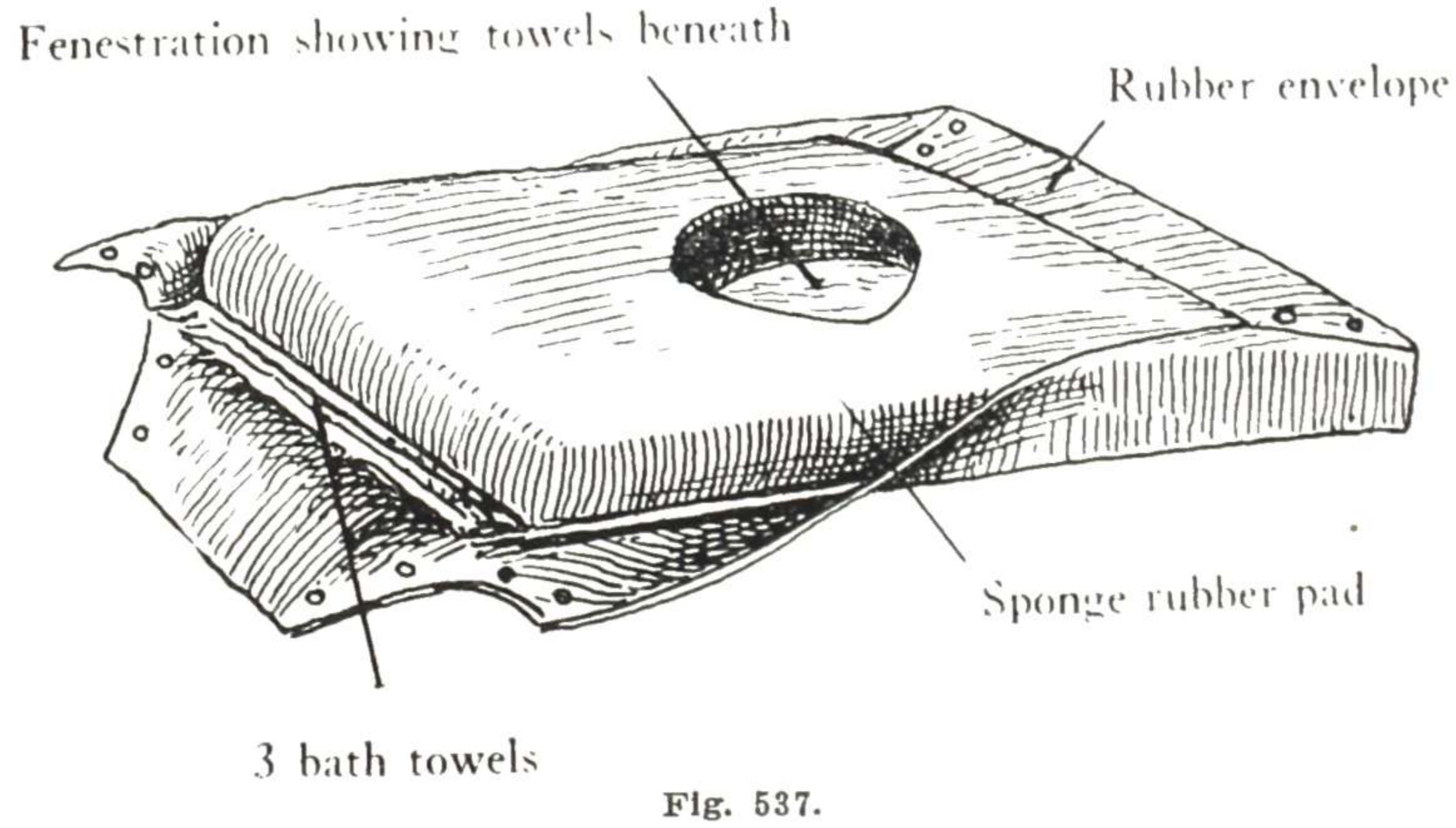


Fig. 537.

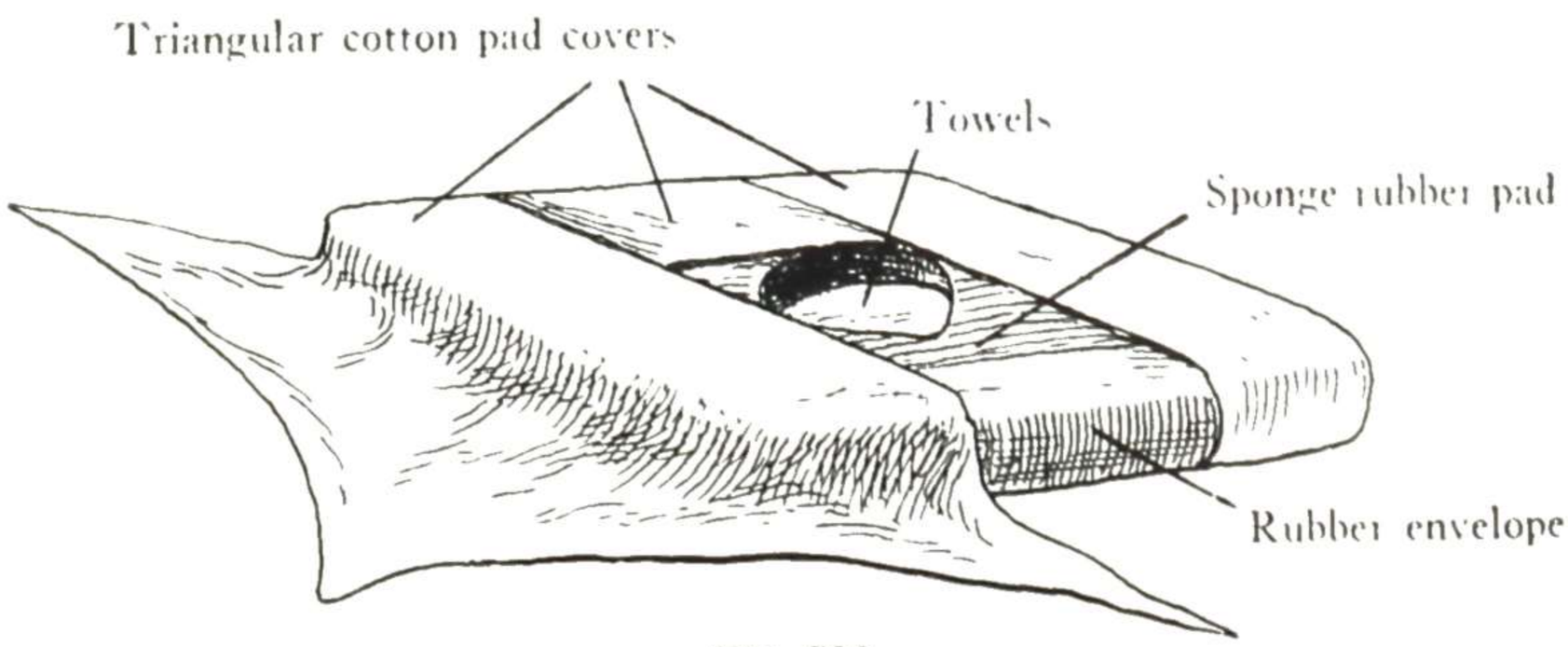


Fig. 538.

Figs. 537 and 538.—A special pad for keeping the patient dry in bed in cases of vesicovaginal fistula. (Murphy—*Am. J. Obst. & Gynec.*)

Patients having inoperable, vesicovaginal fistulas suffer much distress from being constantly wet. At night, the necessity of getting out of bed, in order to remove wet clothing, interrupts their sleep to such an extent that a full measure of rest is impossible. Furthermore, the heat of the body hastens the decomposition of the urine, which is absorbed by the clothing, with the production of the well-known disagreeable odor, distasteful to patient and family alike. The device shown eliminates the above difficulties, for by its use, the patient is able to remain dry, and at the same time experiences no odor of decomposing urine.

The apparatus consists of two parts, a rubber pad and an envelope. The pad is made of sponge rubber and measures 18 by 24 by 3 inches. It possesses a centrally placed fenestration, measuring approximately 8 by 8 inches, which is somewhat the shape of a

toilet seat. The sponge rubber is entirely covered by having cemented to its surface a sheet of smooth, soft texture rubber.

The envelope fits the pad, for which purpose its corners are mitered and supplied with metal snap fasteners; it is made of the same fine quality rubber sheeting as is cemented to the pad. Additional equipment includes bath towels to absorb the urine, and three triangular pieces of cotton cloth, to protect the patient's body from the rubber.

The bed is prepared for sleeping in the usual manner. Several bath towels are placed in the bottom of the rubber envelope, and upon these is laid the rubber pad. The corners of the envelope are then fastened. Next, the pad and envelope are placed across the bed with the tapered end of the fenestration toward the foot. The pad is covered by using the three triangular pieces of cotton cloth as shown in Fig. 538. The two pieces covering the ends of the pad are applied last, since they are the ones which might possibly get wet. Either of these end pieces can be removed independently, without the patient being required to get out of bed to do so. In actual practice, however, the wetting of these covers is very rare.

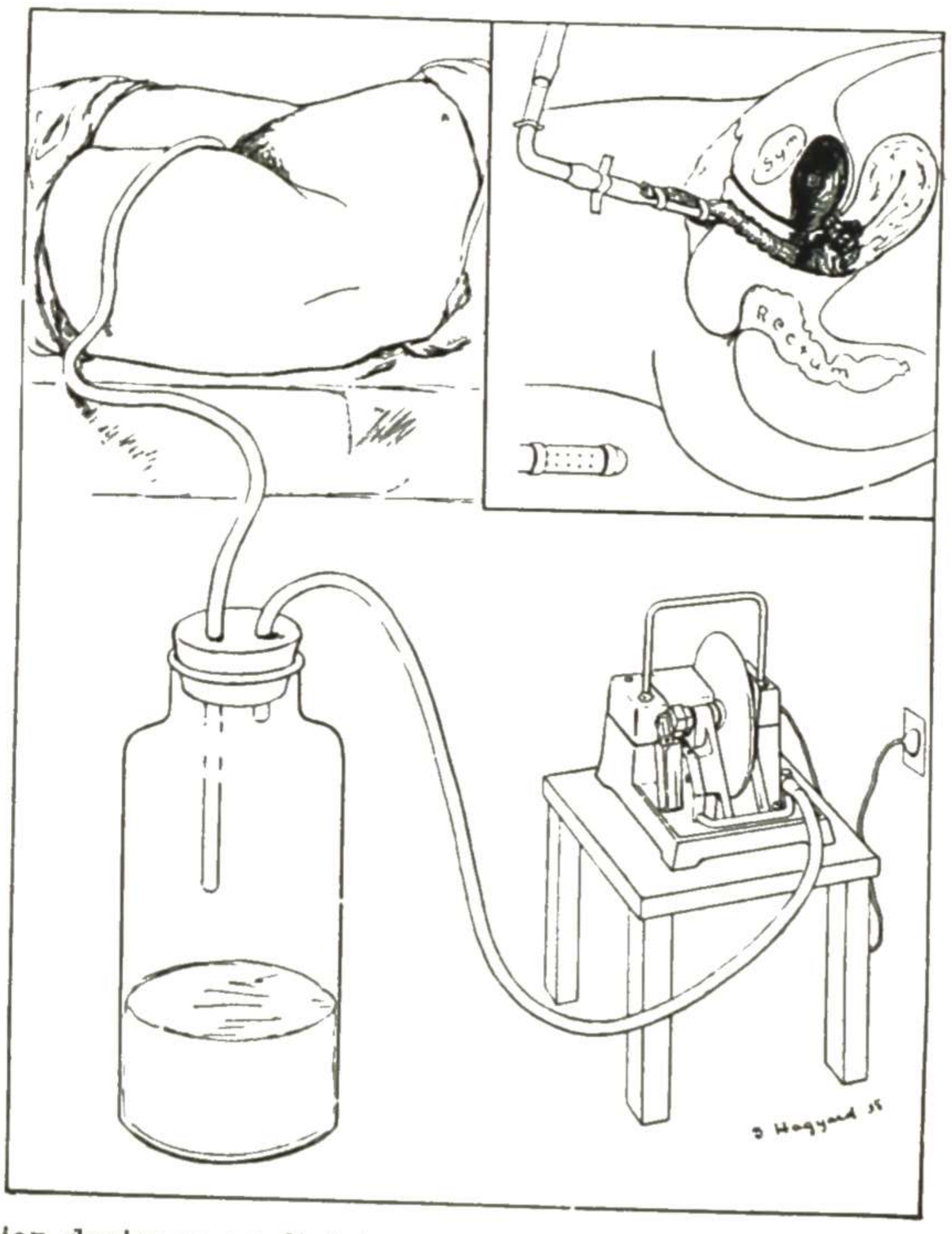


Fig. 539.—Suction drainage applied to vagina for urinary fistula. Tubing from catheter is led into a trap bottle to which mild suction is applied by means of a Stedman electric suprapubic pump. Insert in upper right shows gauze wick in vagina. The outer end of the gauze is held against the perforations in the end of the catheter. The catheter is taped on to the inner thigh and does not enter the vagina. (Saltzstein—*Surg., Gynec. & Obst.*)

In order to create an even sleeping surface, patients can make themselves comfortable by utilizing pillows. The consistency of the sponge rubber pad is such that the patient is not conscious of its presence when awake, and she can assume any position during the night and still remain dry.

The patient lies with her vulva overhanging the fenestration in the pad. The urine drops through the fenestration and is absorbed by the toweling, where it spreads out beneath the pad, and thus is not exposed to the patient's body heat. As a result, no offensive odor is produced. The following morning, the moist towels are removed, the pad and envelope are cleansed with a damp cloth, fresh towels replace the moist ones, and the apparatus is again ready for use. The rubber fails to absorb any odor from the urine.

The device was developed through the cooperation of Mrs. S. M., a patient in the Philadelphia Home for Incurables, who has been using it constantly for more than two

years. She had suffered from vesicovaginal and rectovaginal fistulas for more than eight years before she had the opportunity of using the present apparatus. She has found the bed pad to be the only satisfactory method for keeping herself dry at night.

Fig. 539 shows another type of apparatus for this purpose. It is an adaptation of continuous suction toward the solution of this difficult problem, and is presented by Saltzstein for the care of patients with vesicovaginal fistula from advancing cancer of the cervix. The following quotation is from his article, as are also the references to articles by Draper, Hendrickson, Kenyon, Lowsley, McCarthy, Stedman, and Tillotsen, which give a good survey of efforts in this direction.

When carcinoma of the cervix ulcerates into the floor of the bladder, a very disagreeable and uncomfortable condition ensues. To the infected necrotic cervix discharges is added the pooling of stagnant urine in the vagina, thus making this tender mucosa increasingly irritated, inflamed, and sore.

The care of this condition has been unsatisfactory. Transplantation of the ureters into the sigmoid has been considered, but at this stage of the disease the ureters are usually dilated from the stricture caused by cancer extension into the broad ligament, and the prognosis for length of life is too uncertain (2 to 6 months) to make this extensive operation practicable. Bilateral lumbar ureterostomy has been done occasionally with success.

The employment of a permanent urethral catheter will keep some patients dry if the hole in the bladder is high up near the cervix and is not too large. Very often the catheter soon irritates the urethra, however, and the patient demands its removal. Locally, we have tried to keep these patients comfortable by means of rubber sheet and double pads placed underneath the hips and thighs, and by giving them a supply of perineal pads which they may change as frequently as necessary (every 20 to 40 minutes). Some have used a sea sponge in the vagina. Others have used an inflated toy balloon.

Urologists have, during the past few years, made increasing use of continuous suction to carry off the urine from draining bladder wounds. The principles of applying suction to an open wound or orifice are that no vacuum be formed in the wound, and that there be no cupping action on the walls or bottom.

Various devices have been described to fit on to the body surface comfortably in order to dispense with drainage tubes or for use when these tubes are not needed. In all such devices a gauze wick lies in the urine or in the secretion to be absorbed. Air is sucked through a perforated catheter, tube, or mask attached to the gauze. The suction pulls the urine through the gauze, into the tubing, and then into a trap bottle.

The slightest suction or cupping pull in the vagina is painful, but a piece of gauze can be inserted into the vagina, attached to a perforated catheter outside the vaginal orifice, and the proper suction will transport the urine out into a bottle and keep the vagina clean. We have used the Hendrickson catheter attached to the Stedman electric suprapubic pump. This catheter ends in a flat spade-like tube, on one surface of which are 6 to 8 large perforations. A thick gauze wick is attached to this tube, and the free end is moistened and inserted three to four inches into the vagina. The catheter remains just outside the vagina. The tubing is then led over the patient's thigh to a gallon drain bottle on the floor. The pump is attached to the other tube of the bottle.

The vaginal wick must be changed as it becomes soiled, that is, every one or two days. No other care is necessary except the routine cleansing of tubing and bottle.

Operation.—Operation for vesicovaginal fistula should be undertaken only by those experienced in surgical work. Even a small fistula may be difficult to close, and is likely to be converted into a larger one by unsuccessful attempts. The operation must in each case be carefully planned, and be based on accurate knowledge of the relation of the fistula to the ureters and urethral sphincter and the extent of fixation of tissues to be used in repair. Details are given in the Operative Gynecology.

CHAPTER VI

DISPLACEMENTS OF THE UTERUS

Points in Anatomy

The uterus is situated about the center of the pelvic cavity (Fig. 540) with the body of the organ inclined forward, the long axis of the organ being directed to a point above the symphysis pubis, the direction varying in different individuals and in the same individual at different times. The uterus is not fixed in one position, but can be moved easily in all directions—upward, downward, forward, or laterally. It is pressed somewhat backward in the pelvis when the bladder is distended and somewhat forward when the upper part of the rectum is distended.

It is clear, therefore, that the uterus possesses normally a considerable range of mobility, and it is only when it remains beyond the normal range that it can be said to be displaced.

What Holds the Uterus in Normal Position? As just stated, there is nothing that holds the uterus immovably in any one position. By a combination of several factors it is prevented, ordinarily, from going beyond certain limits, and is permitted free mobility within those limits.

The factors that thus assist in maintaining the uterus within normal limits are the pelvic floor, the broad ligaments, the uterosacral ligaments, the round ligaments, the normal weight and size of the uterus, and the normal tone and fullness of the pelvic tissues. The combination of supporting and balancing and guy-rope action of these structures is suggested by the somewhat similar combination in the working of a swing (Fig. 541).

Kinds of Displacement

There are three kinds of uterine displacement which constitute clinical entities requiring separate consideration, namely, retrodisplacement, prolapse, and inversion. Anteflexion of the cervix is the designation applied to the condition in which the cervix bends forward so that its axis is directed along the vaginal canal, instead of across it as normally. This condition is nearly always a developmental defect due to persistence of the fetal position of the cervix. The corpus uteri develops forward normally but the cervix fails to assume its normal direction. The simple position of the cervix causes no disturbance. The imperfect development is the important factor in the frequently associated dysmenorrhea and stenosis of the cervical canal, and hence the condition is best considered along with other developmental defects in Chapter XIII.

Anterior displacements of the corpus uteri and lateral displacements of the uterus occur only as incidental conditions in the course of other diseases, usually an enlarging tumor or abscess, and hence do not require separate consideration.

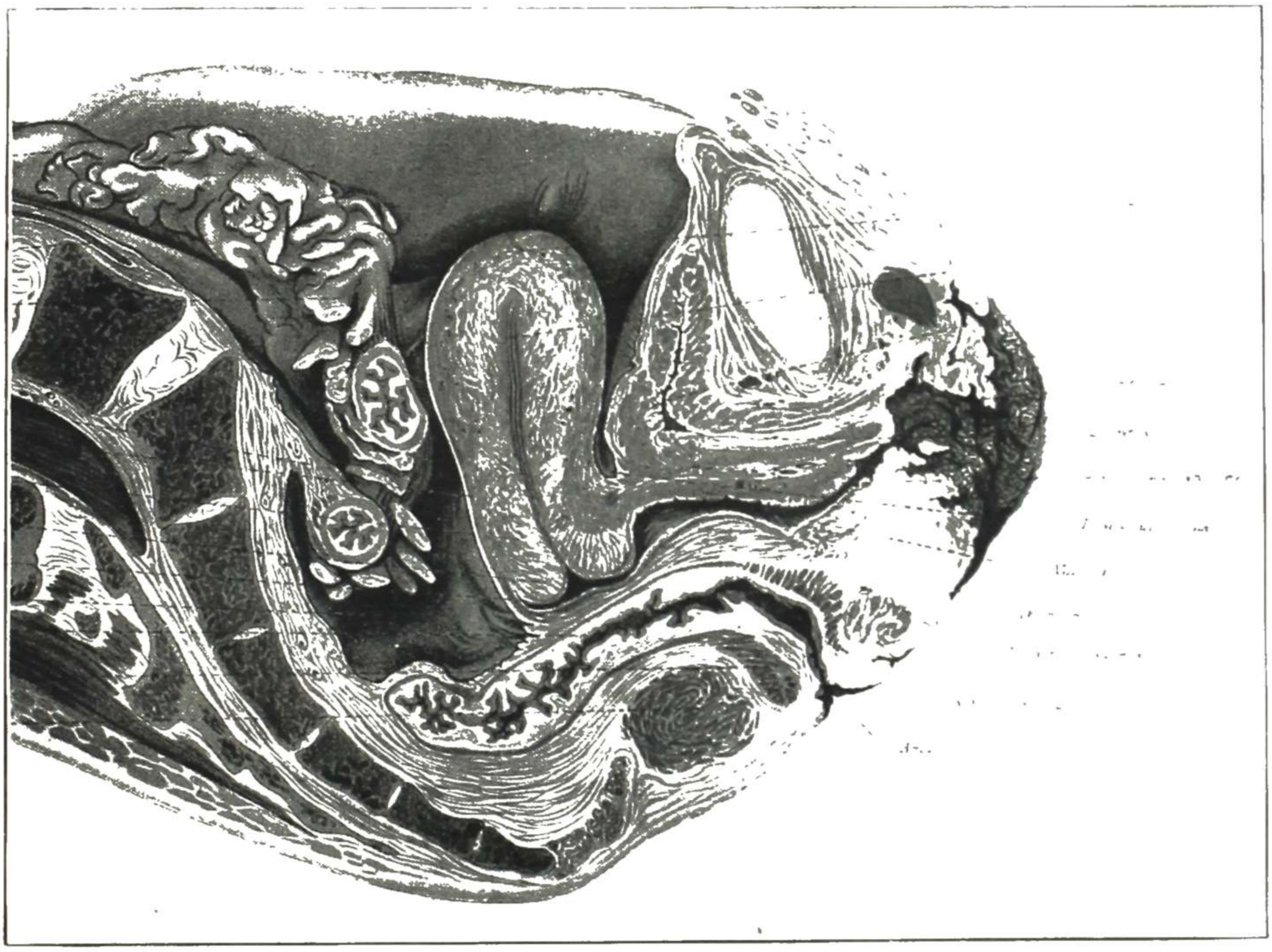


Fig. 540.—Section of a frozen body, showing the normal position of the uterus. (Sellheim—*Weibliches Becken.*)

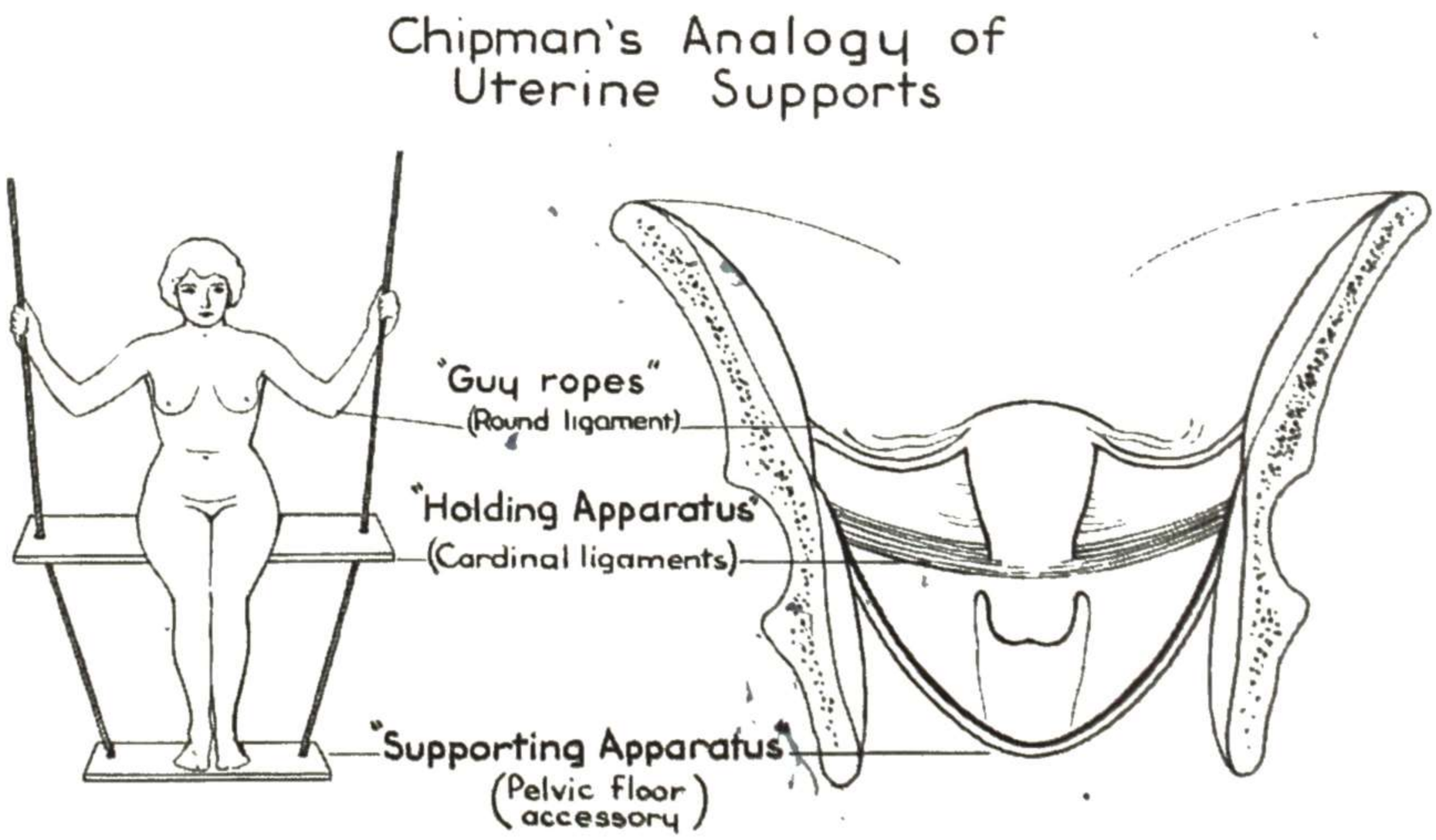


Fig. 541.—The coordination of supporting structures, which permit required movements of the uterus and yet hold it within normal limits, is well represented by the components of a swing supporting the body as in this illustration (Ward, after Chipman—*Southern Surgeon*).

RETRODISPLACEMENT OF UTERUS

Backward displacement of the uterus occurs in four forms. The most common form is shown in Figs. 542 to 544. It is a combination of version and flexion. The whole uterus is turned back to a certain extent and then the corpus is bent back still farther. If it is desired to go beyond the general diagnosis of retrodisplacement and specify the particular type, this common type could be designated "retroversioflexion." Occasionally a pure retroflexion, as shown in Fig. 545, or a pure retroversion as in Fig. 546 is encountered, but they are infrequent. There is a still rarer type, in which a uterus

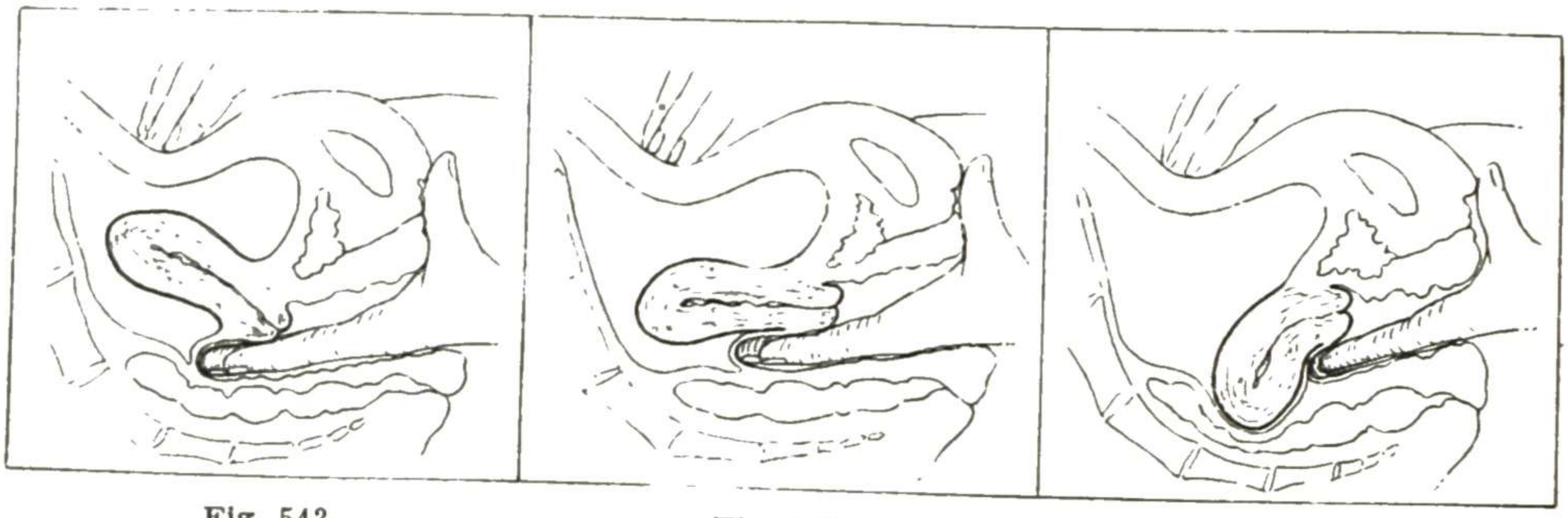


Fig. 542. Fig. 543. Fig. 544.

Figs. 542-544.—The three degrees of retrodisplacement of the uterus and the touch signs of each. Fig. 542, First degree—corpus out of reach of examining fingers, both above and below. Fig. 543, Second degree—vaginal fingers feel posterior surface of corpus uteri extending directly back. Fig. 544, Third degree—vaginal fingers impinge on corpus uteri turned down into the posterior cul-de-sac.

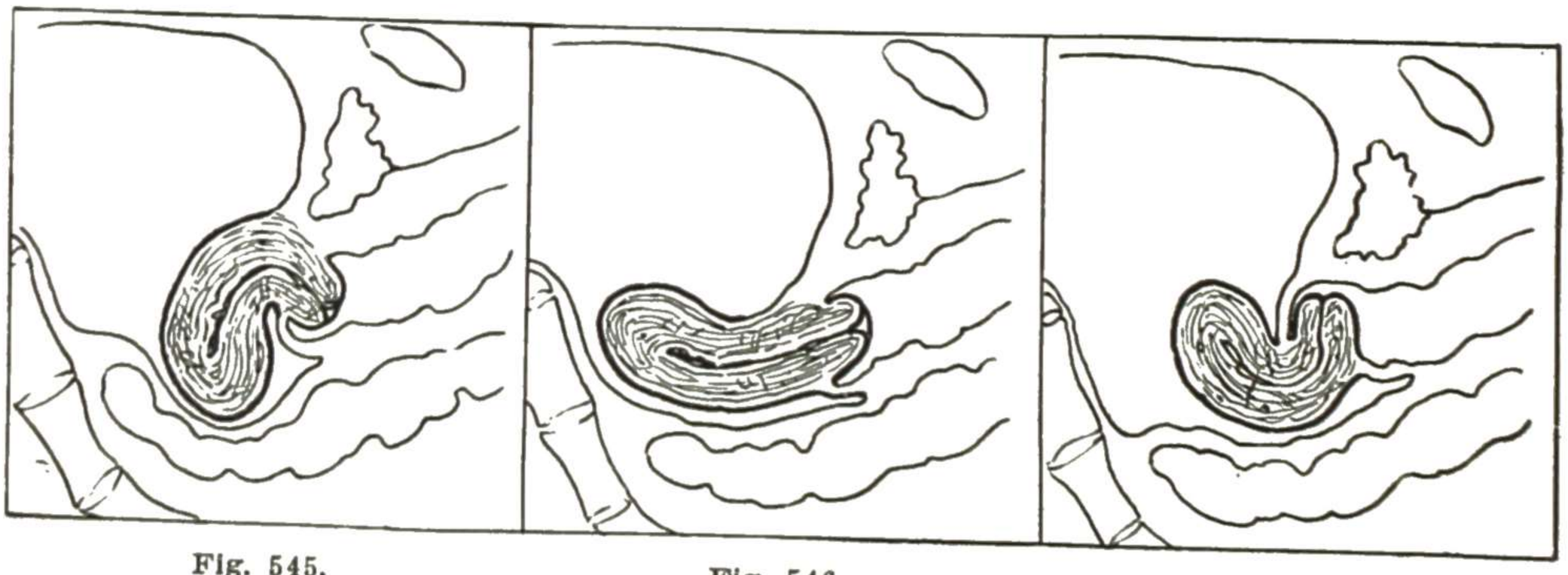


Fig. 545. Fig. 546. Fig. 547.

Figs. 545-547.—Retroflexion and retroversion of uterus. Fig. 545, Pure retroflexion, the corpus uteri being *bent* sharply back while the cervical axis is maintained in its usual relation with the vagina. Fig. 546, Pure retroversion, the whole uterus being *turned* back while the relation of the corpus to the cervix is undisturbed. Fig. 547, Retroversion of a uterus with an anteflexed cervix.

A pure retroflexion or pure retroversion is a rarity, nearly every case being a combination of the two, hence the use of the term "retrodisplacement" which covers both flexion and version.

with an anteflexed cervix becomes turned backward in the pelvis, as shown in Fig. 547. The descriptive designation of this would be "retroversion of uterus with anteflexion of cervix." It has been referred to as "retrocession," but that is only a general term meaning "a going back" and hence does not indicate the special condition present.

In general when the uterus is found back, the diagnosis should be "retrodisplacement of uterus," avoiding the terms "retroversion" and "retroflexion"

except in those cases in which the physician has been able to examine deeply enough really to differentiate the different types. In many cases, owing to the difficulties of deep pelvic palpation, one is doing well to determine definitely that the uterus is retrodisplaced. "Retrodisplacement" is the term the authors shall use generally in referring to backward displacement of the uterus. It includes retroversion and retroflexion and any combination of the two.

Etiology

Retrodisplacement of the uterus may be due to causes connected with childbirth (relaxed floor, subinvolution) or to nonpuerperal causes, such as developmental defect or enlarging tumor. Developmental defect as an etiological factor is often overlooked. On account of imperfect development, the infantile position of the uterus persists to some extent. In such cases the imperfect tissue development of uterus and adjacent structures is likely to be a larger factor in the causation of symptoms than the simple backward position of the uterus.

Knowing that a large proportion of retrodisplacements are due to the stretching of the supports in childbirth and the backward tendency of the heavy subinvoluted uterus, preventive measures are employed. These consist of measures to aid normal involution of the uterus and adjacent tissues postpartum and avoidance of conditions which would interfere or which would put extra strain on weakened structures during the process of repair. The backward tendency of the heavy uterus is counteracted by (a) having the patient lie on the abdomen or side during convalescence rather than on the back and (b) beginning the knee-chest posture program after the pelvic blood-vascular system is sufficiently readjusted and stable to eliminate the danger of embolism —that is, in four to six weeks after delivery if the uterus is found in retrodisplacement on check-up examination at that time.

Falls may be disregarded as a cause of retrodisplacement of the normal uterus. As previously explained, the uterus is not fixed but is normally movable within wide limits, and provision is made for its return to the normal position after these physiologic excursions. The uterus is so well protected from jars and shocks that only a severe injury which breaks the protecting bony pelvis is at all likely to cause pathologic retrodisplacement, and then only through direct change in the adjacent structures by injury or exudate.

Pathology

The essential pathologic change is indicated in the name and in the definition. The amount of backward displacement may be very conveniently expressed as first or second or third degree. In retrodisplacement of the **first degree,** the fundus lies just about at the promontory of the sacrum, in the **second degree** the fundus lies in the hollow of the sacrum, while in the **third degree** it lies well down in the cul-de-sac below the level of the internal os (Fig. 544). Of course, in practice all gradations are found, from the normal position to the most marked backward displacement. The exact dividing line between the different degrees is not distinct and the division into first and second and third degrees is an artificial one, but it is convenient and usually cases on examination may be placed in one class or the other and so recorded.

Symptoms

The symptoms accompanying retrodisplacement of the uterus are due principally to the complications. There has been some question as to whether uncomplicated retrodisplacement causes any symptoms. In many cases where retrodisplacement is found it is clearly incidental, the symptoms being due to some other condition. It is important to recognize this fact and to differentiate accurately the cause of the patient's distress before subjecting her to operation or other troublesome treatment for the retrodisplacement. This incidental symptomless retrodisplacement is found principally in the nonparous and in the aged. In the active childbearing period the uterus is large and heavy, and troublesome discomfort may result from circulatory disturbance which in a less active uterus would be unnoticed. Consequently it is in such cases that correction of a movable retrodisplacement by pessary and knee-chest posture may give complete relief.

Retrodisplacement of the uterus may cause discomfort or may aggravate distress due to other lesions, the latter being the combination condition present in most cases requiring operation. The principal associated symptoms are menorrhagia, backache, leucorrhea, bladder and rectal distress, and sterility.

Diagnosis

The symptoms mentioned are common to many diseases and hence are not at all distinctive of retrodisplacement. The **diagnosis** of retrodisplacement must rest upon the physical examination. In examining the patient it is found usually that the cervix is lower and farther forward than is normal, and that it also points forward.

When making the bimanual examination, search is made for the body of the uterus in its normal location, by placing the ends of the fingers in the front of the cervix and pushing the cervix upward and backward and at the same time pressing the fingers of the other hand into the pelvis from above. In retrodisplacement it is not there so placing the vaginal fingers back of the cervix and making bimanual examination, a mass is found back of the cervix, which is about the size and shape of the body of the uterus and apparently continuous with the cervix.

If the uterus is in only the first degree of retrodisplacement (Fig. 542), the fundus may be so high as to be out of reach of the vaginal fingers, and yet far enough back to be out of reach of the fingers above. The difficulty is much increased if the patient holds the abdominal muscles tense. In these cases the body of the uterus may sometimes be raised so that it can be felt by the abdominal hand by pushing up the cervix with the fingers in the vagina. This lifts the whole uterus—body and all. If the displacement is marked (that is, second or third degree), the fundus can usually be felt by the vaginal fingers, back of the cervix (Fig. 544). When a mass is felt in front or behind the cervix, it must then be determined whether or not the mass is the corpus uteri. Figs. 548 to 559 show the principal conditions that must be taken into consideration in the differential diagnosis.

The differential diagnosis is made by making out the position, size, shape, consistency, tenderness, mobility and attachments of the mass, as explained under Gynecologic Examination (Chapter II).

Determine Mobility.—After having determined that the body of the uterus is backward, and about how far backward, the next point to determine is whether or not it is freely **movable.** The vaginal fingers are pressed well in

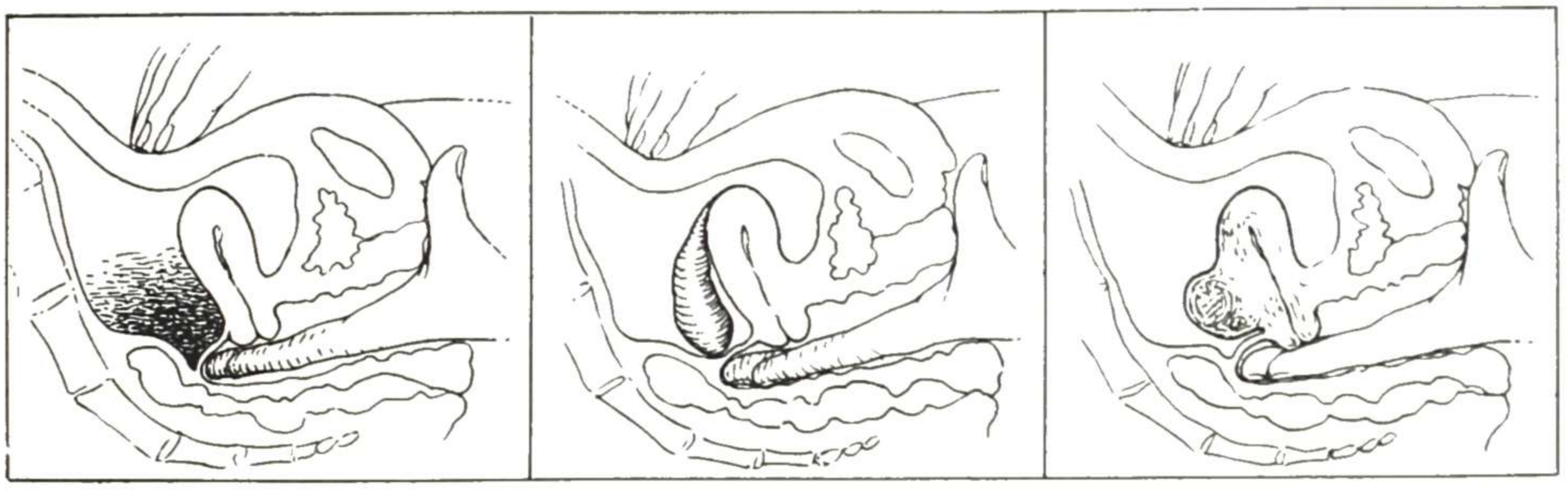


Fig. 548. Fig. 549. Fig. 550.

Figs. 548-550.—Differential diagnosis of retrodisplacement of uterus. Conditions simulating retrodisplacement. Fig. 548, Inflammatory exudate in the cul-de-sac, which may be mistaken for retrodisplacement when corpus uteri is not identified above on account of a thick or tense abdominal wall. Fig. 549, Tubal mass in cul-de-sac simulating the corpus uteri in that situation. Fig. 550, Myoma of the posterior uterine wall which may cause considerable difficulty in differential diagnosis from retrodisplacement.

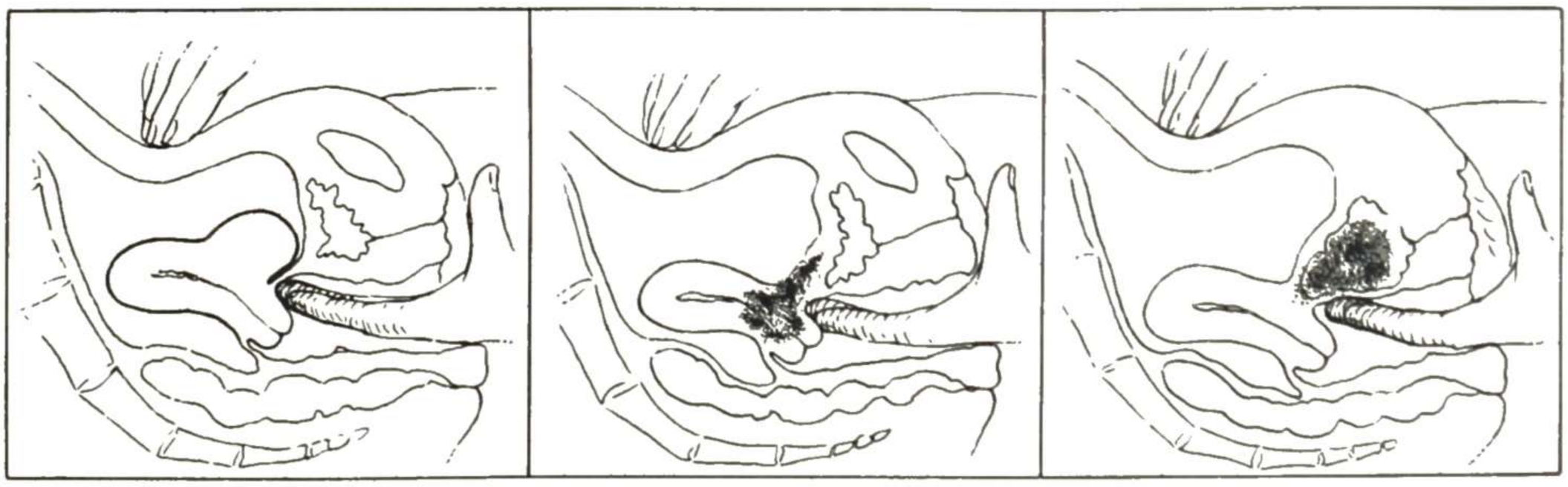


Fig. 551. Fig. 552. Fig. 553.

Figs. 551-553.—Differential diagnosis of retrodisplacement of uterus. Conditions that may obscure a retrodisplacement. Fig. 551, Myoma of anterior uterine wall that simulates the corpus uteri. Fig. 552, Uterine carcinoma with infiltration in front of cervix that may be mistaken for the resisting corpus uteri. Fig. 553, Tumor of bladder that gives a resisting mass in the general position of the corpus uteri.

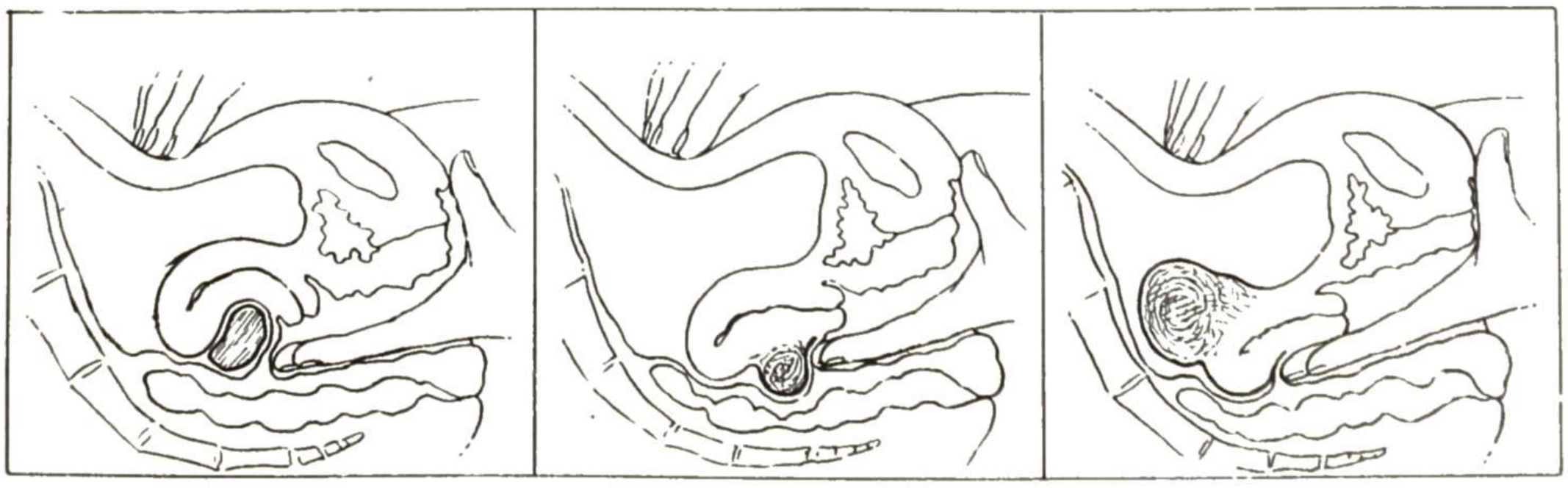


Fig. 554. Fig. 555. Fig. 556.

Figs. 554-556.—Differential diagnosis of retrodisplacement of uterus. Complicated cases of retrodisplacement. Fig. 554, Adnexa prolapsed under the retrodisplaced uterus. Fig. 555, Myoma in the posterior wall of the retrodisplaced uterus. Fig. 556, Myoma on the anterior part of the fundus of the retrodisplaced uterus.

under the fundus, and an attempt is made to lift it (Figs. 560 to 563). If it cannot be raised from its position, it is fixed. The fixation may be due to adhesions or to the fundus being caught under the promontory of the sacrum. To determine which condition is present, catch the cervix with the tenaculum forceps and pull it downward and forward (Fig. 564). This maneuver pulls the uterus forward and away from the promontory. Then, while holding the uterus in that position, the fundus may be lifted past the promontory (Fig. 565), provided it is not otherwise held. If the uterus still cannot be raised, it is probably **adherent**—i.e., fixed in its false position by adhesions, the result

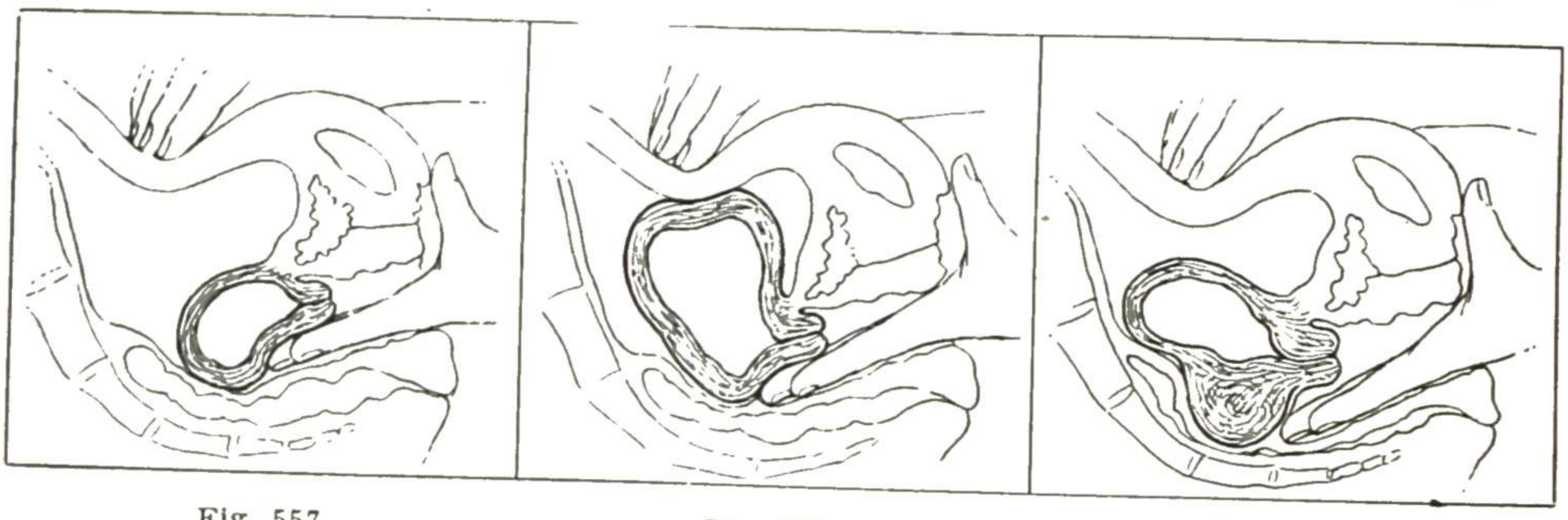


Fig. 557. Fig. 558. Fig. 559.

Figs. 557-559.—Differential diagnosis of retrodisplacement of uterus. Confusing conditions associated with early pregnancy. Fig. 557, Retrodisplacement with early pregnancy. Fig. 558, More advanced pregnancy with sacculation of the softened wall posteriorly. Fig. 559, Retrodisplacement with early pregnancy and a myoma in the posterior uterine wall. Keeping the possibility of such troublesome combinations in mind will often save an embarrassing mistake in diagnosis.

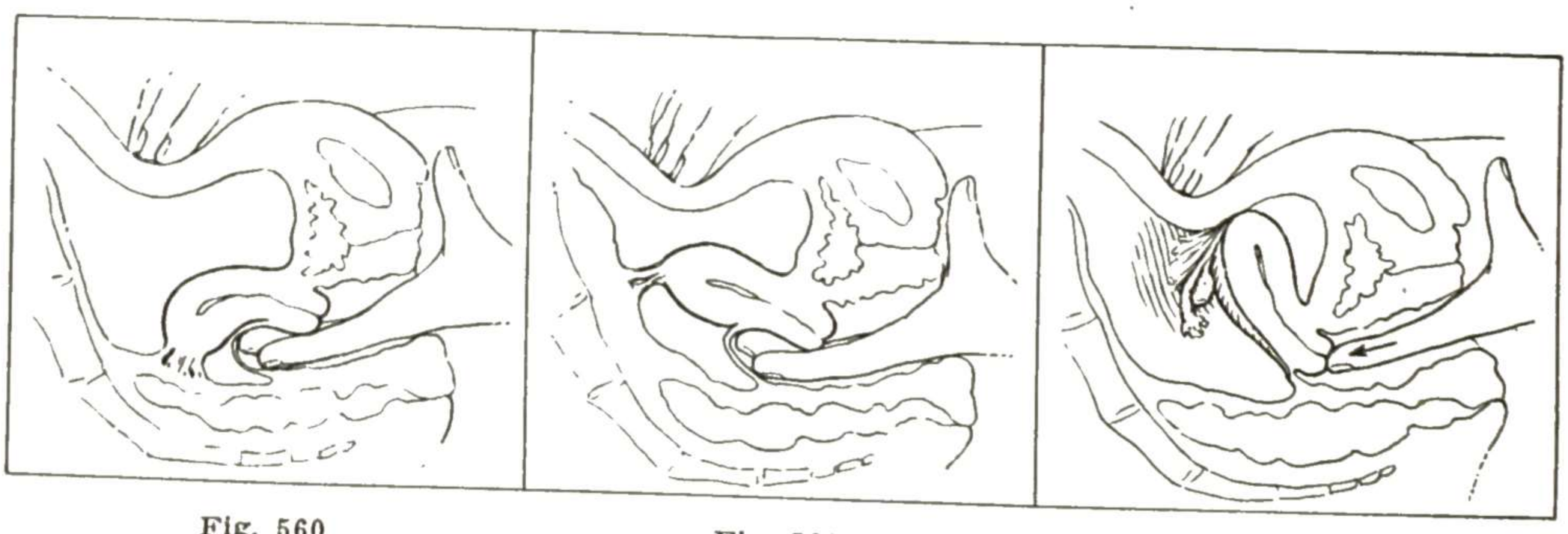


Fig. 560. Fig. 561. Fig. 562.

Figs. 560-562.—Determining the presence and extent of adhesions in retrodisplacement of the uterus. Fig. 560, The fundus uteri adherent low posteriorly. It cannot be gotten away from this region. Fig. 561, Adhesions higher. These usually permit considerable movement of the fundus uteri but it cannot be raised high enough to be caught with the abdominal fingers. Fig. 562, Light adhesions in the adnexal region. The fundus can usually be raised high enough to be caught with the abdominal fingers but does not come well forward or will not stay forward when released.

of inflammation. This probability is increased if there is evidence of inflammation about the tube on either side.

There is one other condition that may cause the uterus to be held in its backward position. Sometimes when the fundus lies low in the cul-de-sac, the sacro-uterine ligaments produce some constriction above it and prevent its return. This action of the sacro-uterine ligaments is increased if the cervix be strongly pulled upon. This is a rare condition and is possible only when the uterus is in the third degree of retrodisplacement.

Complications.—There are several conditions that frequently accompany retrodisplacement and that must be taken into consideration. For example, relaxation of the pelvic floor, chronic cervicitis, endometrial hyperplasia, chronic metritis, salpingitis with or without exudate and adhesions, and tumors of the uterus or adnexa.

The last two mentioned may cause trouble in determining the exact location of the body of the uterus. In examining a patient, do not stop when you find one lesion, but make a thorough examination and find all the lesions present.

Treatment

If there are no symptoms, no treatment is needed. But the patient should be kept under observation so that if symptoms do develop, effective treatment may at once be instituted before the case has run along and developed complications.

The treatment to be adopted depends on whether the uterus is movable or adherent.

WHEN THE UTERUS IS MOVABLE

In a case of retrodisplacement with movable uterus, the first step in the treatment is to **replace the uterus** to its proper position. There are two ways of doing this—by bimanual manipulation or by employment of the knee-chest posture.

Bimanual Replacement.—By the manipulation employed in the bimanual examination, the uterus is often replaced.

If it cannot be replaced by the ordinary bimanual examination methods, then catch and draw down the cervix with a tenaculum forceps (Fig. 564), and raise the fundus as high as possible with the fingers in the vagina. Then press the abdominal hand deeply into the back part of the pelvis, locate the promontory, and work along it into the pelvis back of the uterus (Figs. 565, 566). The fundus uteri is then brought forward and at the same time the cervix is carried backward, as shown in Fig. 567. After bringing the fundus forward, bend it well down over the vaginal fingers as shown in Fig. 568, in order to take out any backward flexion that may be present.

To carry out these manipulations successfully, the abdominal walls must be relaxed and the uterus not very tender. If the patient has a thick layer of adipose tissue, the examining fingers sometimes cannot get near enough to the uterine body to manipulate it satisfactorily. If the patient holds the abdominal walls tense, on account of pain or nervousness, the abdominal fingers cannot reach the uterus. If the uterus is inflamed and tender, the pressure necessary to these manipulations causes too much pain.

Knee-Chest Posture.—When the uterus, though movable, cannot be replaced by the bimanual manipulations, the knee-chest posture may be used. After the patient has been placed in this position (with the clothing about waist thoroughly loosened), the Sims speculum is introduced. The cervix is then caught with the tenaculum forceps and pulled forward. This brings the fundus uteri out from the promontory and permits it to fall forward into its proper position.

The cervix is then pushed well backward into the hollow of the sacrum, and a pessary or packing is put in to hold it there.

The old method of replacement by sound or repositor is mentioned only to be condemned. The sound or intrauterine repositor used in this way is dangerous. A uterus that is not adherent can usually be brought forward by one of the two methods already mentioned. In a uterus that is adherent the use of a sound or repositor is liable to lead to inflammation or perforation of the uterus.

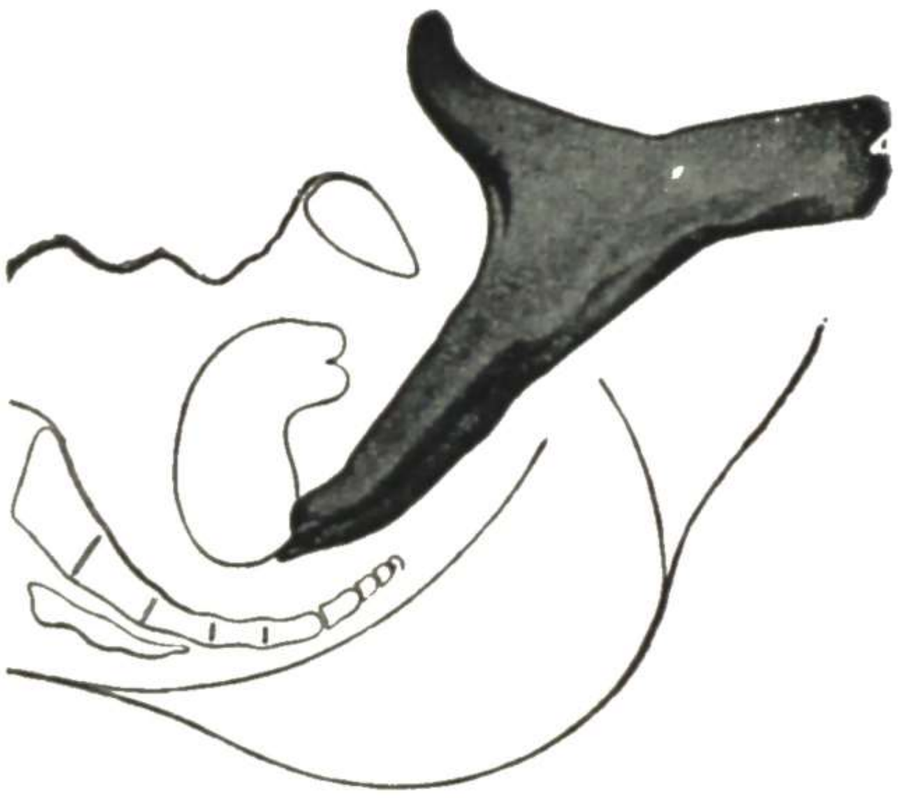


Fig. 563.

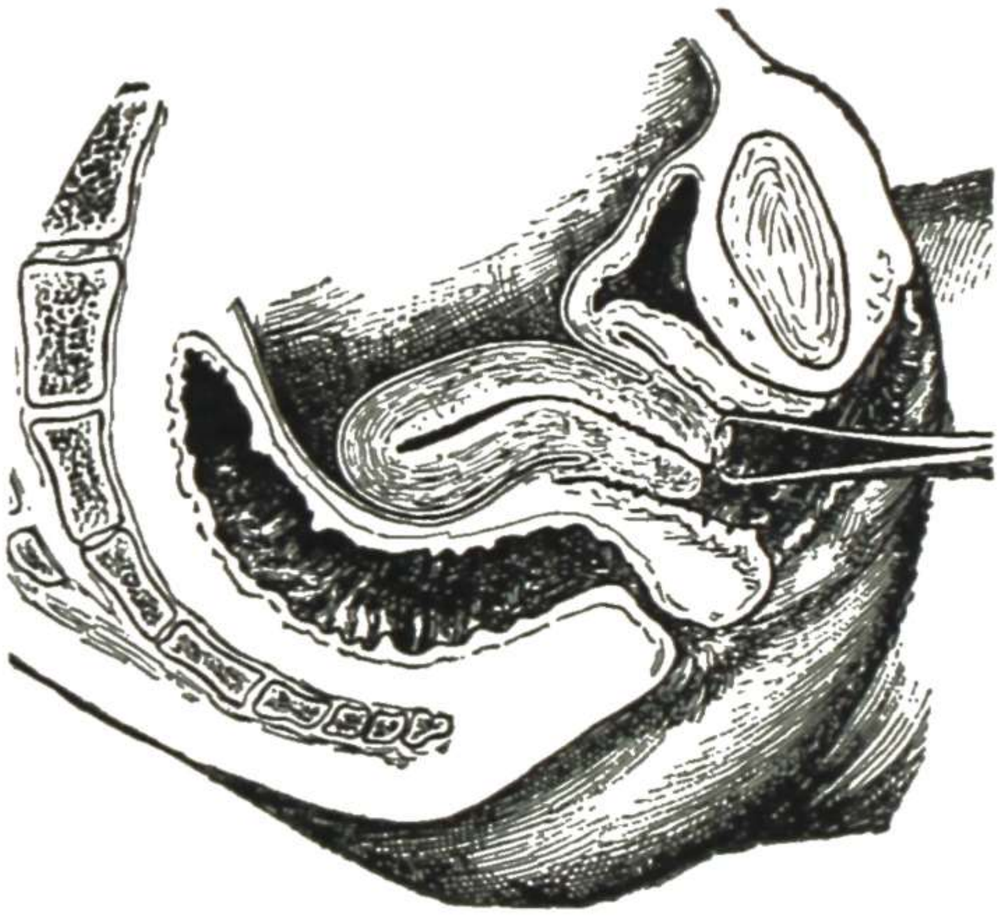


Fig. 564.

Fig. 563.—Attempting to raise the fundus uteri, to determine whether or not it is fixed. This is also the first step in bimanual replacement of the uterus. (Pryor—*Gynecology.*)

Fig. 564.—Bimanual replacement. Catching the cervix and pulling forward the uterus, so the fundus will be clear of the sacral promontory. (Kelly—*Operative Gynecology.*)

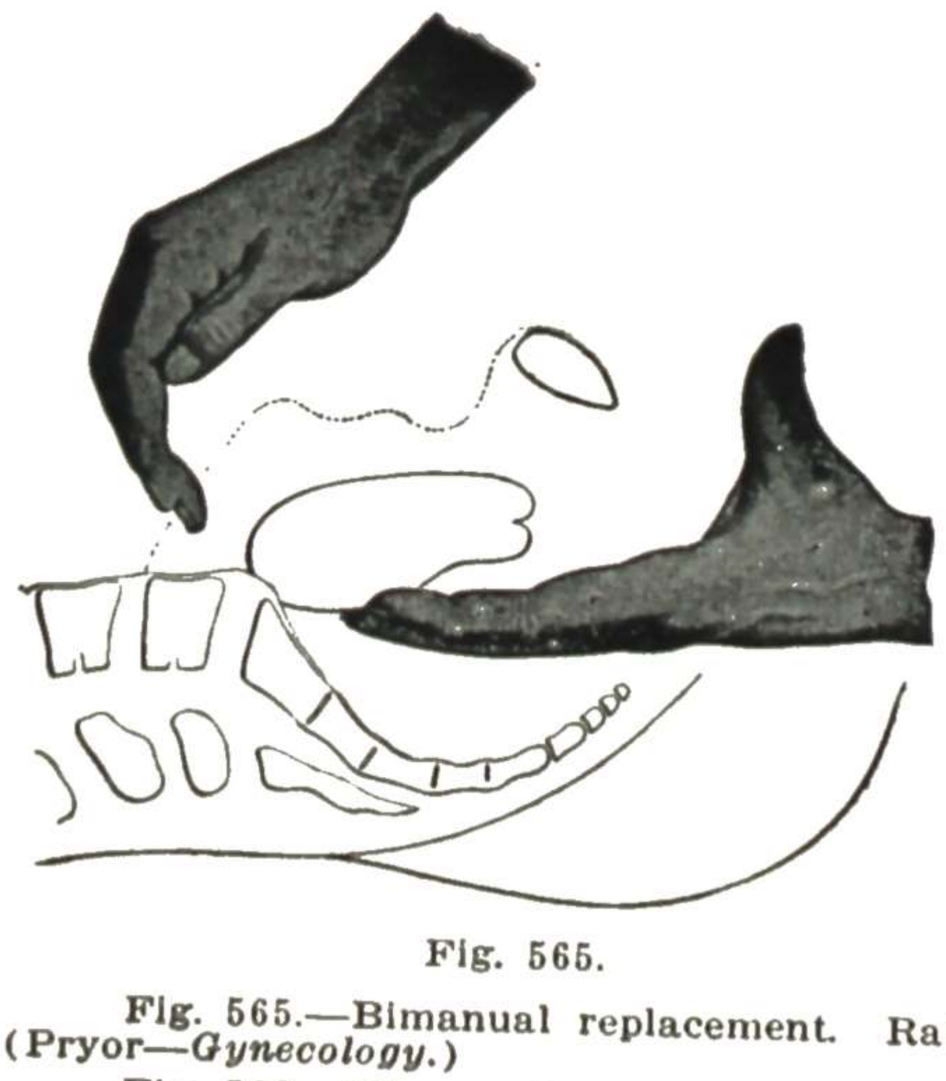


Fig. 565.

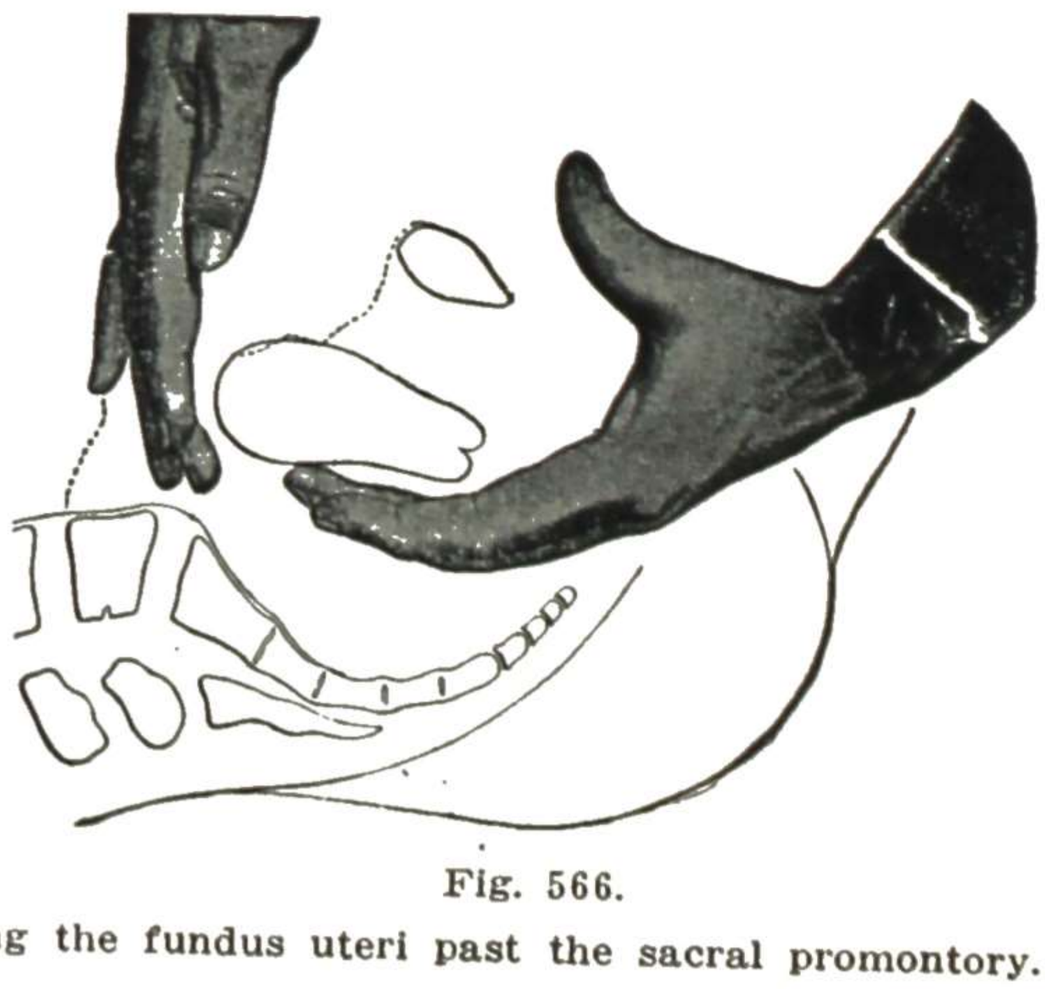


Fig. 566.

Fig. 565.—Bimanual replacement. Raising the fundus uteri past the sacral promontory. (Pryor—*Gynecology.*)

Fig. 566.—Bimanual replacement. Working the abdominal fingers down over the sacral promontory, so as to get behind the fundus uteri and bring it forward. (Pryor—*Gynecology.*)

In some cases the uterus and adjacent tissues are too tender to permit the manipulations necessary for replacement. In such a case, hot vaginal douches, purgatives, and the knee-chest posture morning and evening for a few days may diminish the tenderness very much. In such a case, after the knee-chest

posture has been taken morning and evening for a few days, the uterus may be found forward at the next examination.

The Pessary.—After the uterus has been replaced, then comes the problem of holding it there. The most convenient and efficient device for this purpose is the pessary. In uncomplicated cases this is often all that is needed.

Fig. 567.

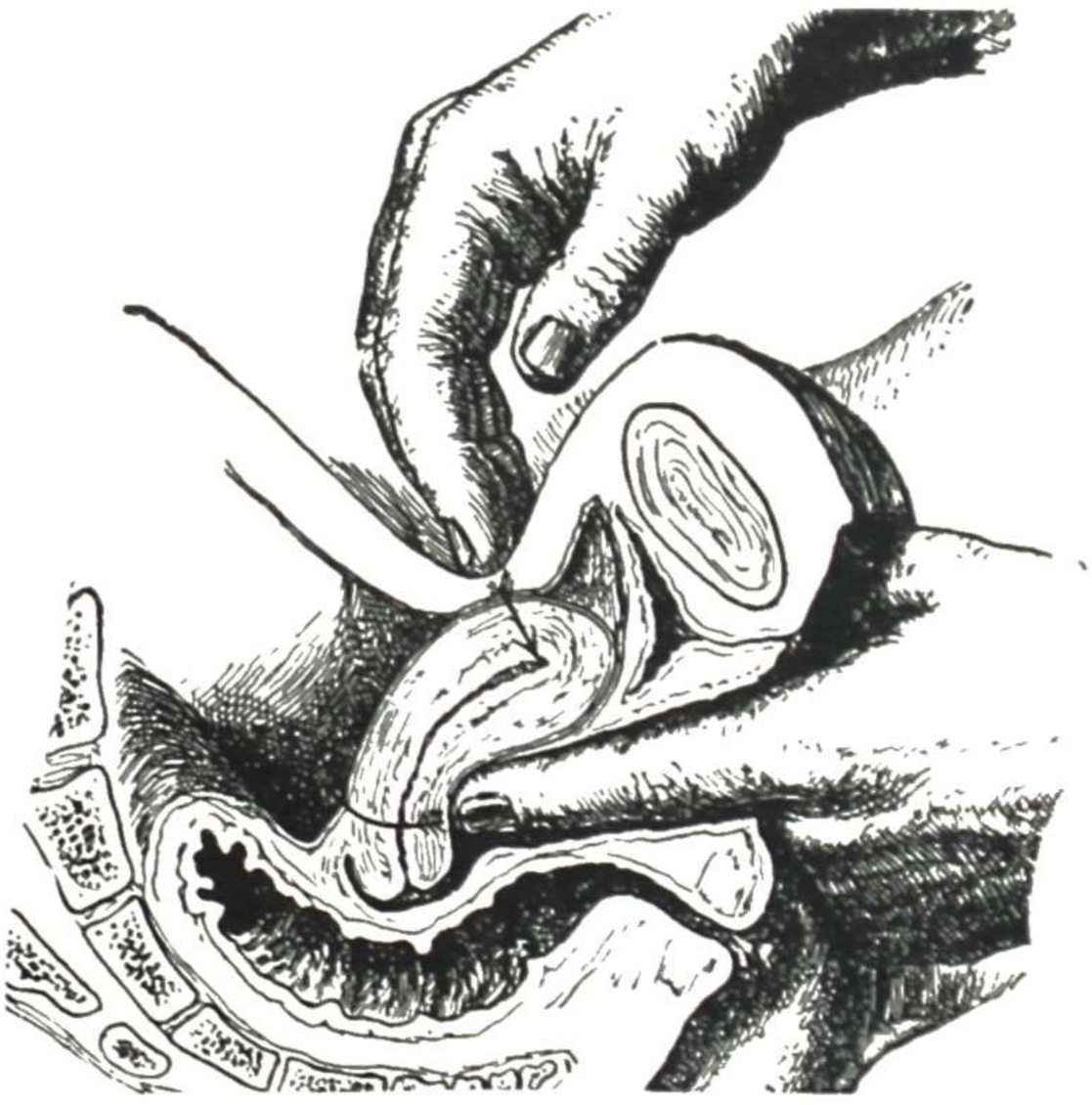


Fig. 568.

Fig. 567.—Bringing the fundus uteri forward and pushing the cervix backward and upward. (Kelly—*Operative Gynecology.*)

Fig. 568.—The uterus brought forward into position. This shows also the method of taking the backward flexion out of the uterus by bending it firmly forward over the vaginal fingers. (Kelly—*Operative Gynecology.*)

Varieties of Pessary

Innumerable forms have been recommended, and to attempt to mention all of them would be a waste of time. They have long been made of hard rubber and are now available in translucent plastic material. With the new chemical plastics as well as with the rubber pessaries, watch should be kept for possible allergic reaction with allergic patients. Both the hard rubber and the plastic pessaries may be molded by heating in hot water, thus permitting some adjustment to special conditions.

The following three forms are the principal ones used at present in the treatment of retrodisplacement, and they are sufficient in practically all cases in which a pessary is the preferable method of treatment.

1. **Hodge Pessary** (Fig. 569, *A*).—This pessary, devised by Hugh L. Hodge, professor of Diseases of Women in the University of Pennsylvania from 1835 to 1863, may be taken as the type of the hard rubber ring pessaries. It is the original model from which nearly all other pessaries of that character descended. It is still much used and, as explained later, is the most suitable one for certain conditions.

2. **Albert Smith Pessary** (Fig. 569, *B*).—Albert H. Smith modified the Hodge pessary in two important particulars. He narrowed the anterior end so that it fits well up into the narrow portion of the pubic arch, the point

projecting slightly into the arch. This tends to keep the pessary from turning or slipping about in the vagina and at the same time causes the anterior part of the pessary to lie higher—so that it is out of the way and does not interfere with coitus or with the introduction of a douche nozzle. His other modification was a lengthening of the posterior arm of the pessary. This pushes the posterior vaginal fornix further upward and backward, thus increasing the ability of the pessary to hold the cervix uteri well back in the pelvis.

3. **Thomas Pessary** (sometimes called the Smith-Thomas pessary).—T. Gaillard Thomas modified the Smith pessary by thickening the posterior end into a bulbous enlargement. This distributes the pressure over a larger surface of the posterior fornix.

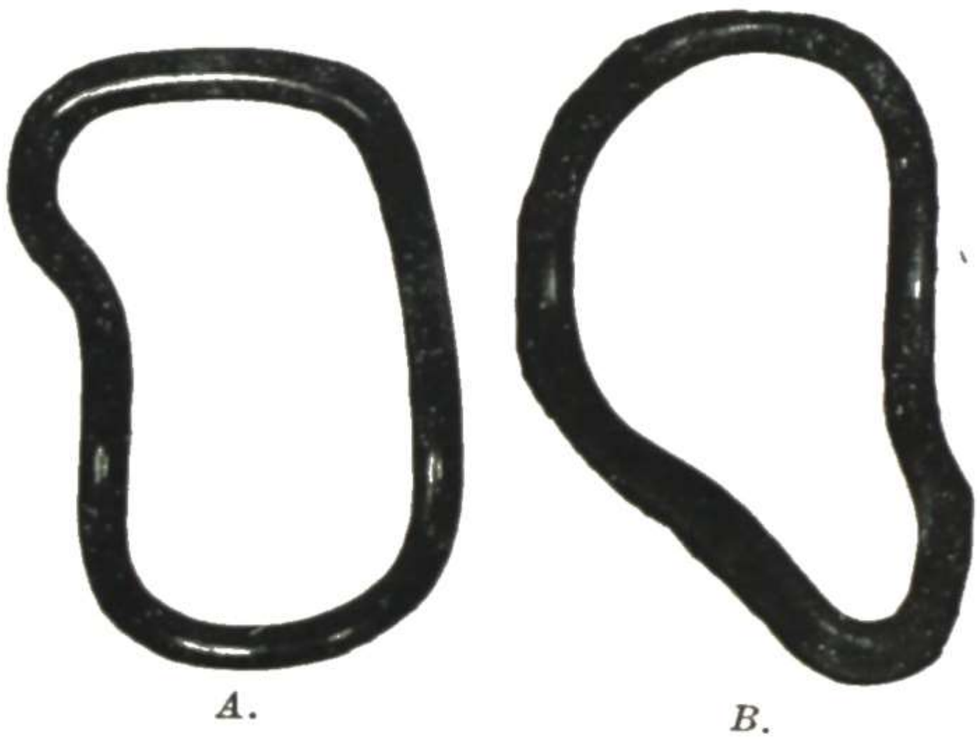


Fig. 569.

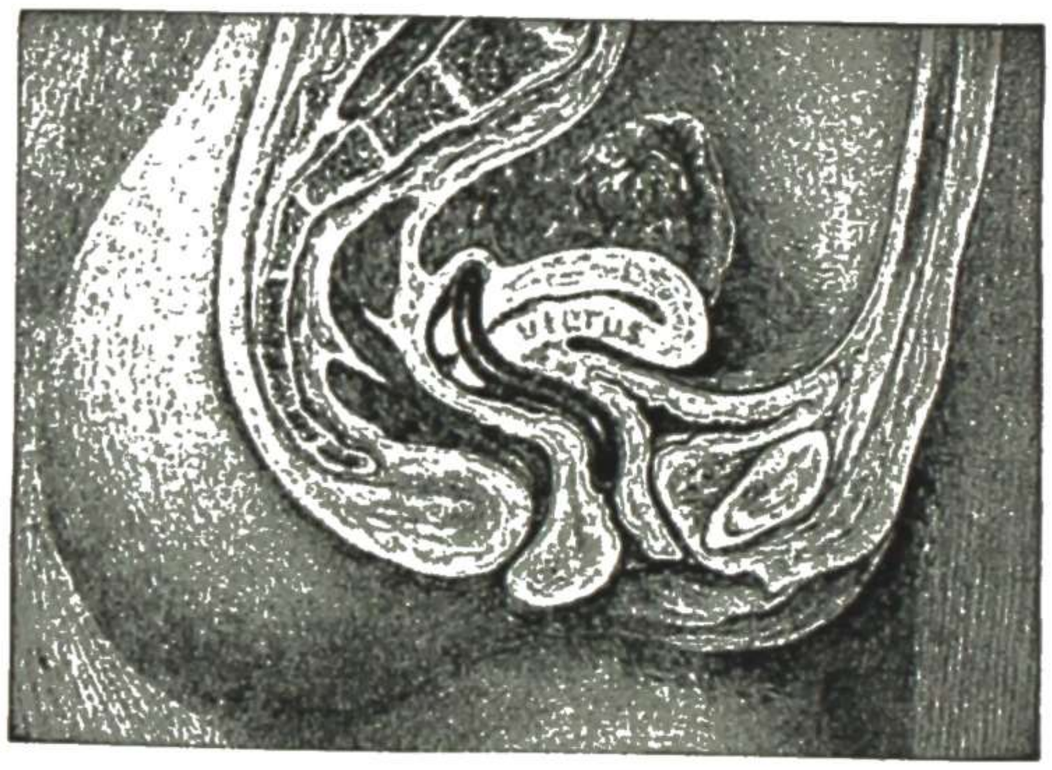


Fig. 570.

Fig. 569.—*A*, The Hodge pessary. *B*, The Albert Smith pessary.

Fig. 570.—The pessary in place. The action of the pessary is to hold the posterior vaginal fornix, and with it the attached cervix, well backward and upward in the pelvis. (Skene—*Diseases of Women.*)

Action of the Pessary

The action of the Hodge pessary and its modifications, as ordinarily used in a case of retrodisplacement, is to **hold the cervix back** in the hollow of the sacrum (Fig. 570). As long as the cervix is held well back in the pelvis, the fundus uteri will stay forward where it belongs. The pessary holds the cervix uteri back in place by holding back the posterior vaginal vault (to which the cervix is closely attached) and also by pushing upward and backward on the sacro-uterine ligaments, thus putting them on the stretch. To accomplish this, the anterior portion of the pessary must have a rather firm support, which it gets from the pubic arch (with intervening soft tissues) and the pelvic floor.

The action of the pessary, with its many curves, seems to be a veritable puzzle to many students and to not a few practitioners, yet it is clear enough when properly approached and studied. The principle of action is the same as though a straight stick extended from the pubic arch to the posterior vaginal vault. As long as the anterior end of the stick is supported by the pubic arch, neither the posterior vaginal fornix nor the cervix, which is closely attached to it, can approach the vaginal outlet. The cervix can move up and down through a small arc, but it cannot come any nearer the vaginal outlet and consequently as the cervix is held well back in the pelvis the fundus uteri stays forward.

This is practically the action of the pessary. It takes its fixed **point of support** from the **pubic arch** (the soft tissues intervening), being held up against the narrow part of the arch by the **pelvic floor.** As long as the anterior end of the pessary is properly supported (held stationary), the posterior end holds the posterior vaginal vault and the attached cervix well back in the pelvis. The ring shape of the pessary and the various curves are simply to adjust it comfortably to the adjacent structures. The open ring permits the cervix to project through the pessary, the sides to lie well out of the way in the lateral angles of the vaginal canal, and the uterine secretion to flow outward without hindrance.

The marked upward bend of the posterior portion of the pessary increases its ability to push the posterior vaginal fornix upward and backward and put the sacro-uterine ligaments on the stretch. The long upward curve of the front part of the pessary with the narrow anterior end permits the anterior end to lie up out of the way in the narrow part of the arch, and also furnishes a slope against which the perineum and front part of the pelvic floor act advantageously, helping to support the pessary in both an upward and backward direction and thus taking some of the pressure off the extreme anterior end.

When the pelvic floor is severely torn, it permits the pessary to sink lower in the pelvis. The anterior narrow end lies at a wide part of the arch, a part too wide to furnish support for it and it slips outside a short distance. This permits the cervix to come forward and then the fundus goes backward. In such a case, if we use a pessary with a wider anterior end (e.g., the regular Hodge pessary) it, being wider, impinges on the sides of the arch and holds the cervix back where it belongs. In very severe laceration, the marked relaxation of the pelvic floor allows the pessary to come so low—to such a very wide part of the arch—that not even the Hodge pessary will stay in. In such a case some temporary relief may be given by other styles of pessary to be mentioned later.

Selection of Pessary

The selection of the pessary best adapted to a particular case concerns the style, size, and special modifications.

As to **style** or form, in retrodisplacement the authors prefer the Smith pessary (Fig. 569, *B*), in all but exceptional cases.

The exceptional cases in which this pessary may not be satisfactory are as follows:

Where there is a severe laceration of the pelvic floor. In these cases a pessary with a wider anterior end is required, as previously explained. Here the regular Hodge pessary is usually the preferable one. In lacerations of extreme severity, where the parts are so relaxed that neither the Hodge nor Smith pessary will stay in, the inflated ring pessary or one of the other forms mentioned under Prolapse may give some temporary relief. For permanent relief in such a case operative measures are required.

When there are painful inflammatory lesions about the uterus or a prolapsed and tender ovary. As a rule, however, in such cases time spent with pessaries is time wasted, as far as any permanent relief is concerned.

As to the **size** of pessary to be selected, the approximate length may be determined by measuring with the examining fingers the distance from the posterior vaginal vault (pushed well up) to the pubic arch. The length of the pessary should be a trifle less than this. The width of the pessary which the vagina will accommodate may be determined approximately by the apparent roominess of the vagina as felt in vaginal palpation.

However, the size of pessary that will keep the uterus in position with the least discomfort can be determined certainly only by trial, and several pessaries may have to be worn for a short time before the most satisfactory one for that particular case is settled upon. A pessary that is too small fails to hold the uterus in position and tends to slip out. A pessary that is too large causes pain.

The **special modifications** refer to slight changes in shape from the regular form, occasionally required to make the pessary more comfortable or more satisfactory in retaining the uterus in position.

1. General narrowing of the pessary. The pessaries as purchased maintain a ratio between the width and the length (the longer the pessary the wider it is). As a rule this is desirable. In some cases, however, the vaginal opening is too small to admit a pessary of sufficient length. To overcome this difficulty, drop the pessary in boiling water (e.g., in the instrument sterilizer) until it becomes slightly pliable, then remove it with a forceps, grasp it with a towel, and squeeze it so as to narrow it laterally to the required extent, and hold it thus until it cools, the cooling being hastened by allowing cold water to run over it. Do not keep it very long in the hot water or it will become so pliable that it flattens into a simple ring, which is not desirable unless a very extensive reshaping is required.

The Findley folding pessary is a hard-rubber pessary of the Smith form which has a soft-rubber insertion at each end, thus permitting the pessary to be narrowed or folded for introduction by simple squeezing as it is introduced, the pessary returning to its original shape when inside. It is convenient when a patient with a small vaginal opening requires a long pessary. Experience with flexible rubber pessaries, however, would indicate eventual hardening and cracking of the flexible ends.

2. Local Bending. When softened in boiling water, the hard-rubber pessary may be modified in shape in various ways to adjust it to special conditions, such as a tender spot to be avoided or a condition requiring increase or diminution of the longitudinal curves.

Pessary Used Only After Replacement

The pessary is ordinarily not used until the uterus has been brought forward. The pessary is not, as many suppose, used to push the fundus uteri forward, neither is it used to prop the fundus forward. The pessary has nothing to do directly with this part of the uterus. All the pessary does is to hold the cervix well back in the pelvis, as previously explained, and then in the ordinary state of affairs the fundus must stay forward.

There are **some exceptions** to the rule that a pessary is used only after replacement. In some cases of roomy pelvis, in which it is difficult to raise a movable fundus uteri because it gets out of reach, a pessary may be used somewhat as an extension to the finger, to help raise the fundus within reach of the abdominal fingers.

Again, in a case of movable uterus which cannot be brought forward satisfactorily, if a pessary is introduced and the patient instructed to take the knee-chest posture twice daily, the uterus may be found forward at the next examination a few days later.

Introduction of the Pessary

Ordinarily the pessary is introduced with the patient in the dorsal posture, immediately after the uterus has been brought forward by bimanual reposition, as already described.

Before introducing a pessary, cleanse it thoroughly in an antiseptic solution and then lubricate it with a suitable ointment. In introducing it into the vaginal opening, if the opening seems rather small, put one finger in the vagina and depress the perineum strongly to make room for the pessary. Remember, in introducing a pessary or speculum or the examining fingers into the vagina, if the opening seems small and more room is desired, the pressure must always be made backward, depressing the perineum. The least pressure forward will pinch the tissues against the pubic arch.

The introduction or placing of the pessary is carried out as follows: Hold the pessary by the anterior end, depress the perineum well with one finger (Fig. 571) and introduce the posterior end with the breadth of the pessary lying in the anteroposterior diameter, which is the largest diameter of the opening. The pessary should be held somewhat obliquely so as not to make painful pressure on the urethra (Fig. 572). When the pessary is about halfway in (Fig. 573), turn it so that the breadth of the pessary lies laterally (Fig. 574), and the posterior arm is directed upward. Then push the pessary along until it will not go any farther. It stops because the posterior end is against the anterior lip of the cervix. Then introduce a finger into the vagina beneath the pessary, catch the posterior bar with the finger tip (Fig. 575), depress it (Fig. 576) and then push the pessary past the cervix. Fig. 570 shows the pessary in place.

After the pessary is in place it is well to have the patient walk about the room a little, to see whether there is any discomfort. If there is any decided pain or marked discomfort, try a smaller size or another form.

Instructions to Patient With Pessary

The care of a patient having a pessary in place includes the following points:

Visits to the Physician.—When the pessary is introduced the patient is directed to return in a week, or before if there is any pain. There is more or less uncertainty for the first week or so, as to just how the pelvic structures will accommodate themselves to a pessary. For that reason it is well to in-

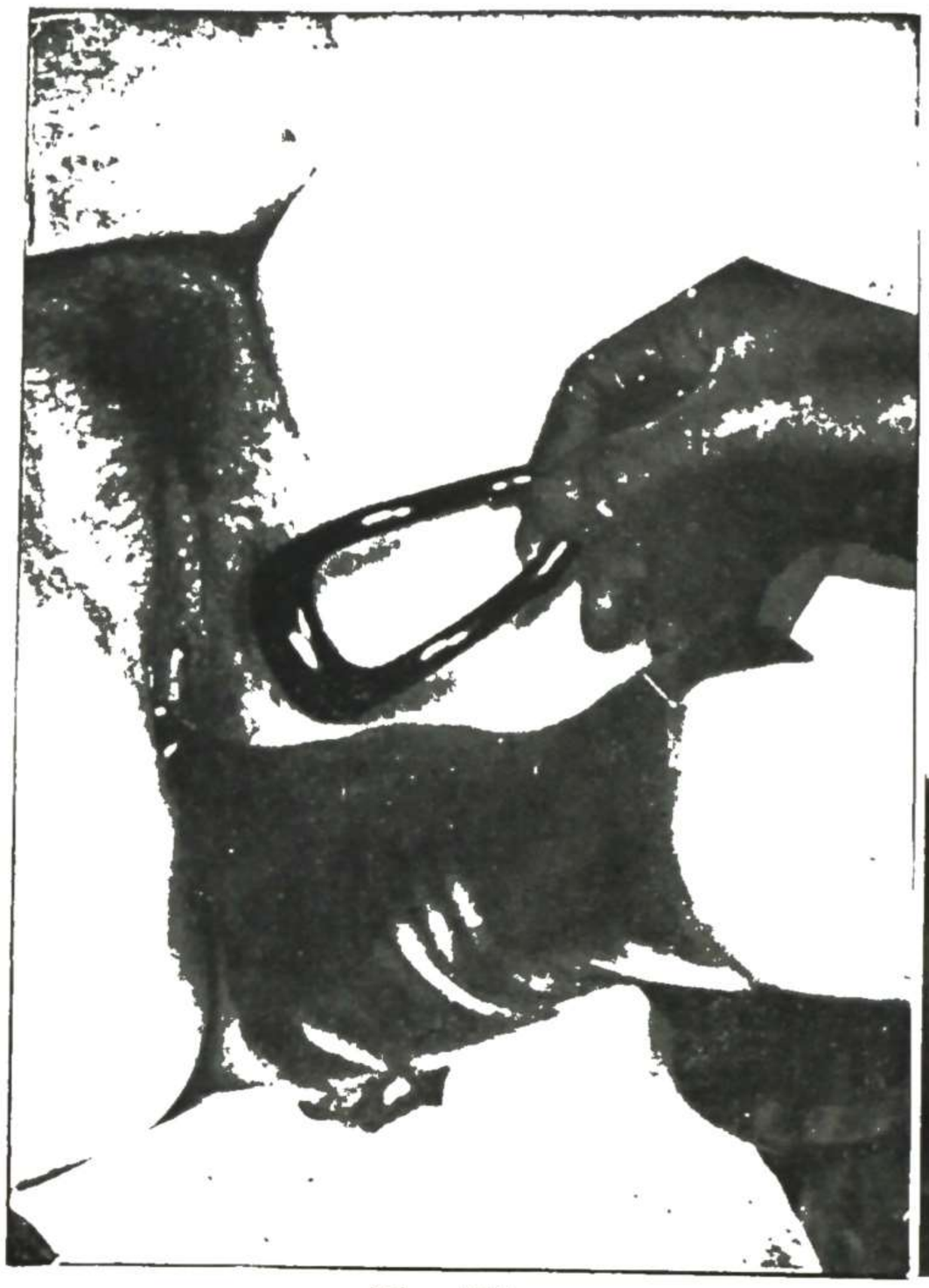


Fig. 571.

Fig. 572.

Fig. 571.—Introducing the pessary. First step—depressing the perineum.

Fig. 572.—Introducing the pessary through the vaginal opening. The width of the pessary lies in the anteroposterior diameter of the opening, which is the long diameter, but is turned somewhat obliquely to avoid the urethra.

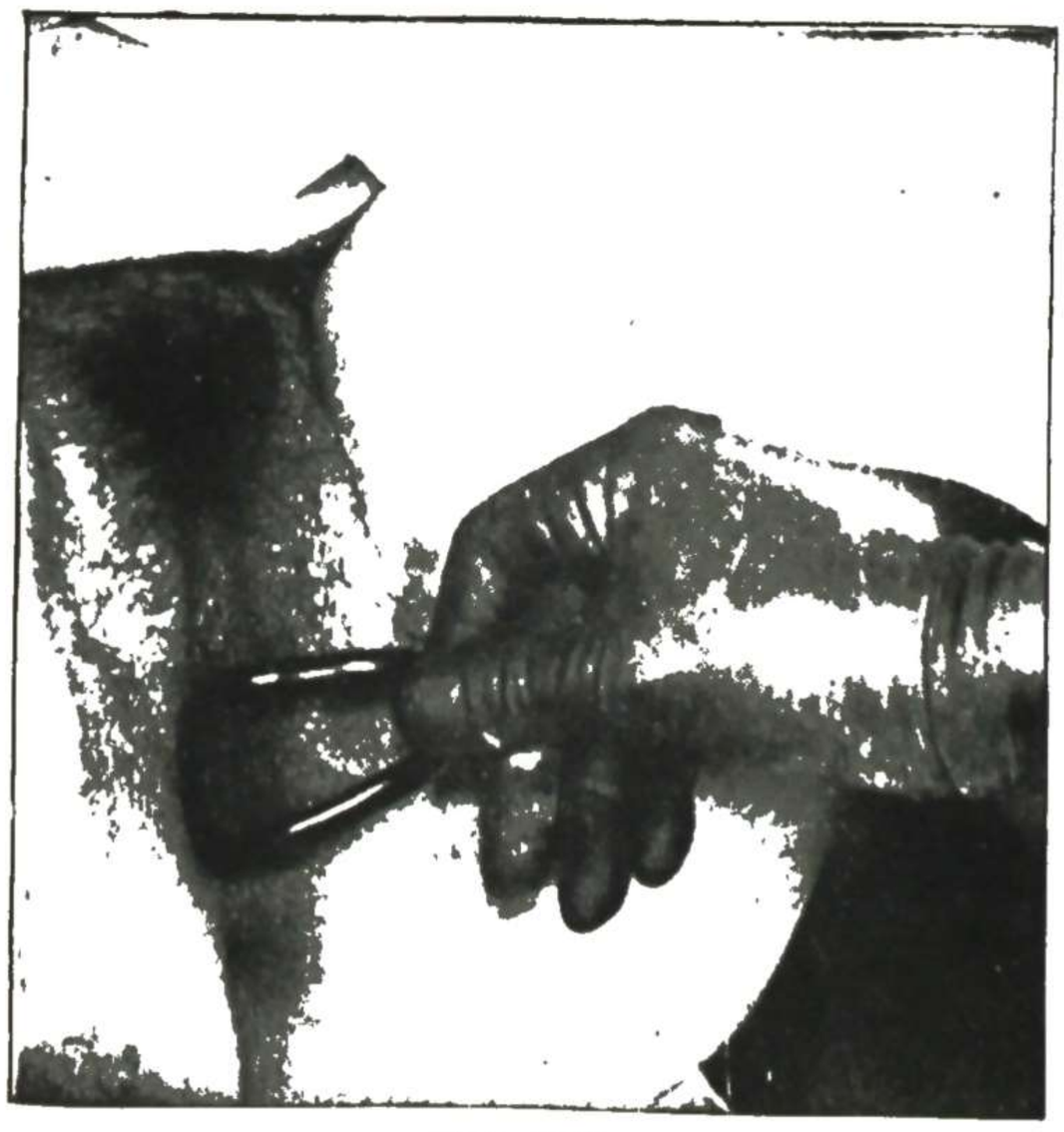


Fig. 573.

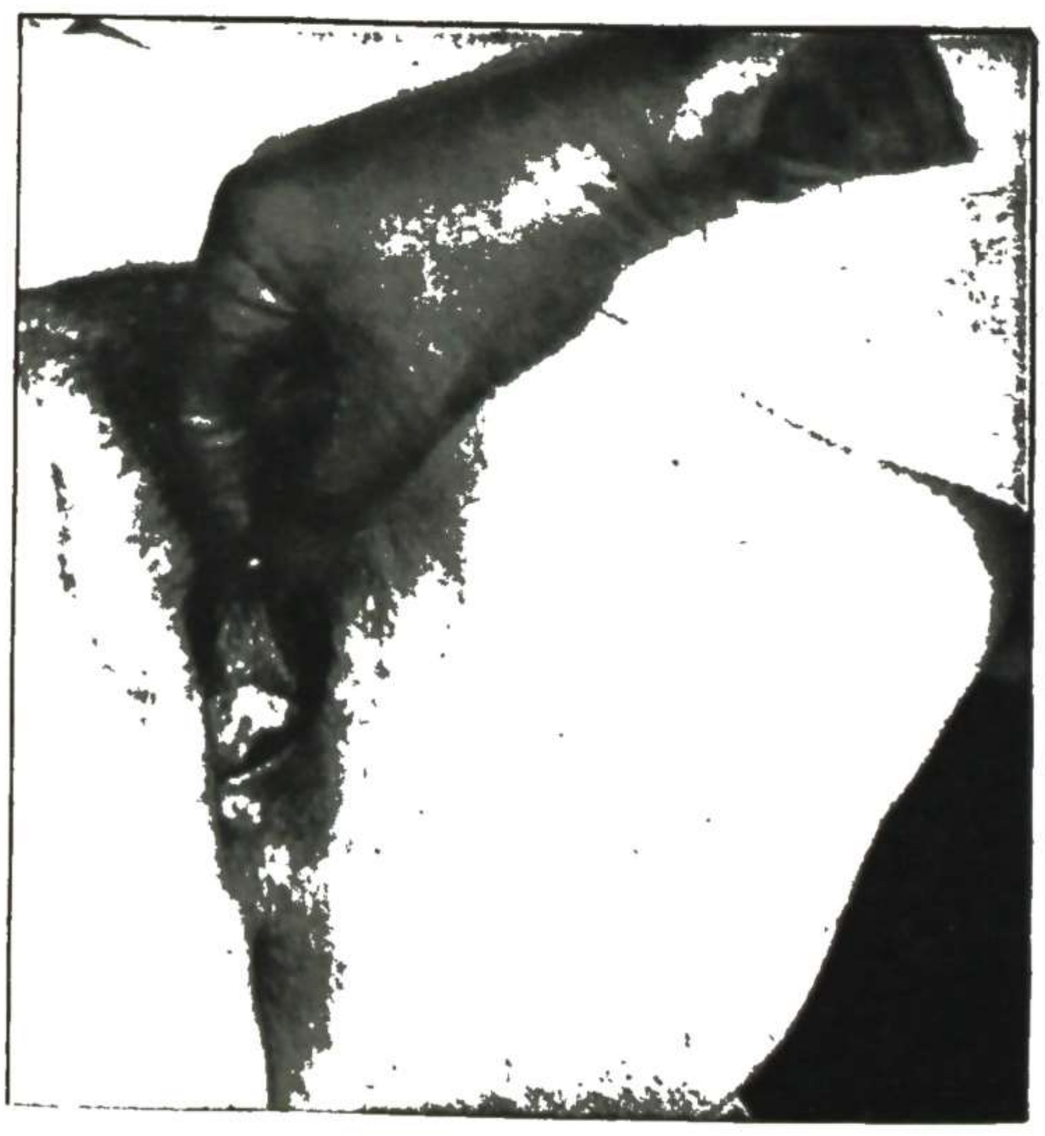


Fig. 574.

Fig. 573.—Introducing the pessary. The pessary is turned so the width lies transversely, for the transverse diameter is the long diameter of the vaginal canal, though not of the vaginal entrance. The pessary is then pushed in until its further progress is stopped by the cervix.

Fig. 574.—Introducing the pessary. The pessary is now well within the vagina and ready for turning.

struct the patient to return at once if any unusual pain is felt or if the pessary appears to slip out of position.

When the pessary is found satisfactory at the second and third visits, it is to be assumed that it will prove satisfactory right along, and as long as the patient feels well she need not return, except every month or six weeks as conditions indicate. This return at regular intervals of a few weeks is important in every case (though, exceptionally the intervals may be longer) for three reasons—(a) because the pessary is liable to accumulate concretions that may prove irritating, (b) because long-continued pressure may produce irritation at some point in the posterior vaginal fornix, and (c) because it is important to know whether the pessary is doing the work it is used for, and whether everything is going as it should. Injurious pressure on the wall is indicated by a distinct groove or ridge with infiltration in the affected area. When such is present, the pessary should be left out for a few weeks or a different form used. If necessary to leave the pessary out for a time, the knee-chest posture night and morning is to be employed.

Fig. 575.

Fig. 576.

Fig. 575.—Introducing the pessary. The index finger is passed to the top of the posterior end, which is then depressed until it can be pushed past the cervix, as shown in Fig. 576.

Fig. 576.—Introducing the pessary. The posterior end depressed and being pushed past the cervix. The pessary is shown in place in Fig. 570.

Douches.—The patient wearing a pessary should take a vaginal douche every day or every few days. If the discharge is very free, it may be advisable to take two douches daily. If there is practically no discharge, two douches weekly may be sufficient. Ordinarily the patient is directed to take a douche once daily or every other day.

Knee-Chest Posture.—The knee-chest posture (Fig. 329), taken by the patient night and morning, is very useful in those cases in which the uterus tends to return to its old position or in which the patient complains of downward pressure in the pelvis. It causes the patient some inconvenience and is not necessary when the pessary holds the uterus well up and entirely relieves the symptoms. But in many cases of damaged pelvic floor, its use along with the pessary is very advantageous.

The **activity of the patient** need not be curtailed on account of the pessary. The pessary is meant to hold the uterus in proper position and restore the patient to comparative health, so that she can pursue her usual activities without disturbance. If the patient cannot pursue her usual activities after the pessary has been worn a month or two, the pessary has failed of its purpose, and some more effective method of treatment is indicated.

In some cases, the replacement of the uterus and wearing of the pessary are carried out principally to increase the chance of pregnancy, and in such cases coitus is permissible from the first. It is well to mention this fact to the patient or her husband, as otherwise it may be thought that coitus is not possible while the pessary is in place.

If pregnancy should develop, the pessary should be worn just the same until the uterus has become large enough to prevent its sinking back into the pelvis. The douche should then be taken only warm—not hot, for a hot douche may excite uterine contractions and lead to miscarriage. Usually along in the third or fourth month the pessary is taken out, as it is of no further use, and if left in longer it might cause irritation and disturbance.

Occasionally a pessary excites pain shortly after pregnancy takes place. If so, it should be removed, the patient being directed to take the knee-chest posture two or three times daily, to keep the fundus uteri forward.

When to Discard the Pessary

The time at which the pessary may be discarded varies much in different cases, and in each case is more or less a matter of trial. A very good rule is to leave out the pessary after the uterus has remained in position continuously for six months. Direct the patient to return in a few days. If the uterus has returned to its old backward position, replace it and use the pessary again for several months.

If the uterus maintains its forward position without the pessary, direct the patient to return again in two weeks. If then the uterus is in proper position and the patient is feeling well, she may be discharged, being directed to return if symptoms should at any time reappear.

The Inflated Ring Pessary.—The action of the inflated ring pessary is principally to raise the uterus and adjacent tissues somewhat and to support them. It has no particular action in holding the cervix well back in the pelvis nor in maintaining the uterus in a proper forward position. Consequently, the field of usefulness of this particular form of pessary is in those cases in which the uterus cannot be got into the forward position or cannot be maintained there. The simple supporting of the uterus, thus overcoming the slight prolapse which is present in most cases of retrodisplacement, often gives the patient much relief, though the retrodisplacement has not been corrected.

Persistence of Symptoms

The effect just noted of the simple support of the uterus serves to show the importance of the slight PROLAPSE in these cases and serves to show also that the retrodisplacement, as a factor in the causation of the symptoms and as a factor to be considered in the treatment, is not of such exclusive impor-

tance as one might infer. The relief that follows operative replacement and permanent correction of the retrodisplacement is due, to a large extent, to the simultaneous elevation of the uterus and adnexa.

When there are troublesome symptoms that are not relieved by the measures previously mentioned, operative treatment is required. The various classes of operative measures are mentioned further along.

In order that the operative treatment may prove satisfactory, the patient should be put through a most careful and thorough pelvic examination, that the exact cause of the persistence of the displacement may be accurately determined, and the form of operative treatment selected accordingly.

In a large proportion of the patients who have borne children, there will be found a relaxed condition of the pelvic floor and of the broad ligaments and sacro-uterine ligaments. It is evident that in such a case the simple bringing of the fundus uteri forward and fastening it there is only a small part of the necessary work. The pelvic floor must be strengthened, and some means must also be used to lift up the uterus and thus overcome the prolapse due to the relaxation of all the supports of the organ. In many of these cases the uterus is large and heavy from subinvolution or other pathologic process.

WHEN THE UTERUS IS ADHERENT

When the fundus uteri cannot be brought forward by the methods previously described and no tumor that is responsible for the fixation can be felt, it is assumed that the uterus is "adherent," i.e., held in its abnormal position by the products of pelvic inflammation, affecting the tube or the peritoneum or the connective tissue. The fixation may be so close that the fundus cannot be moved appreciably, or it may, on the other hand, permit considerable movement in various directions, but not enough to allow the fundus uteri to be brought entirely forward.

For the purposes of treatment it is convenient to divide these cases of adherent retrodisplacement into two classes—(1) those in which the inflammation is acute or subacute, and (2) those in which it is chronic or has practically disappeared, leaving only the sequelae.

Inflammation Acute.—These cases present, in addition to the retrodisplacement of the uterus, the usual symptoms and signs of acute or subacute pelvic inflammation. The symptoms presented by the patient are due principally to the inflammation, and the treatment is at first directed wholly to that.

When the inflammation subsides, the troublesome symptoms may disappear to such an extent that no treatment for the retrodisplacement is required. It is the relief of pain and discomfort that the patient seeks and when this can be secured simply by the relief of the inflammatory trouble, it is not necessary to disturb the uterus. In fact, as a rule, anything in that direction short of removal of the inflammatory focus will tend to stir up again the troublesome symptoms.

Operation is required, however, in a majority of these cases sooner or later, either because of a persisting focus of inflammation, with chronic invalidism, or because of the sinking and dragging of the heavy retrodisplaced uterus on the damaged and sensitive adnexa or adjacent structures. In the

case of a partially movable uterus, the wearing of a pessary (for example, the inflated ring pessary) that holds the heavy uterus up, will sometimes give considerable relief. Such a pessary prevents the constant dragging of the uterus on its supports and on the sensitive adnexa, and in that way gives relief, though there is no correction of the retrodisplacement.

Chronic Inflammation.—In the chronic cases, fixation of the retrodisplaced uterus is usually due to inflammation beginning in a fallopian tube; consequently it is frequently accompanied by salpingitis and an inflammatory exudate involving one or both tubal regions. There may be a collection of pus in a tube or in the mass of exudate about the tube, or there may be only a mass of inflammatory exudate without pus, or there may be only adhesions. If the previous inflammation was in the connective tissue, there will be infiltration remaining from the pelvic cellulitis (parametritis). In either case, the uterus is found in an abnormal position and cannot be replaced by the methods previously described.

In these cases, considerable relief may be given by measures that tend to allay the accompanying pelvic inflammation and that stretch the adhesions and that support the uterus to some extent. However, such complications giving active trouble usually require operation.

In cases with only old adhesions holding the uterus, manual stretching of the adhesions by repeated slow pressure to raise the fundus may eventually be effective in replacement. When a more evenly distributed gradual pressure is advisable, as in cases of pregnancy with retrodisplacement, a long bag containing mercury may be used with the knee-chest posture. The empty end of the bag is slipped into the vaginal vault and then the mercury allowed to fill it, the pressure to be maintained over a considerable period depending on conditions and the patient's reaction.

Operative Treatment

The objects of the operative treatment are two: first, the removal of products of inflammation and of damaged organs as far as necessary and, second, the lifting and bringing forward of the body of the uterus and fastening it. This requires major operative work.

Fig. 4 shows the course of the round ligaments, the shortening of which in various ways constitutes the usual special step in retrodisplacement operations. At first the shortening of the ligaments was carried out extraperitoneally by opening the inguinal canal on each side, the first successful operation being performed by Alexander of Liverpool in 1881.

Later, when the advances in antiseptic and aseptic technique reduced the high mortality of intraperitoneal work, the ligament shortening was carried out by intraperitoneal operation. This enabled coincident surgical treatment of the associated inflammatory lesions which rendered so many retrodisplacement cases not amenable to extraperitoneal shortening.

The type of retrodisplacement due to imperfect development of the uterus from the infantile position may not cause any trouble requiring treatment. But if there should be associated symptoms and correction be attempted, permanent correction is likely to be found difficult because of the general tissue

fixation and the poor development of the structures used to maintain correction. In these cases, endocrine treatment to promote further development is indicated in addition to any mechanical means employed.

PROLAPSE OF THE UTERUS

Prolapse of the uterus is that condition in which the uterus sinks decidedly below its normal level in the pelvis and appears at or near the vaginal opening. It is known also as "procidentia," and is frequently referred to by patients as "falling of the womb."

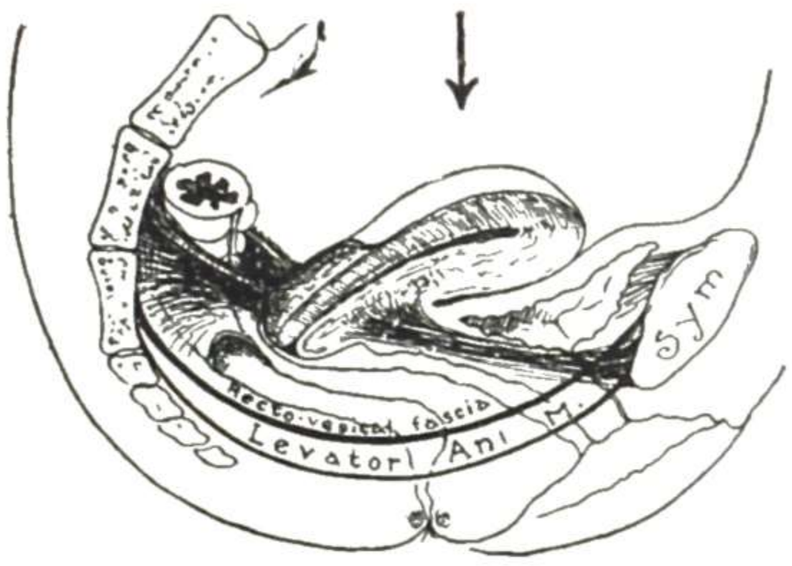


Fig. 577.

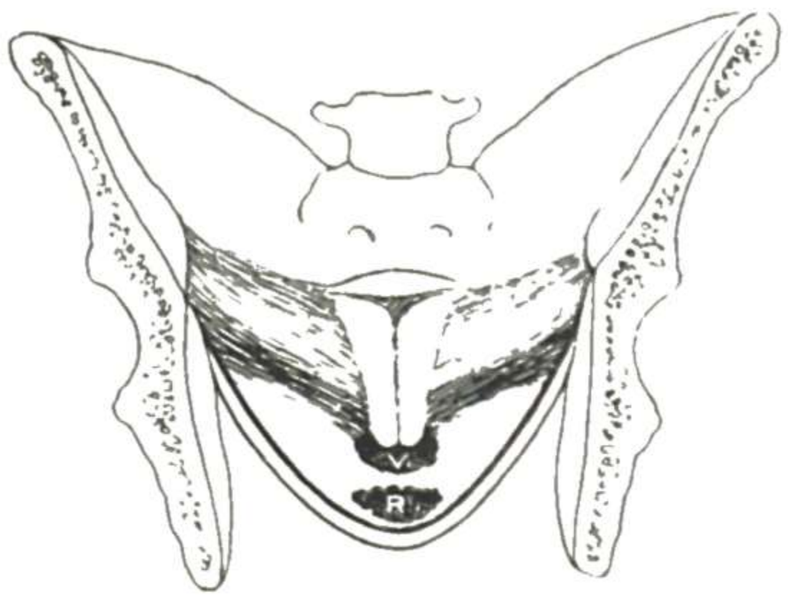


Fig. 578.

Fig. 577.—The upper diaphragm and the lower diaphragm of the pelvis, showing the sling action anteroposteriorly. In the upper diaphragm, the anteroposterior sling is formed by the uterosacral ligaments posteriorly and the uteropubic fascial plane anteriorly. In the lower diaphragm, the anteroposterior sling, indicated here diagrammatically, is formed by the levator ani muscles and surrounding fasciae, with supplementary muscles in front and behind.

This illustration indicates also the deflecting action of the corpus uteri, which receives the intraabdominal pressure upon its posterior surface and distributes it toward the margins of the supporting diaphragm.

Fig. 578.—The upper diaphragm and the lower diaphragm of the pelvis, showing the sling action transversely. In the upper diaphragm the transverse sling is formed by the broad ligaments, and particularly by the strong supporting structures forming the lower portion of the broad ligaments. In the lower diaphragm, the transverse sling is formed by the levator ani muscles and surrounding fasciae, shown here diagrammatically. (Crossen and Crossen—*Operative Gynecology.*)

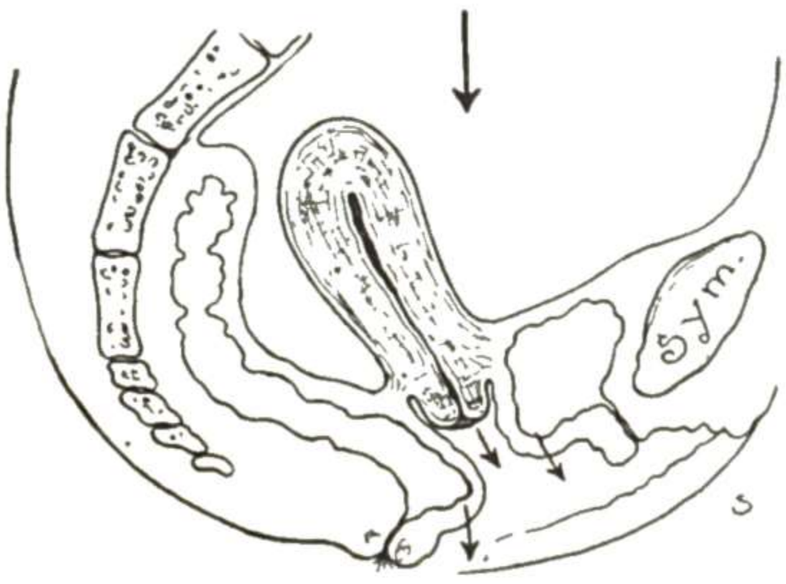


Fig. 579.

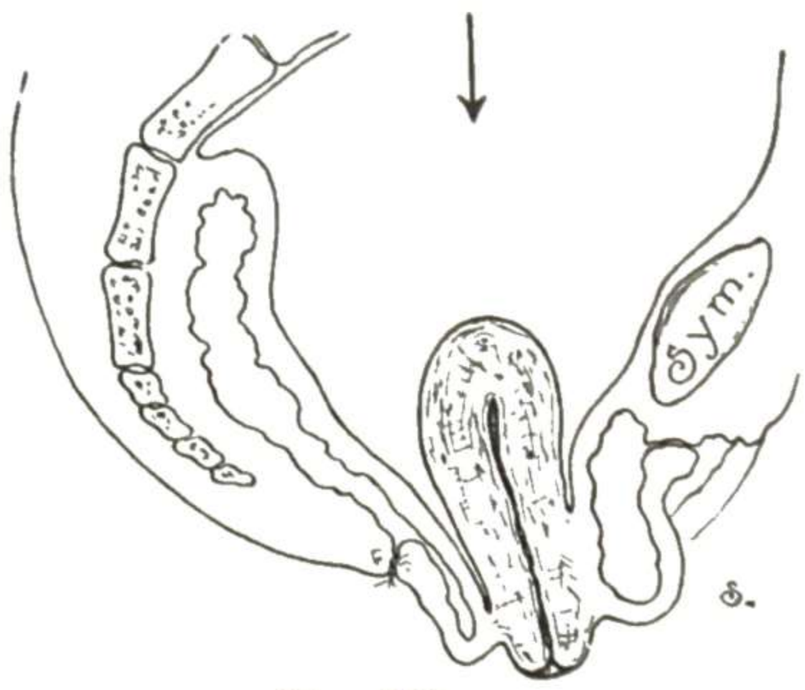


Fig. 580.

Fig. 579.—Disarrangement of the deflecting mechanism by retrodisplacement of the corpus uteri, accompanied by relaxation of the pelvic floor. In the presence of such conditions, the development of prolapse is ordinarily only a question of time, for there is no adequate resistance to intra-abdominal pressure.

Fig. 580.—Prolapse of uterus and bladder developed. The intra-abdominal pressure tends to push the structures farther and farther out of the pelvis. (Crossen and Crossen—*Operative Gynecology.*)

Etiology

The largest factor in the origin of uterine prolapse is the **great stretching** of the birth canal and adjacent tissues incidental to the passage of the child in parturition. The component structures of the pelvic floor have already been described and illustrated, and the supravaginal supporting diaphragm of

muscular and fibrous structures is shown in Figs. 577 and 578. Subinvolution of these stretched tissues is an important item in their remaining loose and nonsupportive. Open tears may contribute some, but not much when repaired at the time.

Retrodisplacement of the uterus is another factor contributing to prolapse. Retrodisplacement disarranges the positional combination which is an important aid in the supporting mechanism. When the uterus is forward in normal position, intra-abdominal pressure tends to push it forward more and to strengthen the support, as indicated in Fig. 577. When the uterus is in retrodisplacement, its axis is directed toward the pelvic outlet, and the intra-abdominal pressure tends to push it down in that direction, as shown in Fig. 579. The continuance of this downward pressure, day by day, gradually

Fig. 581.

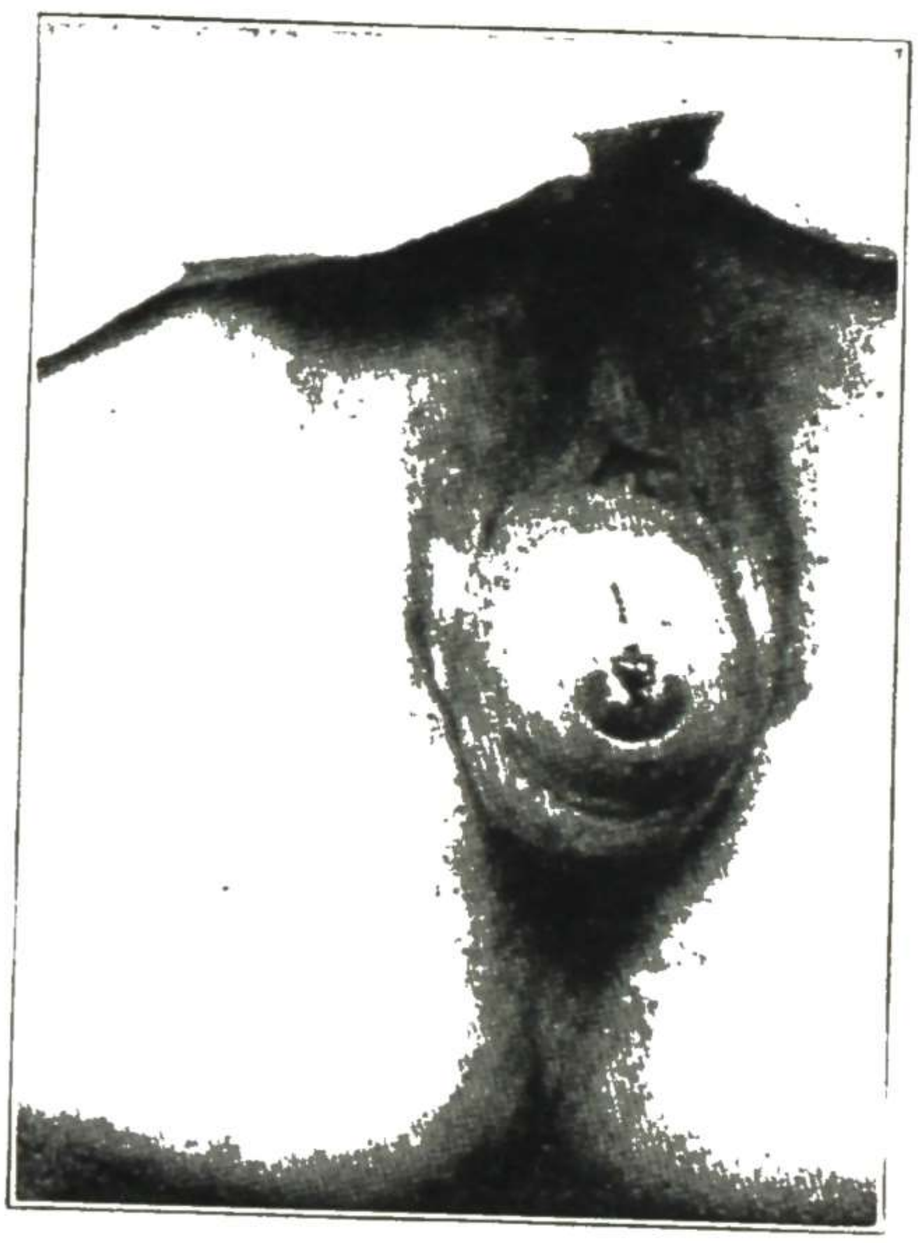


Fig. 582.

Fig. 581.—Prolapse of the uterus in a nullipara. (Hirst—*Diseases of Women.*)
Fig. 582.—Prolapse of the uterus in a virgin. (Küstner—*Kurzes Lehrbuch der Gynakologie.*)

stretches the supports, and the uterus and attached structures are pushed lower and lower, as shown in Fig. 580. Retrodisplacement not only disarranges the normal positional combination support but also places the uterus with the small end directed toward the outlet so that it becomes a wedge which will gradually dilate the lower part of the birth canal, even though it may have been repaired.

Prevention of prolapse consists of (a) repairing tears at delivery, (b) aiding normal involution by every means, and (c) correcting retrodisplacement if present.

A special type of case due to childbirth damage is that in which the prolapse comes on after the menopause, long past the time when trouble from birth injury is expected. This paradoxical happening is explained by the fact that after the menopause the atrophy of muscular tissue may so interfere with

the normal tone and fullness as to lead to the development of prolapse at that late age, the previous relaxation of the pelvic floor not having been sufficient in itself to cause it.

A third factor which appears in the origin of prolapse in some cases is **imperfect development** of the pelvic structures. In infancy the uterus extends upward in the direction of the vaginal axis and with the cervix in line. As development continues, the whole uterus comes forward, with the corpus more so. When development is imperfect, the infantile position may persist. As a cause of prolapse there are two items in this developmental defect. One is the retrodisplacement of the uterus, favoring prolapse as explained above, and the other is the tissue weakness characteristic of poorly developed structures. Lacking the tone and supporting strength of well-developed tissues, they gradually give way under the stress of adult activity and permit the uterus to prolapse. Remembering these facts, one will not be so astonished at encountering uterine prolapse in the nullipara (Fig. 581) or even in the virgin (Fig. 582). A point to be kept in mind in handling this type of case is that the pelvic tissues lack the normal strength and resistance, and when repaired in the usual way are very likely to stretch again with return of the prolapse. Consequently, care should be taken to employ measures which will give extra guard against recurrence.

Another point is that this defect may be associated with more extensive defective development, including spina bifida occulta. Laws has called attention to the role, often overlooked, of occult spina bifida and its accompanying weaknesses as a factor in bladder dysfunctions, uterine prolapse in nullipara, sphincter weakness, and regional nerve disturbances. He states that "the symptoms may be absent till adult life and then be considered as due entirely to injuries of childbirth," and again, "the vaginal plastic surgeon should think of occult spina bifida in terms of innervation of the skin, muscles, and connective tissue of the pelvic floor."

Pathology

In considering prolapse, it must be kept in mind that the uterus normally has considerable up and down movement. Respiration causes movement of the uterus, which is noticeable during the speculum examination, especially with the patient in the Sims posture.

There may be considerable exaggeration of the usual downward displacement without any symptoms, and that could hardly be called pathologic. The condition is not called prolapse unless there is marked downward displacement, and this is almost always accompanied with backward displacement of the uterus.

Prolapse is a progressive process, as indicated in Fig. 583. If the cervix is just appearing at the vaginal orifice, the condition is designated as prolapse of the FIRST DEGREE (Fig. 584). If the cervix protrudes from the vaginal orifice a considerable distance but not more than half of the uterus is outside, it is called the SECOND DEGREE (Fig. 585). If the larger part of the uterus lies outside the pelvis, it is called the THIRD DEGREE, or complete prolapse (Fig. 586).

In the usual case of prolapse, the uterus is found retrodisplaced and low in the pelvis, the pelvic floor is found lacerated and there is present more or

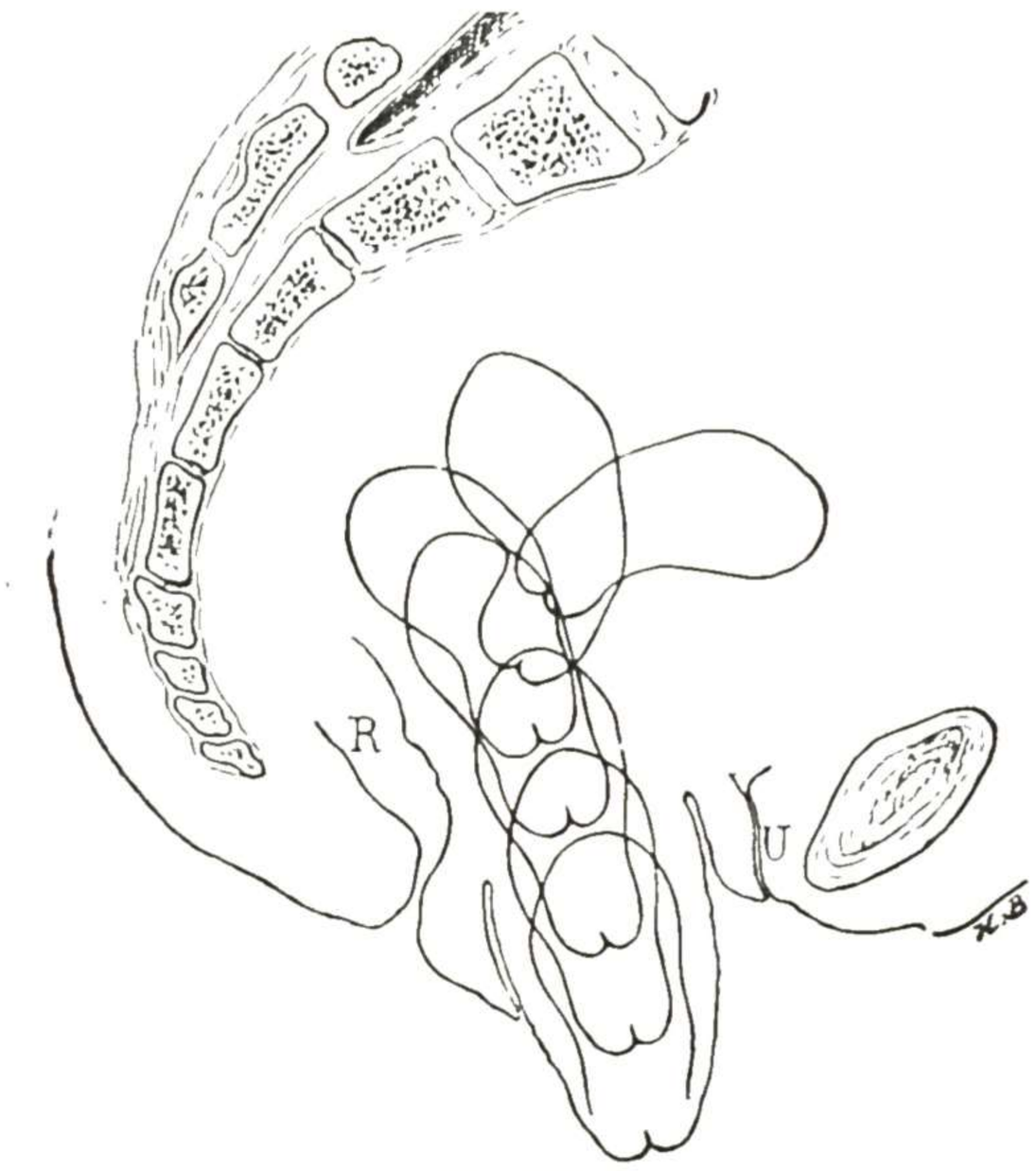


Fig. 583.

Fig. 584.

Fig. 583.—Prolapse of the uterus, showing the various steps in the process. (Kelly—*Operative Gynecology.*)

Fig. 584.—Prolapse of uterus—first degree, the cervix coming to the vaginal outlet. (Hirst—*Diseases of Women.*)

Fig. 585.

Fig. 482.

Fig. 585.—Prolapse of uterus—second degree, the uterus coming a considerable distance outside the body.

Fig. 586.—Prolapse of uterus—third degree, the entire uterus lying outside. (Hirst—*Diseases of Women.*)

less endometritis with discharge. The vaginal walls also are relaxed and thrown into folds by the position of the uterus, and may be found projecting outward at the vaginal opening, forming an anterior or posterior colpocele.

The projecting vaginal wall precedes the cervix on its downward journey. If the bladder follows the projecting vaginal wall, as it frequently does in severe prolapse, the condition is known as cystocele. In some cases of severe prolapse, the anterior rectal wall follows the projecting posterior vaginal wall, forming rectocele.

The cervix in many cases has been severely lacerated and is chronically inflamed and is the seat of cystic disease and of irritating discharge. In severe prolapse, ulcers often appear on the cervix or vaginal walls, being due to irritation of the clothing and to interference with the circulation of the prolapsed portion. The interference with the circulation may be due to two factors—constriction of the prolapsed portion by the vaginal opening and stretching of the uterine blood vessels with consequent diminution in their caliber. All the ligaments of the uterus are stretched until they give practically no support, and the lower pelvis is occupied by the intestines instead of by the pelvic organs, which are prolapsed outside. Sometimes coils of intestines may lie in the cul-de-sac behind the uterus, outside the vaginal opening.

Symptoms

The symptoms of prolapse of the uterus are dragging pains in the back and pelvis, worse when walking, some protrusion at the vulva, and sometimes difficulty in urinating. In some cases the protruding bladder must be pushed back into the pelvis before the patient can urinate. Even then there is more or less residual urine which is likely to lead to cystitis. Some patients complain of partial incontinence of urine when coughing or laughing. In exceptional cases, it is this partial incontinence that brings the patient to a physician, and he must recognize the cause or he will fail in the treatment.

Examination reveals as follows in the different degrees of prolapse:

First Degree.—The pelvic floor is relaxed and there is more or less protrusion of the vaginal walls. The uterus is usually retroverted and the cervix is low in the pelvis and far forward, near or at the vaginal opening (Fig. 584). Coughing or straining causes the cervix to sink lower and the vaginal walls to protrude more.

If there is still doubt as to whether the uterus sinks low enough to be called prolapse or to cause symptoms, the patient may be examined in the standing posture, but this is rarely necessary.

Second Degree.—The cervix is found protruding at the vulva and may be made to protrude more by bearing down (Fig. 585). There is also protrusion of the vaginal walls and sometimes of the bladder. Rectoabdominal examination (Fig. 587) shows the fundus uteri low in the pelvis.

The cervix and vaginal walls may return into the pelvis when the patient is lying down. There is more or less erosion about the cervix and sometimes ulceration.

Third Degree.—There is a mass nearly as large as the fist protruding from the vulva and lying between the thighs (Fig. 586). It is covered by

the turned-out vaginal wall which, from friction of the clothing, has become dry and hard, resembling ordinary epidermis. At the lower part of the mass is the cervix, which is represented by a hard nodule with an opening in the center and more or less erosion or ulceration about it. The appearance of the cervix depends upon how much laceration of the cervix there has been.

Grasping the mass and palpating it to determine its contents, there is found a hard elongated mass—extending upward from the cervix. Usually the size and shape of the uterus can be accurately made out. From the cervix there is more or less discharge which may be clear and glairy, resembling the white of an egg, or it may be mucopurulent.

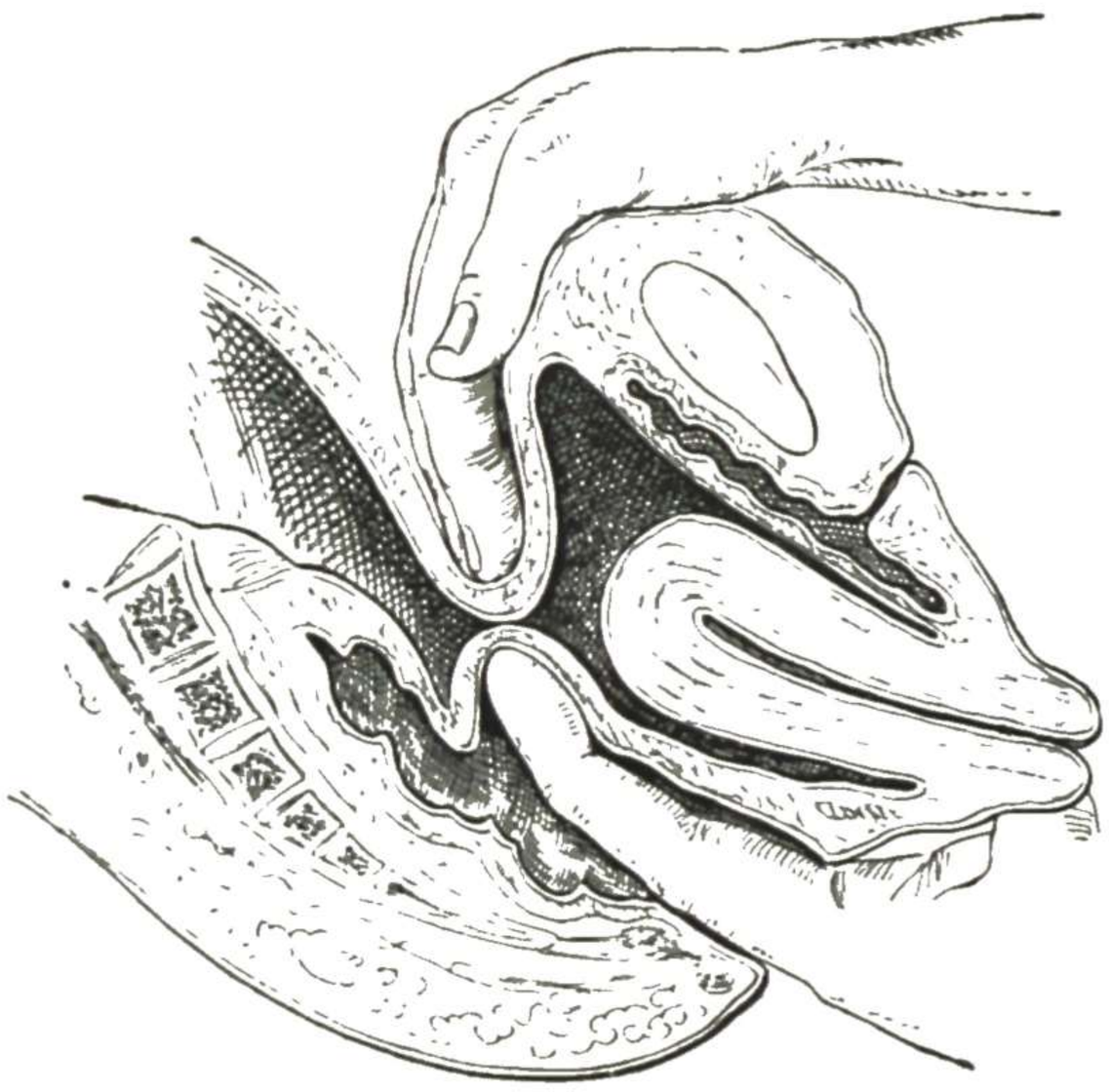


Fig. 587.

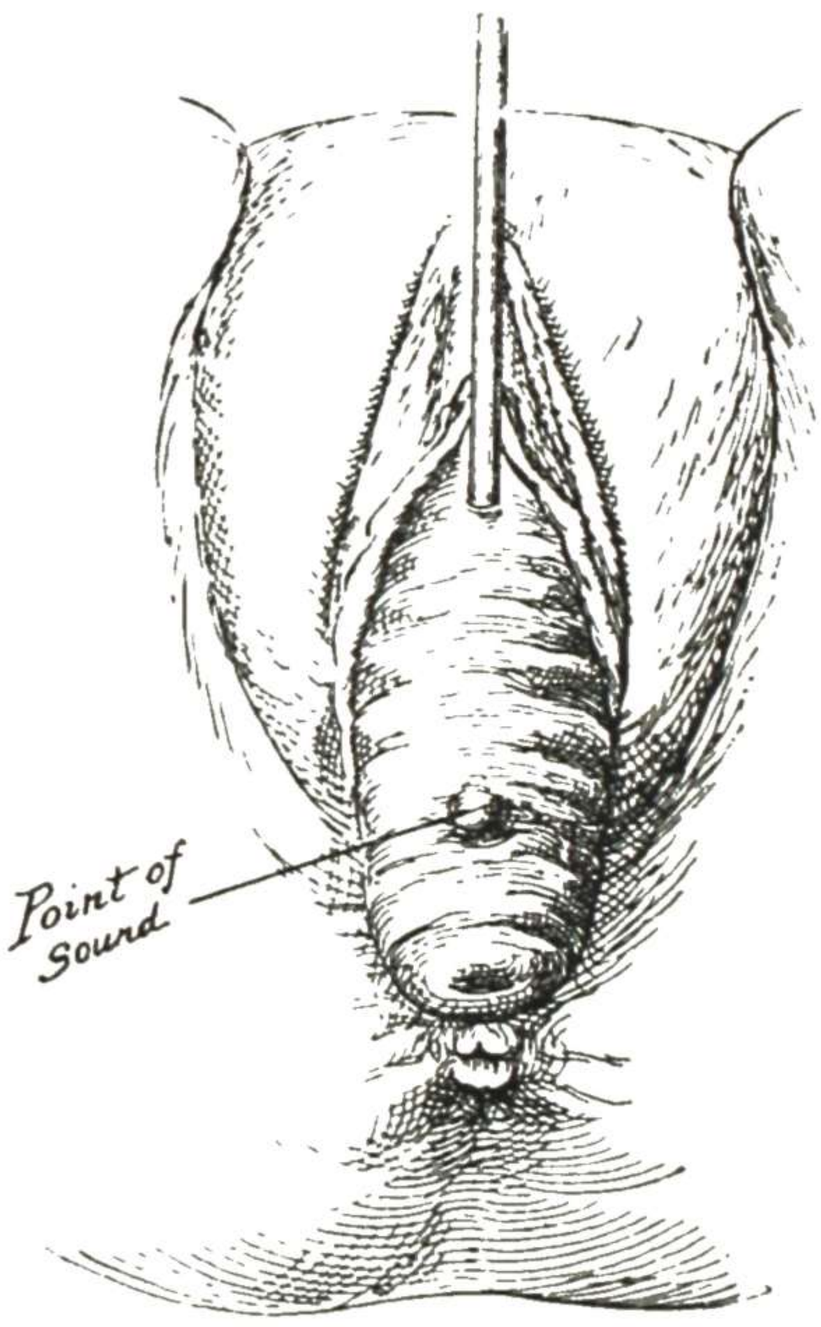


Fig. 588.

Fig. 587.—Determining the position of the body of the uterus by rectoabdominal palpation, in the differential diagnosis of prolapse from elongation of the cervix. (Ashton—*Practice of Gynecology*).

Fig. 588.—Testing position of bladder in a case of extensive prolapse, when the usual palpation of the mass still leaves the location of the bladder in doubt. (Ashton—*Practice of Gynecology*).

If the bladder has prolapsed also, it is felt as a thick cushion of soft tissue in front of the hard uterus. If there is a question as to the presence of bladder in the mass, a sound may be introduced to determine that point (Fig. 588), but it is better to avoid sounding the bladder unless there is strong reason for doing so, as it may introduce infection. The vaginal wall often presents spots of ulceration, especially about the cervix, and there may be much irritation over the whole mass and about the external genitals.

The residual urine and recurring attacks of cystitis and the dragging and narrowing and kinking of the ureters from the gradually increasing prolapse, eventually cause damage to the upper urinary tract.

The duration of the prolapse is a factor in the extent of damage—that is, all the time that a prolapse of considerable extent is allowed to continue without adequate support there is increasing damage to the ureters and kidneys. The

progress of such condition is so gradual that it may escape notice until brought to attention by infection in the damaged tract. In Fig. 589 is shown an autopsy specimen from a patient who came into the hospital with long-standing prolapse and uremia.

Investigators have listed various factors in such ureteral narrowing, such as, stretching and narrowing of the intramural portion of the ureter in the bladder prolapse, compression of the ureters outside the bladder by the con-

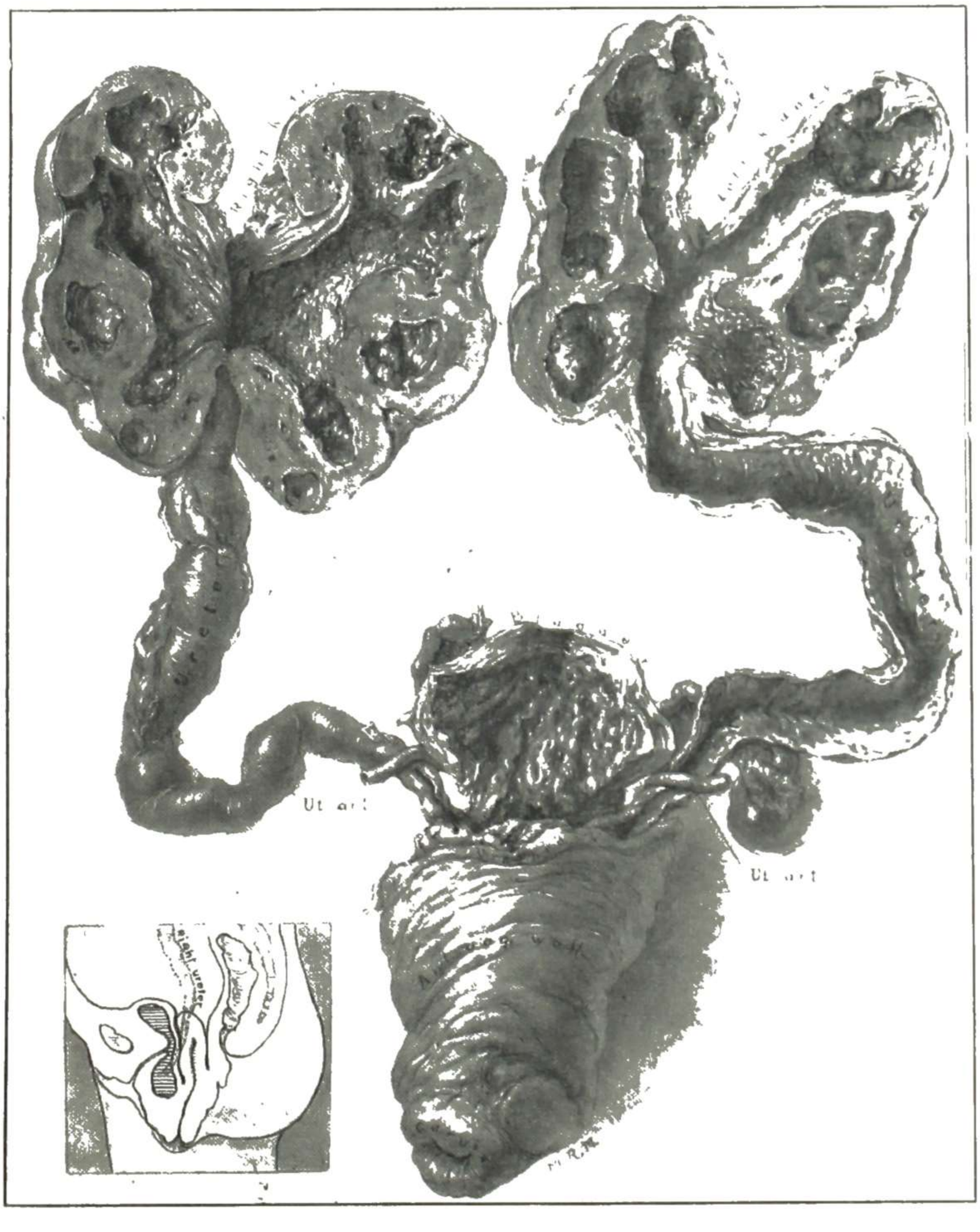


Fig. 589.—Autopsy specimen from a woman aged sixty-six years, who died of uremia. She had a prolapse of many years' standing, and careful dissection showed that on each side the constriction of the ureter caused hydroureter and hydronephrosis. The constriction was at the point where the uterine artery was dragged down over the ureter, as shown in the illustration.—(Wallingford—*Am. J. Obst. & Gynec.*)

stricting ring of the pelvic floor through which the mass prolapses, and constriction of the ureters by the overlying uterine arteries being pulled down over them. In the case shown in Fig. 589 the pressure of the dragged-down uterine arteries was apparently the particular factor in the ureteral stenosis, which led to the extensive double hydroureter and hydronephrosis. Infection entering the damaged tract completed the destruction of the kidneys.

Differential Diagnosis

Any swelling in the vagina or mass projecting outside may be mistaken for uterine prolapse, such as cystocele or rectocele or pedicled myoma, coming outside or still inside the vagina, or enlarged cervix or inverted uterus—all of which are shown in Figs. 590 to 595. Being rather unusual, the following conditions may cause an error in diagnosis:

1. **Hypertrophy of Cervix.**—In this condition (Fig. 594) the body of the uterus is felt nearly at its normal height in the pelvis. Also the depth of the uterus is increased, the amount of increase depending on the length of the hypertrophied cervix. Furthermore, the posterior vaginal wall is usually not pushed down, as it would be by a prolapse of the uterus, and the bladder is usually not involved in the projecting mass.

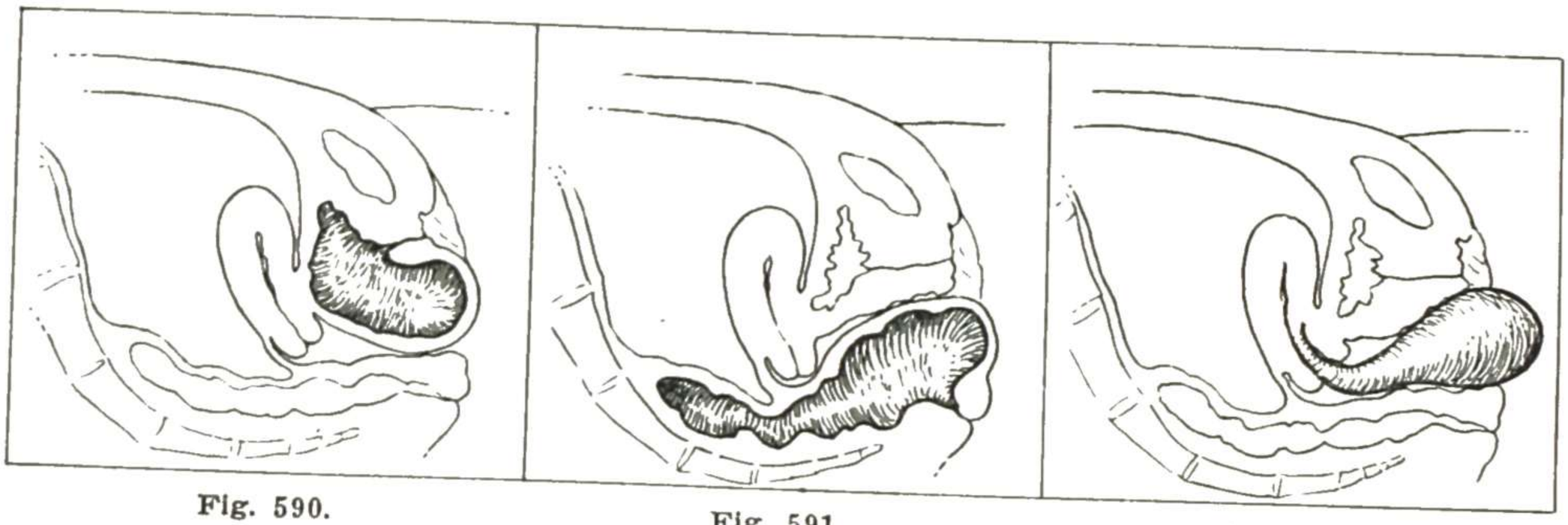


Fig. 590. Fig. 591. Fig. 592.

Figs. 590-592.—Differential diagnosis of prolapse of uterus. Other conditions that cause a projecting mass at the vaginal outlet, and which may be mistaken for uterine prolapse. Fig. 590, Cystocele. Fig. 591, Rectocele. Fig. 592, Projecting pediculated myoma.

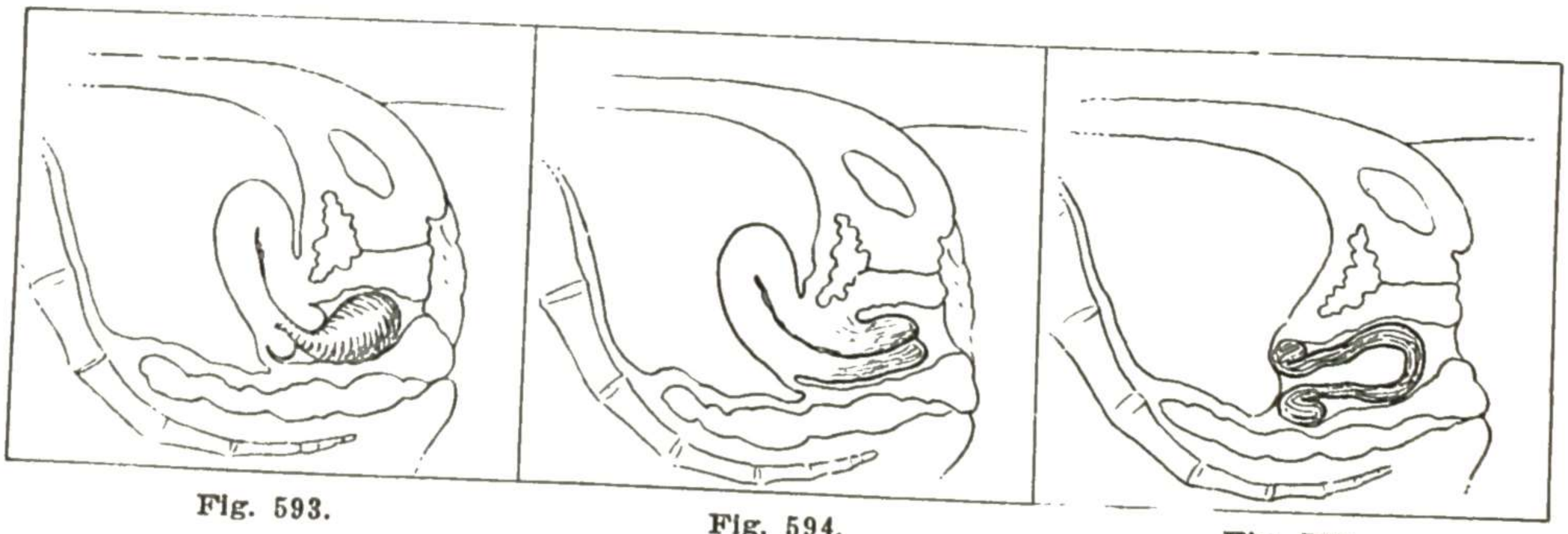


Fig. 593. Fig. 594. Fig. 595.

Figs. 593-595.—Differential diagnosis of prolapse of uterus. Other conditions that cause a mass low in the vagina. Fig. 593, Pediculated myoma from uterus. Fig. 594, Elongated cervix uteri. Fig. 595, Inverted uterus.

2. **Tumor or Cyst of Vagina.**—By careful digital examination, the cervix may be felt above the projecting mass and near its normal position.

3. **Tumors of Uterus, Projecting From Cervix.**—Such tumors are, of course, more or less pediculated and almost invariably they are fibroids. In such cases, there is felt near the vaginal entrance a mass, which may be hard or soft (Figs. 592, 593). If the mass is sloughing, part of it will be soft. No cervical opening can be felt in the mass and, by exploring higher around the mass, the cervical ring can be felt at the upper part of the vagina. If the tumor is sloughing, there is usually bleeding and a very offensive discharge. Furthermore, by bimanual examination, the body of the uterus may be felt near its normal position.

4. **Inversion of Uterus.**—In a case of inversion, a large mass, apparently a tumor, is felt in the vagina (Figs. 595, 607). The vaginal walls can be felt extending up past the mass. If it is sloughing, there will be bleeding and a foul discharge. Furthermore, the body of the uterus is not felt where it ought to be (Fig. 608, *A*). It is apparently nowhere in the pelvis, and by deep bimanual examination a depression may be felt with the abdominal hand at the upper end of the vagina—a cup-shaped depression with a hard margin, where the body of the uterus should be (Fig. 608, *B*). Inversion differs from a tumor in that a sound cannot be introduced far into the uterus, for the cavity is more or less obliterated.

Treatment

The means of treatment may be divided into two classes—palliative and curative.

Palliative Measures

The palliative measures after reduction of mass and treatment of irritation or ulceration are (1) pessary support, to keep the uterus and bladder within the pelvis, and (2) tampons and other palliative measures for conditions not suitable for pessary treatment.

Fig. 596.

Fig. 597.

Fig. 598.

Figs. 596-598.—Fig. 596, Flexible ring pessary. Fig. 597, Inflated ring pessary. Fig. 598, Hard rubber disk pessary.

1. **Pessaries.**—If there were no drawbacks to pessary treatment, its continued use in preference to operation might be advisable in those cases in which it gives subjective relief. But unfortunately there are drawbacks. Aside from the troublesome home care by the patient and the expense of necessary visits to the physician, there is the ever-present chronic vaginal and cervical irritation from the pessary. Much study has been given to the serious problem of eliminating this irritation, and considerable progress has been made. The most important thing is not the shape and materials of the pessary but the *removal* of it each night, thus relieving the pressure-irritation and permitting thorough cleansing of the vagina.

Ring Pessaries.—The ring or disk pessary (Figs. 596 to 598) is the simplest type of prolapse pessary. It is introduced edgewise and then turned so that the ring lies crosswise in the vagina. It is sufficient for some of the milder cases. If there is much relaxation of the pelvic floor, the ring tends to turn and slip out.

Menge Pessary.—The Menge pessary (Fig. 599) consists of a hard rubber ring with a detachable stem which prevents the ring from turning in the

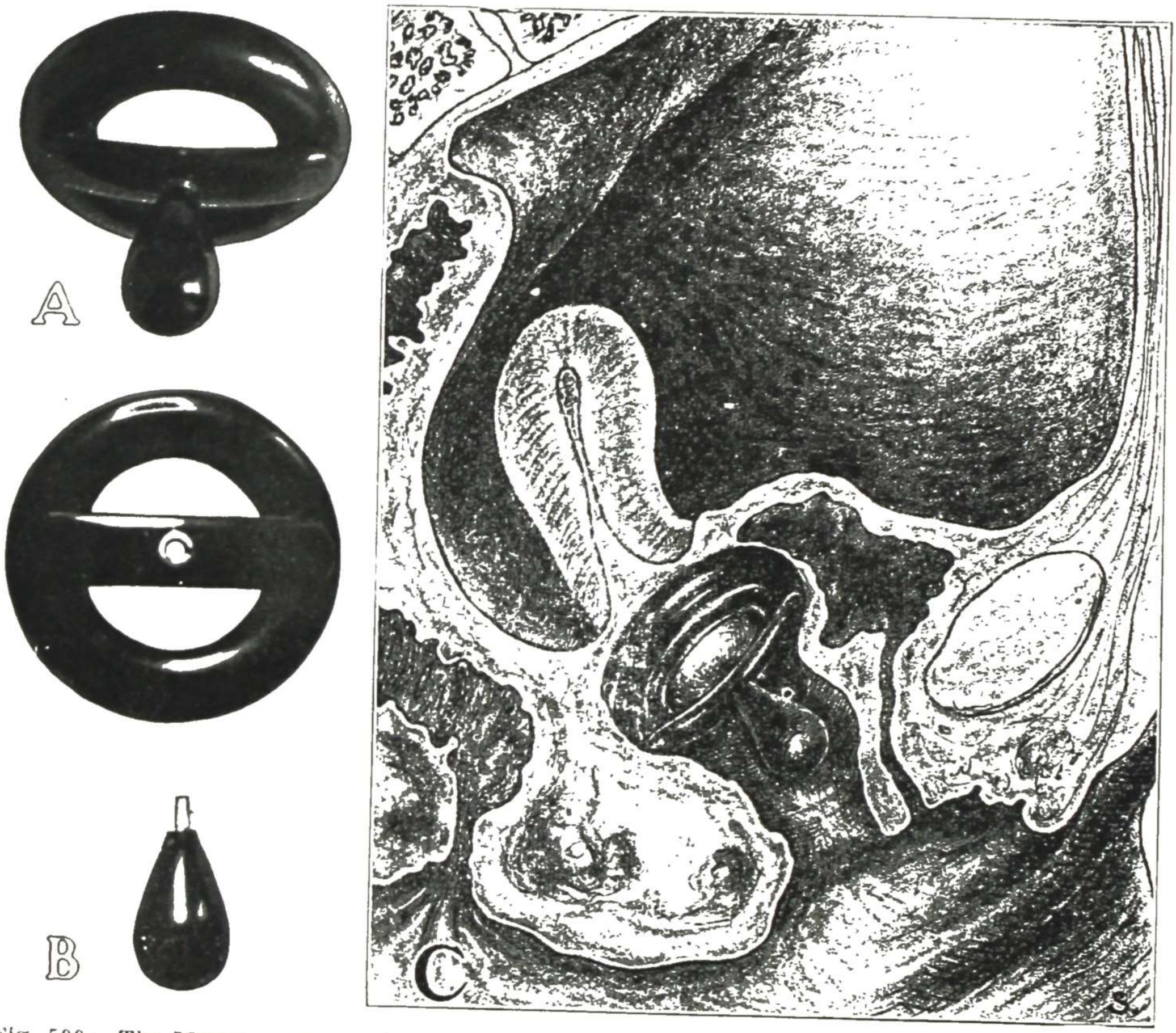


Fig. 599.—The Menge pessary. *A*, The pessary with the stem in place. *B*, The pessary with the stem detached from the ring portion of the pessary.

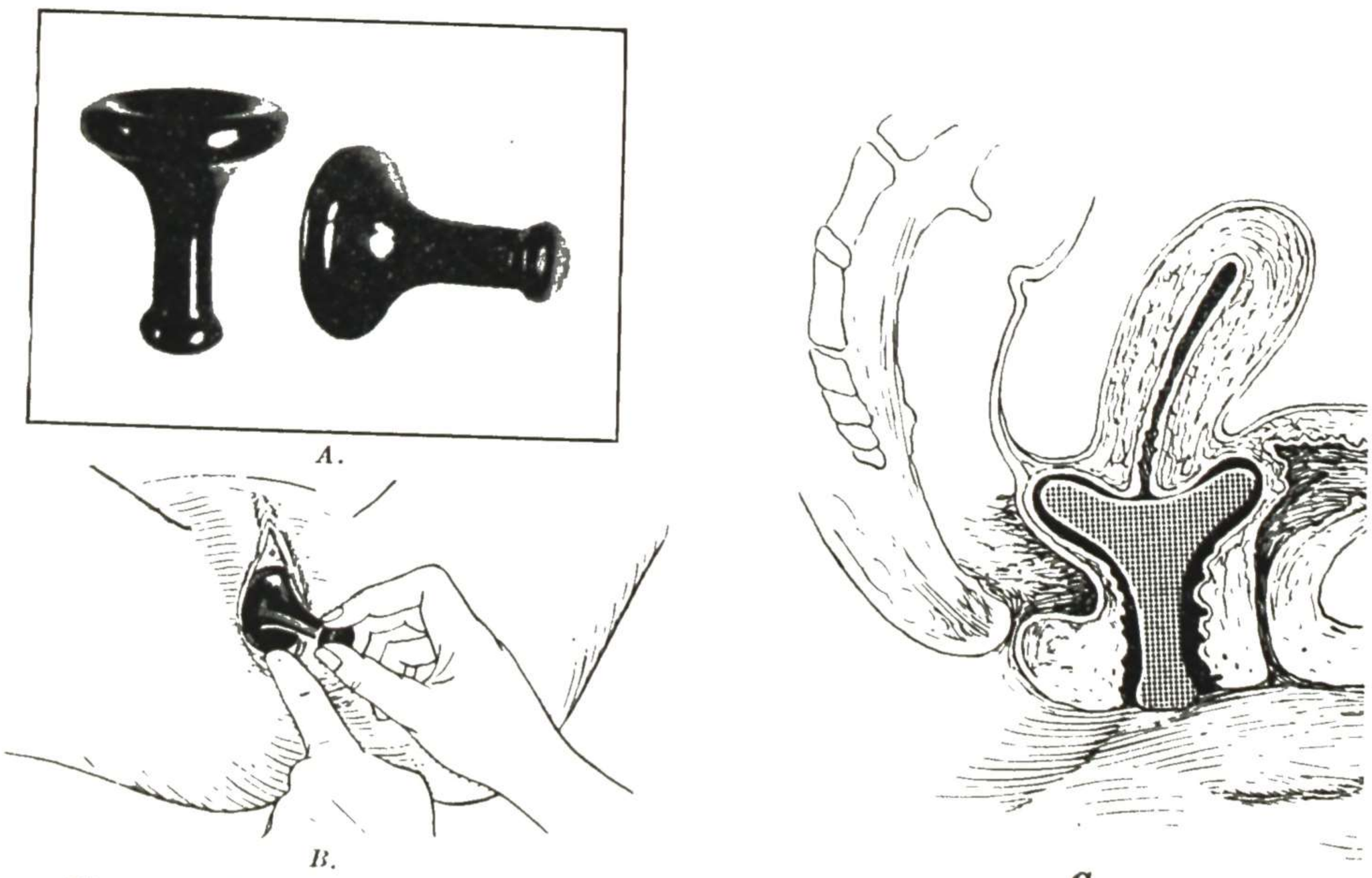


Fig. 600.—The Gellhorn pessary. *A*, General appearance. *B*, Introducing pessary. The perineum is to be strongly depressed. *C*, Pessary in place. (Gellhorn: *Am. J. Obst. & Gyneo.*)

vagina. As ordinarily used (left in place continuously between office visits) the Menge pessary has the disadvantage that it blocks the vaginal canal, thus interfering with cleansing of the vagina and with coitus.

By attaching the stem before introduction and using a smaller size of pessary, it is possible to introduce and remove it as one piece; and by definite instruction some patients may be taught to do so. It is difficult, however, for the patient to remove this pessary, because the stem is short and rounded with no ridge or grasping surface. This disadvantage is overcome in the Gellhorn pessary.

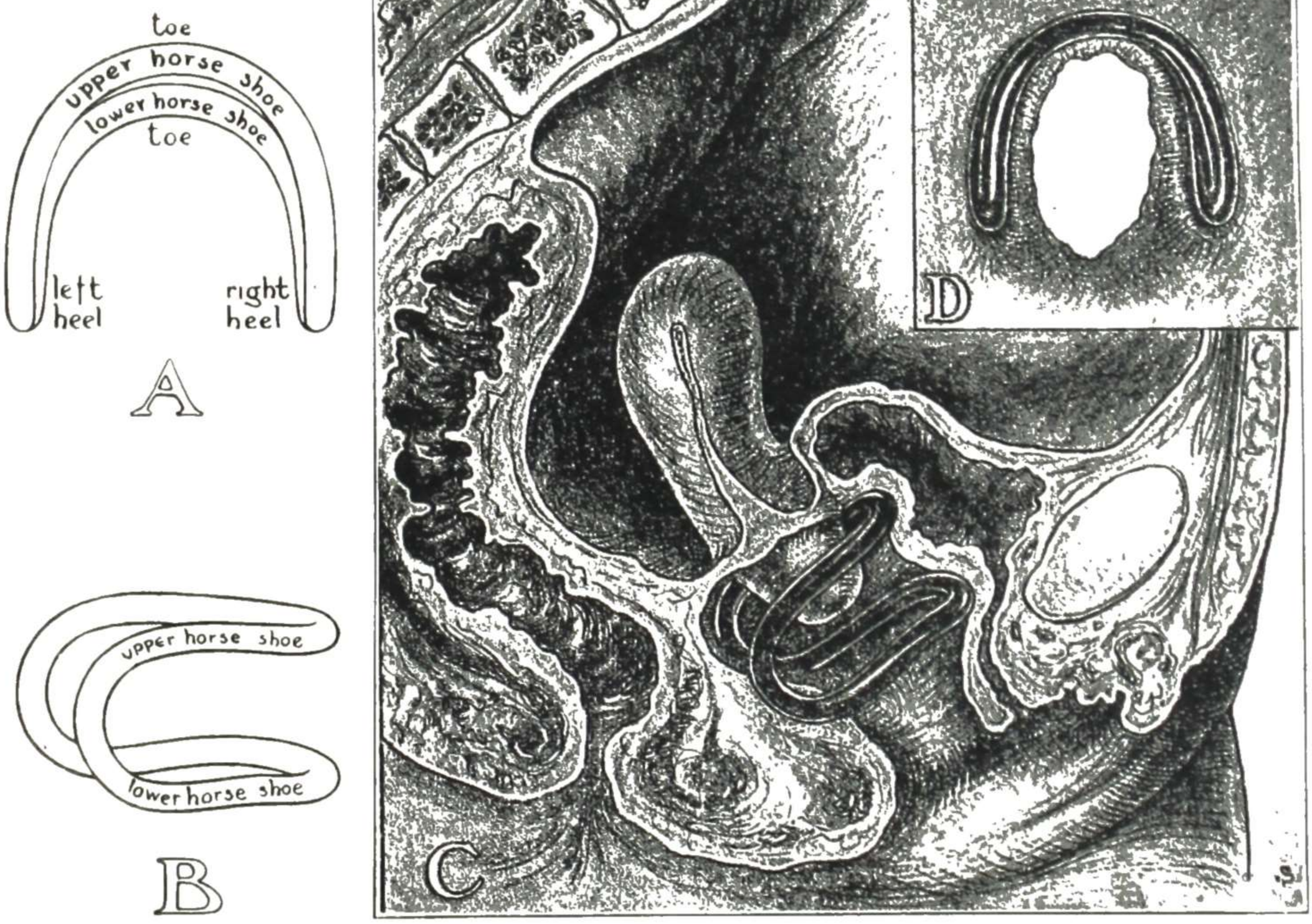


Fig. 601.—The Gehrung pessary. *A*, The pessary as viewed from above. *B*, The pessary as viewed from the side. *C*, The pessary in place, showing the action of the upper arch in holding up the uterus and base of the bladder. *D*, Showing how the heel on each side indents the tissues some distance from the vaginal opening, instead of pressing into the opening like a wedge, as do other pessaries.

Gellhorn Pessary.—This pessary (Fig. 600) has the supporting characteristics of the Menge type and yet is removable by the patient. The pessary is introduced as follows, quoting from Gellhorn's article.

"It is inserted, well lubricated, edgewise and in an oblique direction, so as to avoid the urethra, while the perineum is strongly pushed downward. It is introduced into the vagina by a corkscrew-like motion. Once within the vaginal lumen, the pessary is pushed upward until only the extremity of the stem shows in the vaginal entrance. The appliance then lies transversely beneath the cervix, as shown in Fig. 600, *C*. The patient removes the pessary every night by pulling on the handle of the stem, turning the latter to one side, and then reversing the steps of introduction. Straining downward will facilitate this procedure."

Gehrung Pessary.—In those cases of severe prolapse not amenable to the previously mentioned pessaries, particularly where the cystocele slips out beside them, the Gehrung pessary (Fig. 601) is very helpful. When properly placed, it usually gives effective support to the troublesome bladder and uterus, and yet does not interfere with vaginal-vault douching or with coitus. But it cannot be removed and replaced by the patient. In fact the manipulations of introduction are such as to require careful study and practice by the physician for his use of them.

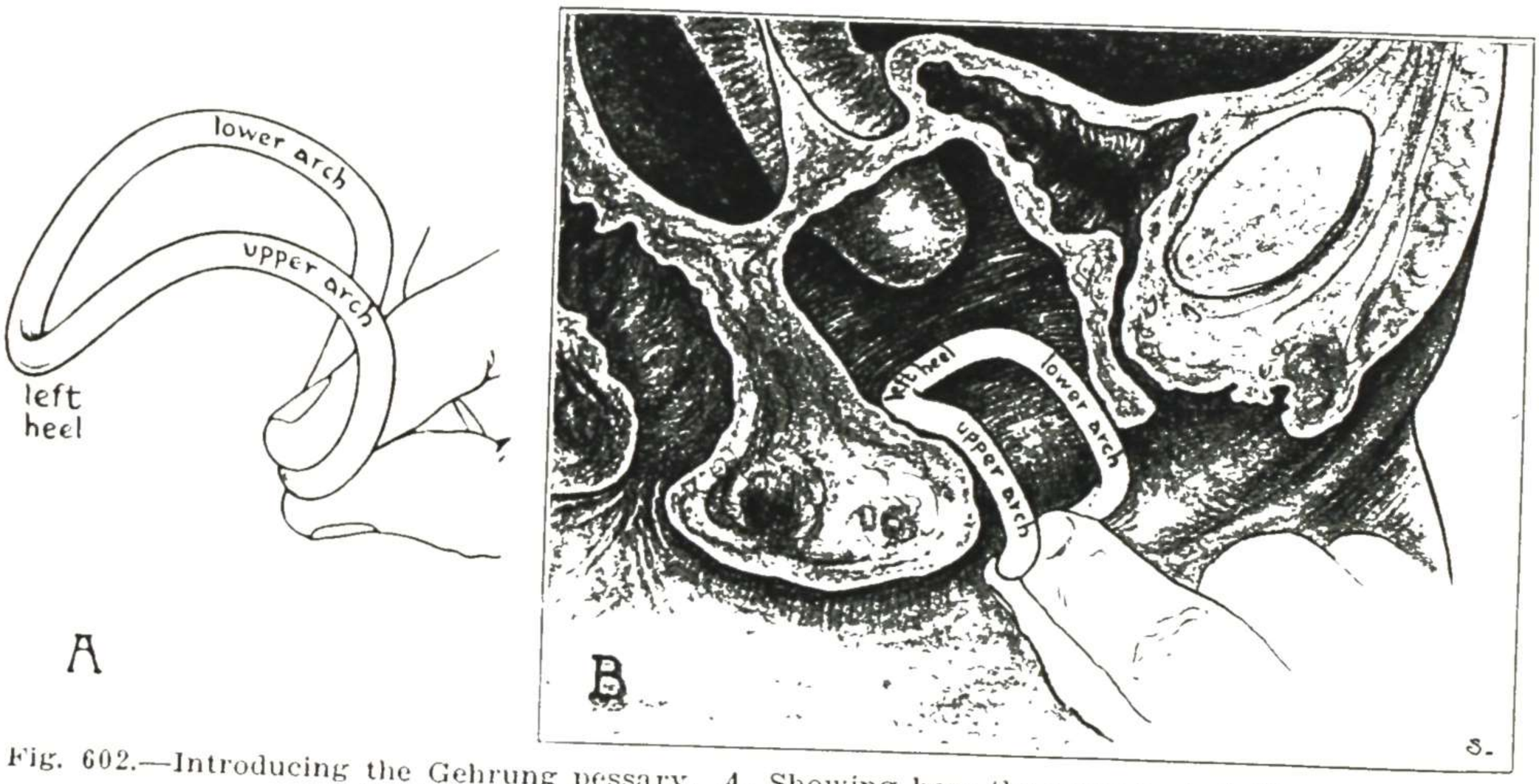


Fig. 602.—Introducing the Gehrung pessary. *A*, Showing how the pessary is held. *B*, First step in the introduction—see directions for introduction.

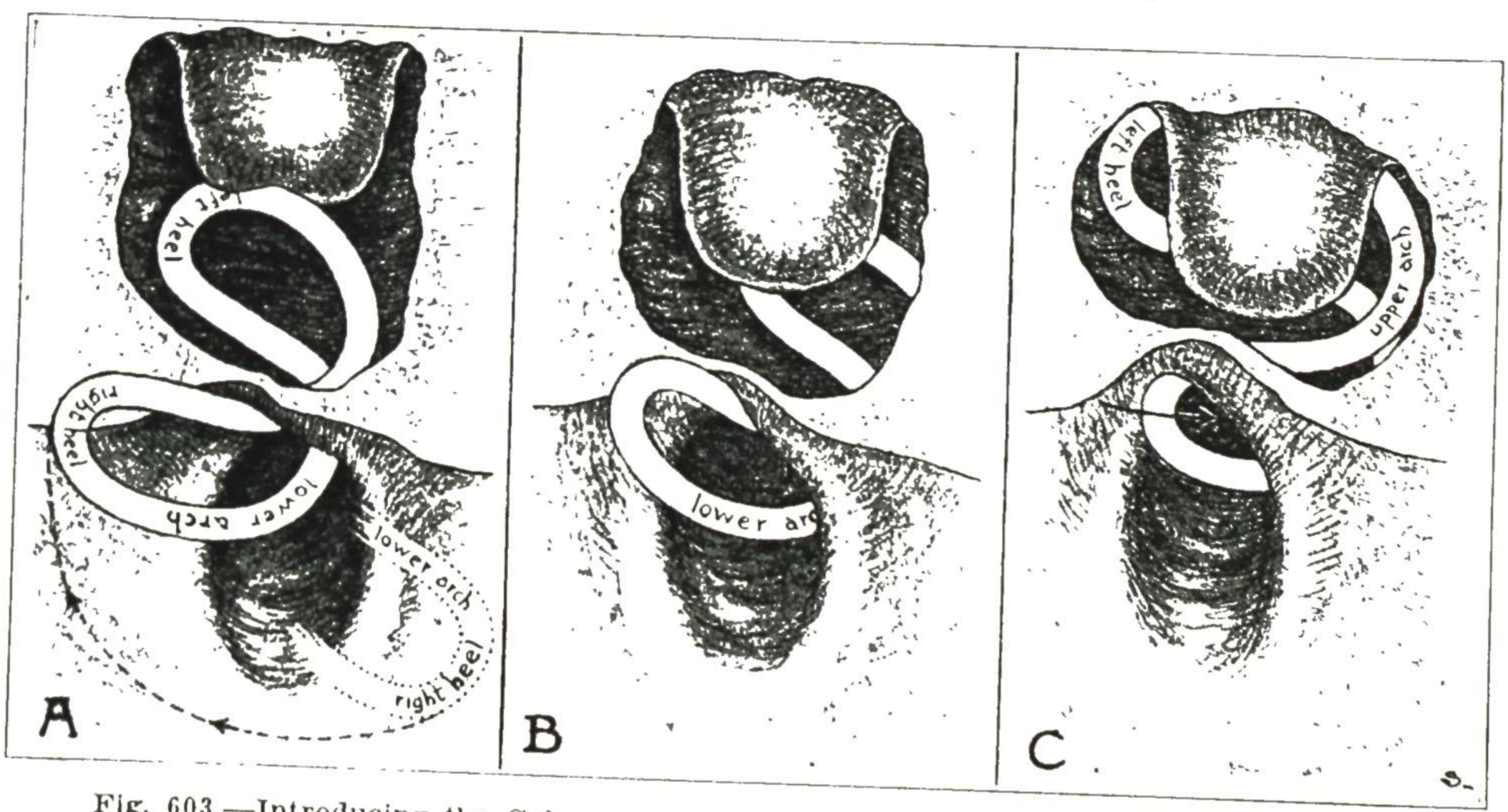


Fig. 603.—Introducing the Gehrung pessary. *A*, Swinging the right heel to the right side, which carries the left heel under the cervix to the left side and brings up the upper arch, which was below. *B*, Pushing the pessary around the vaginal wall back of the cervix, in order to get the right heel within the vagina. *C*, Further progress in the same direction.

The Gehrung pessary avoids the wedge-action by which other pessaries tend to dilate the vaginal opening, by pressing into the superior surface of the supporting shelf as shown in Fig. 601, *D*. This causes a depression on each side in which the pessary becomes "set" so that it does not slip around.

The introduction and satisfactory adjustment of the Gehrung pessary require considerable study and experience. In introducing the pessary the right heel is grasped in the fingers of the right hand, as shown in Fig. 602, *A*. The upper arch is below. With the right heel held to the left side of the vulva, the left heel of the pessary is pushed into the vaginal opening as far as it will go (Fig. 602, *B*). Then the right heel, still grasped in the fingers of the right hand, is swung across to the right side as indicated in Fig. 603, *A*. This brings uppermost the upper arch which was below, and causes the left heel of the

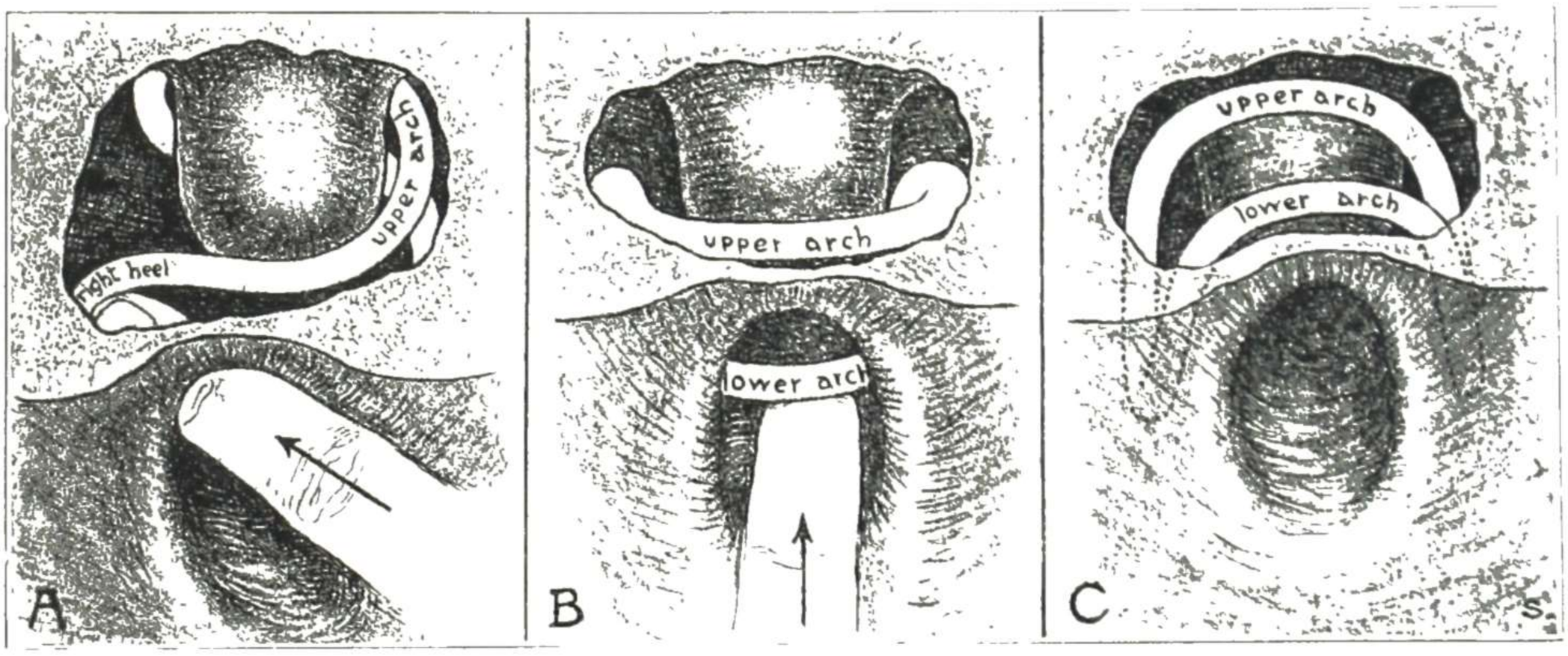
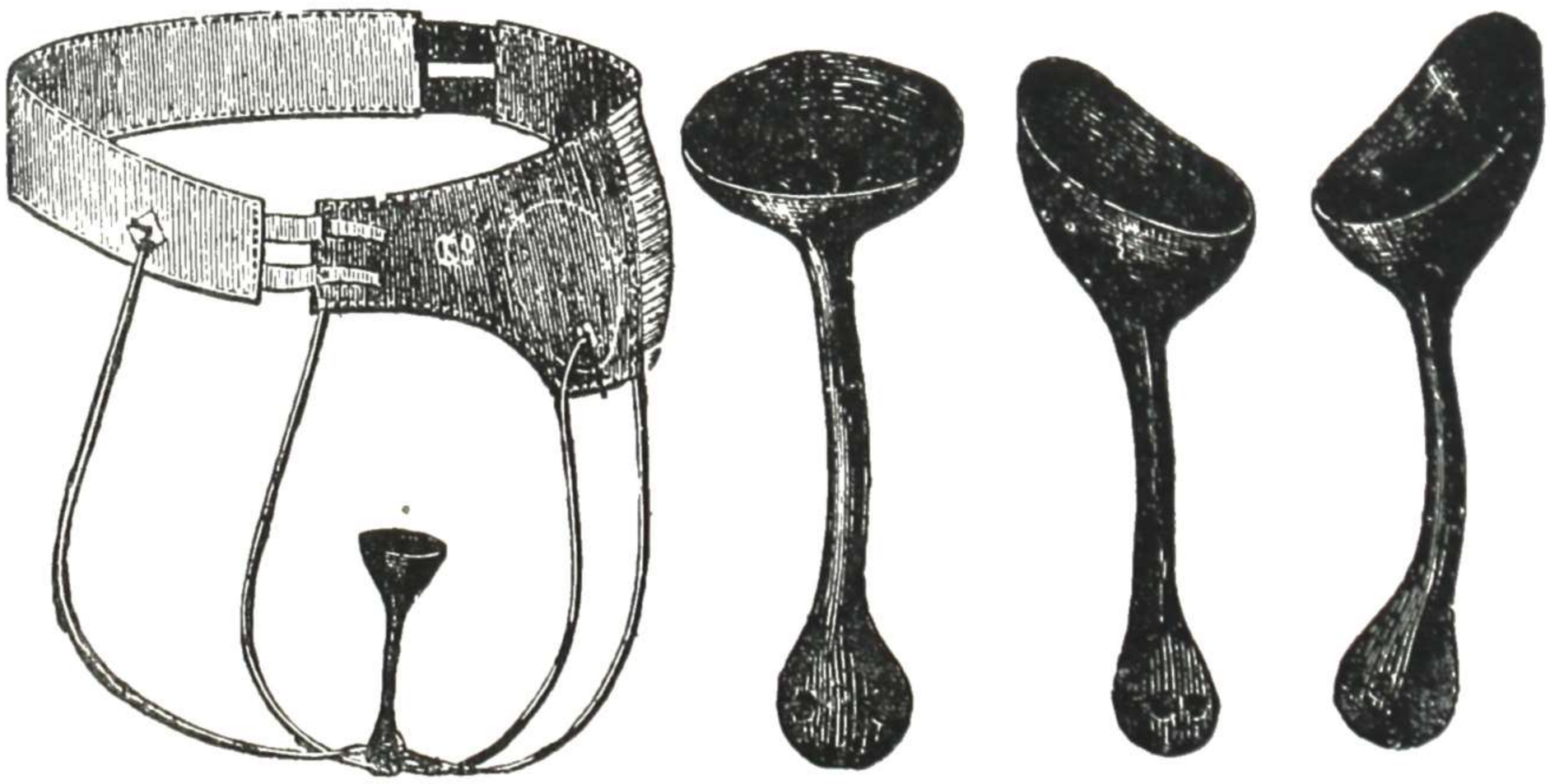


Fig. 604.—Introducing the Gehrung pessary. *A*, The right heel within the vagina and being carried to its position on the right side. *B*, The two heels situated symmetrically on each side. The arches are still too low. *C*, The arches pushed up into place back of the symphysis.



A. *B*. *C*. *D*.

Fig. 605.—*A*, Cup and belt pessary. *B*, *C*, *D*, Different cups that may be used.

pessary to pass under the cervix (Fig. 603, *A*) to the patient's left side (Fig. 603, *B*). Now the pessary is pushed in farther, the left heel passing around behind the cervix far enough to permit the right heel to slip inside (Fig. 603, *C*). The right heel of the pessary is then pushed along the vaginal wall to the right side (Fig. 604, *A*), until the right and left heels are situated symmetrically on each side of the vaginal opening (Fig. 604, *B*). The next step is to push the pessary up (Fig. 604, *B*) until the lower arch lies above the vaginal opening and behind the urethra, and the upper arch supports the uterus and base of the

bladder (Fig. 604, *C*). This puts the supporting arches in the position shown in Fig. 601, *C*, and the heels of the pessary take hold at the sides of the vaginal opening as indicated in Fig. 601, *D*.

If the heels tend to slip around at first, a little tannic acid powder may be used on each side, to prevent slipping until the heels become set.

Cup and Belt Pessary.—This form of support consists of an abdominal belt to which are attached rubber cords which in turn hold in place a hard rubber stem and cup extending into the vagina (Fig. 605). It is an old form of pessary which sometimes gives much relief in extreme cases in which every

Fig. 606.

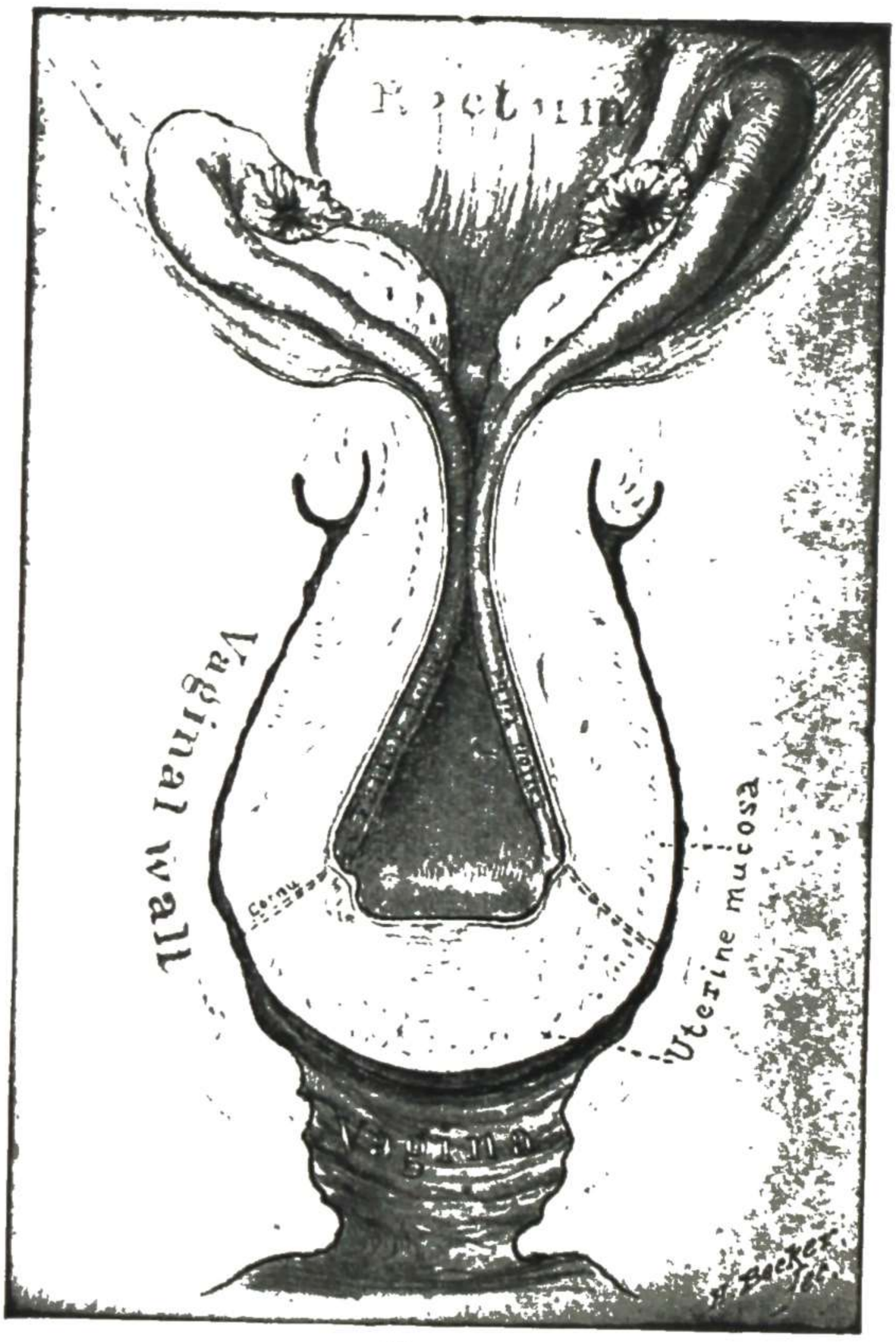


Fig. 607.

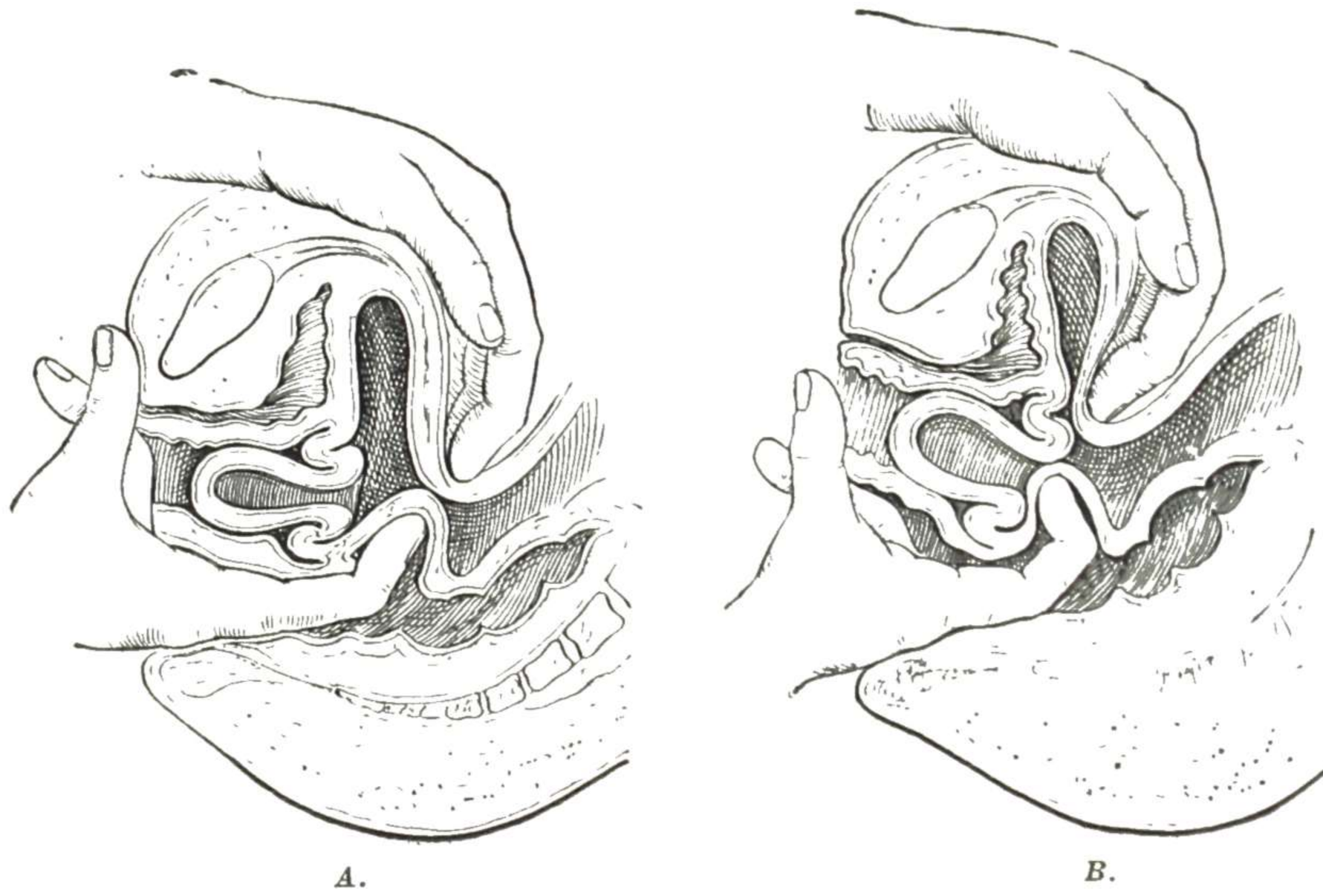
Fig. 606.—Complete inversion of the uterus, forming a large mass at the vulva. This is a postpartum inversion and the placenta is still attached to the turned-out fundus uteri. (After Bumm. Williams—*Obstetrics*, D. Appleton-Century Company.)

Fig. 607.—Inversion of the uterus, forming a mass in the vagina. (Kelly—*Operative Gynecology.*)

form of pessary depending on the pelvic floor for support slips right out. Of course this pessary, as well as other pessaries, is only a makeshift giving temporary relief, and curative operative procedures are indicated in suitable cases. But some of these women are not in physical condition for operation, while some others refuse operation, preferring to get along with a fairly satisfactory pessary. A modification sometimes useful is that form in which a ball is substituted for the cup at the top of the stem.

2. **Tampons, Rest in Bed, Astringent Douches.**—Where no form of pessary will hold the structures back, a firm vaginal packing of gauze or cotton tampons may be placed, preferably with the patient in the knee-chest posture or in Sims' posture. This packing will hold the uterus up temporarily and, by placing a pad over the vulva and holding it firmly in place by a strong T-bandage, the packing may be kept in place two days. This method is very useful when treating the ulceration often found about the cervix and also to give temporary relief while preparing the patient for operation.

If the patient can spare the time to go to bed and remain there a week or two, taking astringent douches when not packed, she will experience considerable relief from pain and discomfort. This is especially important when there is ulceration of the cervix or vagina requiring treatment.



A. *B.*

Fig. 608.—Diagnosis of inversion of the uterus. *A*, Determining the absence of the body of the uterus from the pelvic cavity. *B*, Determining the presence of a cupshaped depression above the cervix. (Ashton—*Practice of Gynecology.*)

Curative Measures

These are all operative and may be divided into two classes: (a) those that preserve all the genital functions, and (b) those that do not.

Prolapse of the uterus and adjacent organs giving sufficient trouble to require operative treatment requires extensive work by an experienced surgeon, with careful adaptation of method to type of prolapse and complications. Much advance has been made in the operative handling of prolapse cases, and the various operations suitable for different types of cases and complications are considered in detail and freely illustrated in our Operative Gynecology.

As to indications for curative operation, it is important to keep in mind the danger of ureteral narrowing and back-pressure when second or third degree prolapse is allowed to continue unrelieved over a long period. The advance of minor prolapse to the more marked degree is so gradual and with so little acute disturbance that patients become accustomed and adjusted to it,

and sometimes prefer to go along with the annoyance rather than submit to operation or employ pessary treatment with sufficient consistency to keep the uterus in place.

In advising such a patient, the physician must give weight to the demonstrated tendency toward ureteral narrowing, with the gradual insidious development of hydroureter, hydronephrosis and damage to kidney function (Fig. 589). These facts emphasize two items concerning treatment in prolapse cases. First, prolapse of second or third degree requires treatment (operative or by pessary) which will keep the uterus and bladder in place and check the tendency to hydroureter and hydronephrosis, even though there is no severe subjective disturbance from the prolapse. Second, a patient coming for operation for prolapse should have preoperative investigation as to hydroureter and hydronephrosis, that precautions may be taken to meet existing handicaps in that direction.

INVERSION OF UTERUS

Inversion of the uterus (Figs. 606 to 608) is a serious and rare displacement which is nearly altogether an obstetric affection. It occurs only in the puerperal state, except when due to the dragging weight of a tumor. When due to a tumor it simply constitutes one of the pathologic conditions incident to the tumor and does not require separate consideration. When occurring with a tumor, it is usually with a submucous myoma, and the condition is described and illustrated with that subject in Chapter VIII. The puerperal type (Figs. 606, 607) constitutes a serious obstetric emergency, of which full description is given in obstetric textbooks.