In the knee-chest position:
For anteflexion = stroke the Sacro-uterine
ligaments from the rectum.
For Retro-positions = push the fundus from
the rectum.
Apply a tampon (wool, generally small) back of the retro-
posed or retroflexed uterus.
Also, let the patient take this position morning + night for at least
10 min. to improve the drainage. Imperative!

# DISTORTIONS AND MALPOSITIONS.

DISTORTIONS AND MALPOSITIONS of the uterus may result from incomplete laparotomies or those in which drainage has been employed. Adhesions forming around the drain produce the most fantastic twists and bends in the uterus. Neoplasms and diseases of adjoining organs also cause flexions and displacements of the uterus. But such conditions will not be described here.

The more common forms of displacement are anteflexion, retroflexion, retroversion, prolapsus, and inversion. It must be borne in mind that there is no position of the organ which is normal to all women. The uterus is a movable body, varying in its position in answer to the condition of the bladder, rectum, and other pelvic and abdominal organs. It must not be assumed, because a given womb be found with its fundus behind the long axis of the pelvis in a retroflexed or retroverted position, or before it in an anteverted or anteflexed position, that the symptoms from which the woman is suffering come from the womb. Any of these positions may exist, and be perfectly natural and normal to a particular individual.

*Pathological Anteversion* is described by some authors, but we have never seen a case unless the uterus was displaced by a neoplasm, or adhesions or the distortion of some adjacent organ were to blame for the malposition. The uterus naturally follows the movements of the bladder, and is generally distinctly and normally anteverted when the bladder is empty.

## PATHOLOGICAL ANTEFLEXION.

This occurs in two chief forms. In simple anteflexion the axis of the cervix and the cervix itself occupy a normal relation to the vagina. But the body is sharply bent upon the cervix. These uteri are found high in the pelvis, drawn up toward the promontory of the sacrum. The uterus is somewhat fixed in that position, downward mobility being limited. The result is that, while the

woman is erect, the entire intra-abdominal pressure falls directly upon the posterior aspect of the uterus and the condition is still more aggravated. Whether this flexion be due to inflammatory short-ening of the utero-sacral ligaments thus drawing up the cervix is not proven, but possibly such is the case. The cervix is short and fairly well open, but sometimes stenotic. The sound often shows the depth of the uterus to be normal and the point of flexure to be at the internal os, or the whole organ may be of much decreased size (infantile uterus). The posterior wall opposite the flexure is
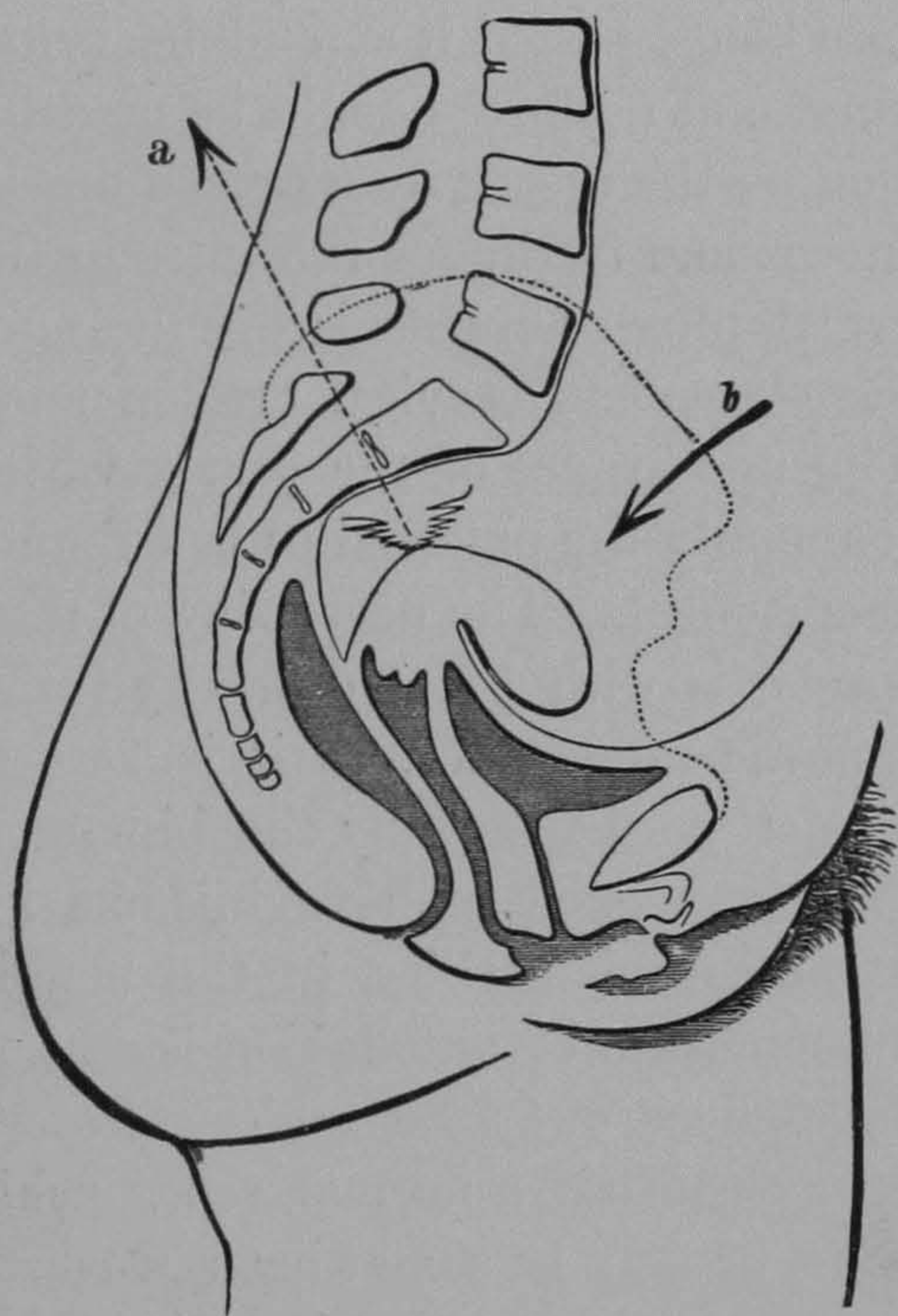
Fig. 151.



Diagram of Pathological Anteflexion arising from contraction of the folds of Douglas: *a*, direction of the traction of the folds; *b*, that of intra-abdominal pressure.

thinned, while the anterior is thickened. The endometrium is usually atrophied and poor in lymphoid elements. This is the common picture. But instead there may be marked hypertrophy. The cervical canal has lost much of its slit-like form, and is more tubular.

SYMPTOMS.—The patient usually gives some such history as this: She menstruates regularly. A few hours before the flow appears there is a good deal of pain located behind the pubes, intermittent and crampy in character, or continuous, severe, and with spas-

modic exacerbations. A clotted flow appears which affords relief for a time. She uses one or two napkins the first day or so, and, after lasting two or three days, the flow becomes thin and watery. It is followed for a longer or shorter time by a milky discharge which is unirritating, but of disagreeable odor. When the patient is up she has to urinate frequently, but is not troubled at night. Upon examination the uterus is found high up, the cervix small, and the fundus is easily detected as a rounded nodule above the anterior lip. Rectal examination is exceedingly valuable in that it determines the absence of the fundus from its normal position. If it is necessary to use the sound, the instrument shows the flexure and its degree. Before being passed it should be bent to the apparent angle of the flexure, and no force should be used in its introduction. Downward traction on the uterus by a tenaculum lessens the degree of bend in the uterus and facilitates the introduction of the instrument. The cervical plug of mucus is opaque and milky or clear, seldom purulent. Secondary cervical erosion and inflammation is not common. The appearance of the cervix varies greatly in different cases. Commonly the external os is a rounded hole, and the cervix more or less conical. The narrowing of the canal may be so marked that a probe is with great difficulty introduced. This is of no great diagnostic importance, as it is rare that the outlines of the uterus cannot be detected by the bimanual touch. These cases are commonly associated with vaginismus in the unmarried and with dyspareunia and sterility in the married.

The other common form of anteflexion is still more interesting, and may be designated as *anteflexion with retroversion*. The body of the uterus occupies nearly a normal relationship to the bladder and the pelvic walls, or may be somewhat retroverted. The cervix is so sharply bent upon the body that its axis is the same as that of the vagina. It is always hypertrophied, and may at times even be so long as to project from the vulva. The whole organ is somewhat lower in the pelvis than normal. This condition is really one of hypertrophied cervix bent upon the body, with, possibly, some retroposition and descent of the latter. The greater the hypertrophy the more the descent and backward displacement of the body.

Examination shows the enlarged cervix, often with a conical end and a circular os externum. The body is not always felt per vaginam, but is readily found by rectal examination. *Generally resting against the rectum and more or less blocking it.*

Because of the elongation of the cervix, together with the flexure, introduction of the sound is difficult. The total length of the canal is increased, but that of the body is about normal. If the organ be pushed high in the pelvis, the cervical elongation apparently decreases. The posterior lip is much longer than the anterior. The endometrium is the seat of hypertrophic changes, especially at the os internum.

It is an interesting fact that in all these cases of anteflexion the bladder is attached to the uterus abnormally high.

So far, no attempt has been made to explain the pathogeny of these two lesions. That simple anteflexion is associated with shortening of the utero-sacral ligaments is undoubted. Whether this shortening be congenital or acquired is most often not determined. Transverse sections of the child show that the os internum occupies a position relative to a line drawn from the symphysis to the end of the last sacral vertebra, much higher than in the adult. If any disease of infancy should decrease the elasticity of the utero-sacral ligaments, as the body of the uterus grows, the cervix being fixed, the body will fall forward on the bladder. The continuous force of intra-abdominal pressure, together with its increase by lacing, adds to the natural tendency the uterus has to bend. Also, when the organ is gorged with blood at the menses and the woman's body erect, with that pressure still more will it tend to bend.

In infancy the cervix is relatively large, but the hypertrophy accompanying certain flexions cannot be accounted for. It is utterly unlike any that occurs as the result of inflammation in the adult organ. The process is probably begun even before birth or in early infancy. Inasmuch as the cervix is first developed, the explanation may be found in some stimulus, giving this an impetus too early or too strong, resulting in unbalanced growth later on.

These patients have more flow than those suffering from simple anteflexion, and the pain is not so great; the blood does not clot as much. There is the same leucorrhea, and more of it. Backache and pelvic tenesmus are often present. Vaginismus and local nervous disturbances are common. The married are frequently sterile.

An explanation of the symptoms is here called for. The dysmenorrhea is due, not to the obstruction to the flow of blood, as stated by some authorities, but generally to the manner in which the flow is produced and the character of the blood. The epithelium,

instead of melting off, comes away in blocks and shreds. Casts of whole follicles may form. The blood is produced in too sudden a manner at first, and is sparsely mixed with lymphoid cells, and hence coagulates, instead of remaining fluid. The pain is produced because the endometrium is altered in essential particulars and because of the blood-clots. In those cases where the blood clots least the dysmenorrhea is least. It is to the altered condition of endometrium that the dysmenorrhea is due. The vaginismus and dyspareunia are purely secondary and dependent upon the nerve-irritation produced by the dysmenorrhea.

The subject of *sterility* of uterine origin can be dismissed in a few words.

Women with these flexed uteri who marry early in life, before the endometrium has undergone the structural changes described under the head of "Simple Endometritis"—conceive as readily as other women, although they may suffer from the most severe dysmenorrhea from clotting of the blood. It is as illogical to assume that a canal which admits a Simpson sound will refuse entrance to a spermatozoon, as that a spermatozoon may penetrate the minute Fallopian opening and yet not be able to enter the cervical canal in such cases as these under discussion. The obstruction theory of Sims and his followers will not meet the objections raised by more recent physiological and pathological investigations. The whole fabric of the uterus is made for the proper management of the decidua-forming endometrium. If this be markedly and generally diseased, its chief function is gone. The requirements on the part of the woman to conception are—patent tubes, discharge of an ovule, melting off of the epithelium from the surface of the endometrium, and engorgement of the rectiform tissue by lymphoid elements. If these requirements are not satisfied, conception does not occur. Flexure possibly produces degenerative changes in the endometrium, but it is those changes, and not the flexure, which prevents conception. Most frequently, however, the changes are brought about by induced inflammations.

Therefore, with a wrong interpretation of the menstrual function, and seeing but the grosser lesions, gynecologists have been but partial in their treatment of these lesions and the attending sterility.

TREATMENT.—The indications seem to be to relieve that lesion which produces the changes in the endometrium and give the woman

*cell-forming*

a new cytogenetic membrane. In the first form of anteflexion the
uterus is dilated thoroughly and washed out with boracic-acid solu-
tion. Now comes the essential part of the operation, for which the
dilatation is merely preparatory. As thoroughly as possible the
whole inside of the uterus is curetted, removing every possible ves-
tige of the endometrium. The cavity is again washed out. Iodo-
form gauze is then tightly packed into the uterus and the vagina
lightly filled with the same, this being left in four days. It is then
removed and no further treatment given.

The operation is best done two weeks before a period. The
patient is allowed out of bed on the third day; she should remain
in the house two or three weeks. If the operation is done for ster-
ility, and if there be no suspicion of gonococci in the husband's
urethra, connection should take place two days before and imme-
diately after the menstruation. No pessary is used or needed.

*Anteflexion with retroversion* is treated on the same principle—
removal of the endometrium and relief of that condition which
originally produced it. Here the latter is more difficult than in
simple anteflexion. The uterus is steadied by the bullet forceps,
and not drawn down much; the canal is dilated cautiously, to half
an inch; after this the uterus is washed out, thoroughly curetted,
again irrigated, and packed tightly with iodoform gauze, and the
usual vaginal dressing applied. The packing is removed on the
fourth day, and a light drain of gauze introduced just through the
internal os; no pain is produced. This second dressing remains in
two days more, and another is applied. The drains should be intro-
duced for two weeks. The curettage is the important feature. Pes-
saries are out of place in the treatment. If, as is usually the case, the
cervix be hypertrophied, it is at times impossible to sufficiently dilate
so that an effective curettage can be done and the uterus properly
packed. Besides, something must be done to do away with the
enlarged cervix. This can be accomplished by the following
method:

## ANTERO-POSTERIOR SECTION OF THE CERVIX.

The cervix is pulled down into the axis of the vagina, and the
length and shape of the canal determined by the sound. A blunt,
straight bistoury is introduced to the internal os, and the posterior
lip of the cervix is split for two-thirds of its length, the incision being
in the middle line. The bistoury is now introduced again and the

18

anterior border of the internal os is nicked.  The cervix is now care-
fully but thoroughly dilated and the uterine cavity curetted and
irrigated with salt solution.  The parts being wiped dry, the ope-
rator picks up the cervical mucous membrane at the old external os
with his needle, brings out the needle upon the raw surface, and
picks up the mucous membrane of the vaginal face of the cervix.
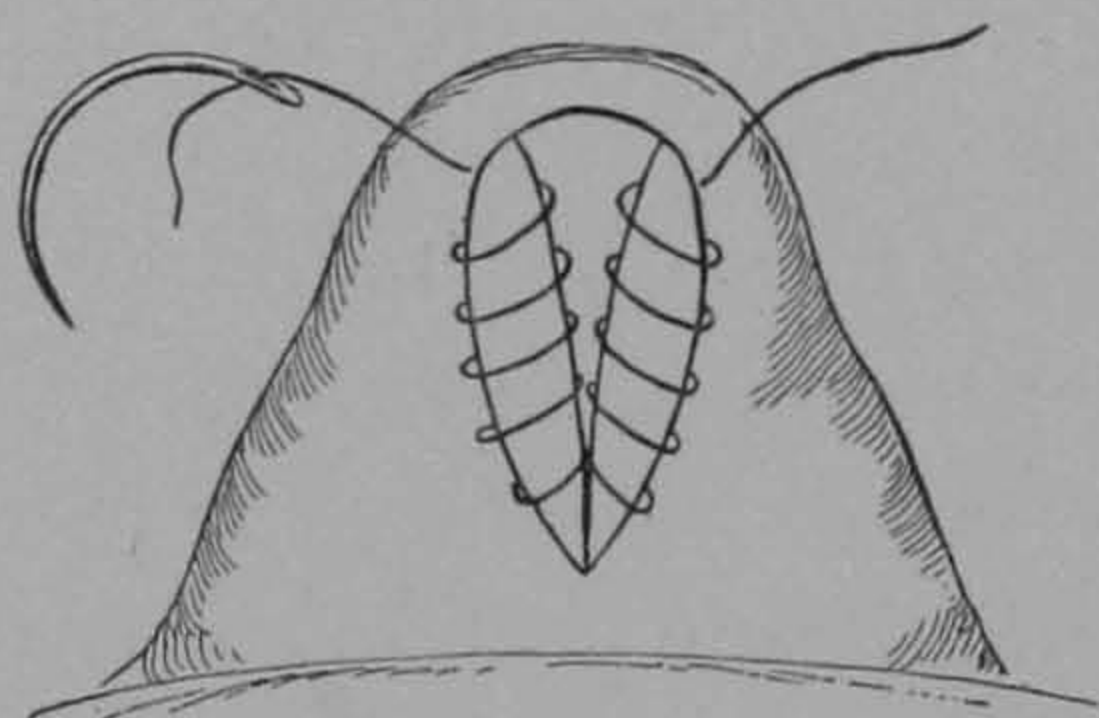
Fig. 152.
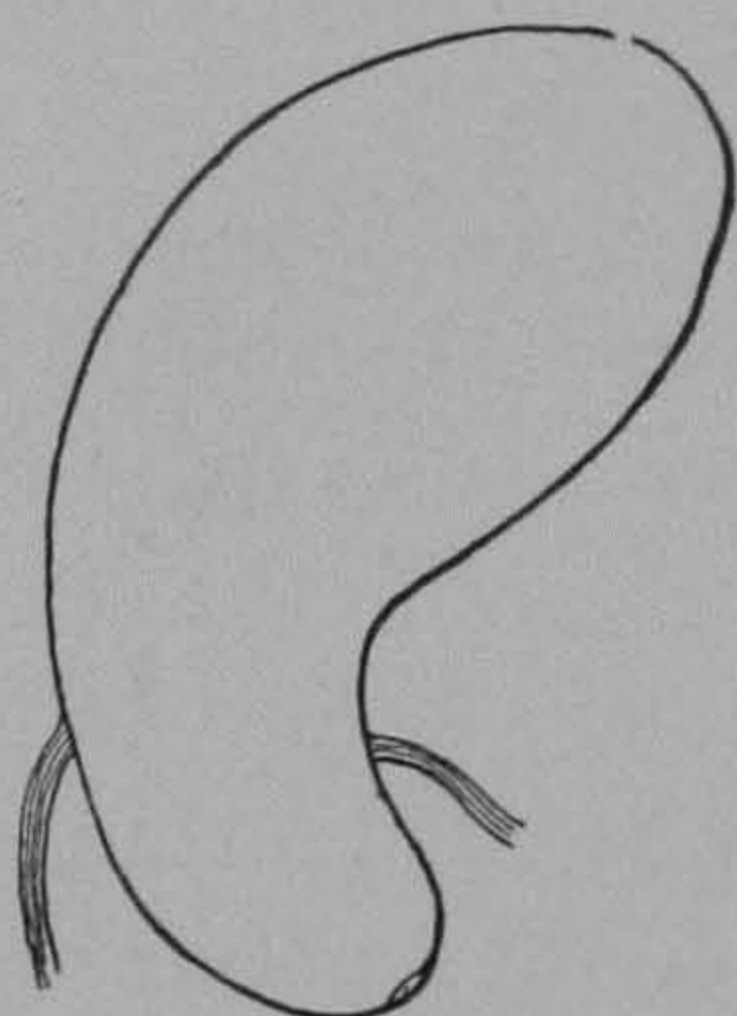
Fig. 153.

The congenitally enlarged cervix.
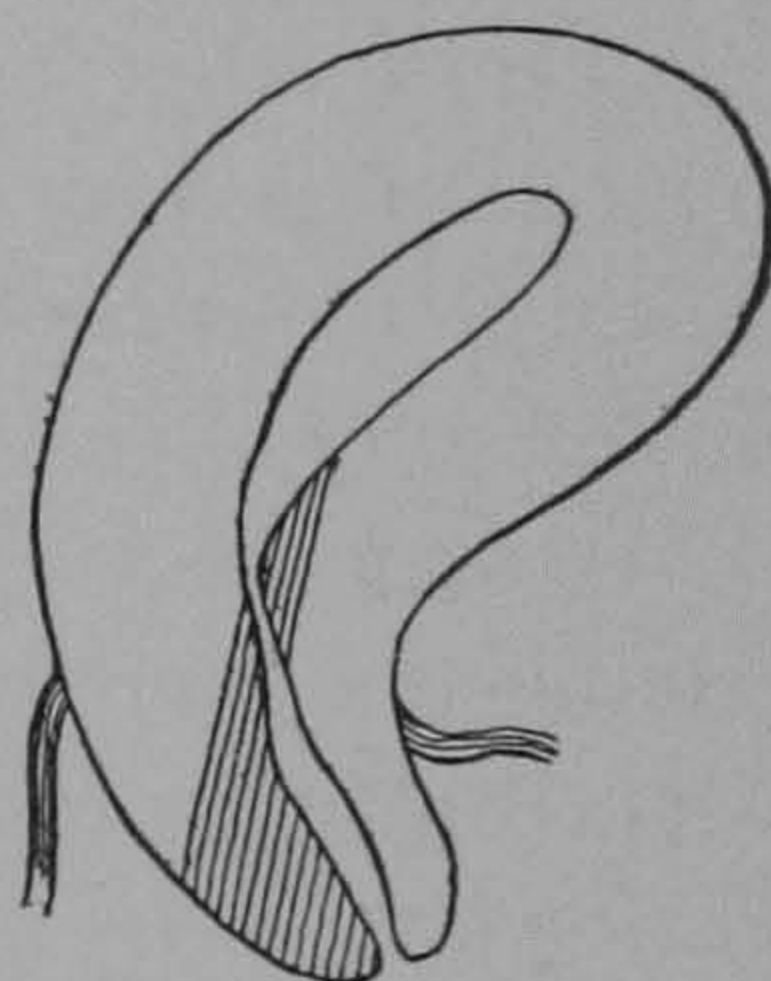
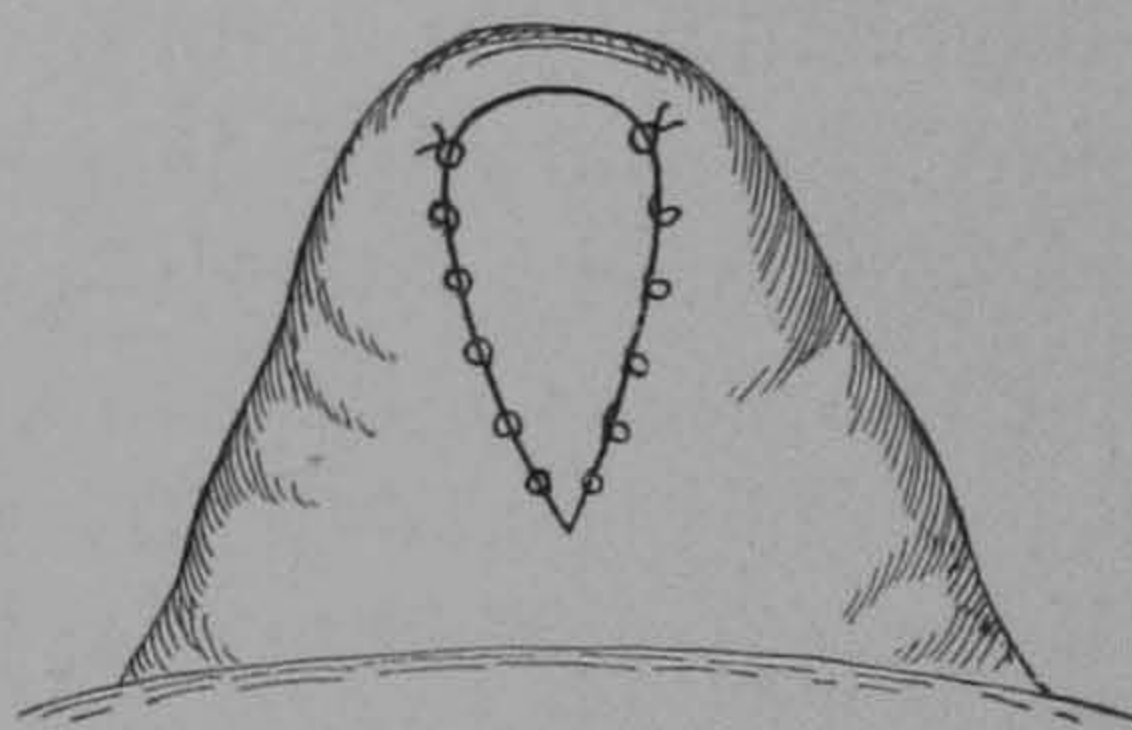The shaded portions show the extent of the incisions.

Tying the suture, it will be seen that the covering of the cervix
is folded over the raw surface and is united to the cervical mem-
brane.  Using the suture as a continuous suture, the operator pro-
ceeds down one side of the incision and closes in the raw surface

Fig. 154.

Fig. 155.

The method of applying the running suture.

The completed operation.

entirely.  When he gets to the angle or posterior part of the cut,
he proceeds up the other side in a manner similar to that employed
on the first, and upon arriving at the top the suture is tied.  The
cervical canal is now converted from the round tube which it first
was to one of conical shape.  The uterus is again irrigated and is
packed with iodoform gauze.  The vagina is also packed with gauze.
All dressings are removed in two days and the vagina alone is
packed.  The patient is allowed out of bed in four days.  The suture
of silk is removed in about a week.  After-treatment is unnecessary.

The cervix shrinks after this operation, so that after the lapse of a few months but little of the hypertrophied portion is left.

The uterus, relieved of the weight of the enlarged cervix, also rises in the pelvis and assumes a more forward position. Should the cervix be much elongated or hypertrophied, it should be amputated. Both the amputation and the curettage may be carried out at the same sitting.

If it be decided to amputate the hypertrophied cervix, not more should be removed than two-thirds of that which it is desired shall be the ultimate decrease in size. Atrophy incident to the operation will remove the rest.

There are still those in America who teach and practise the use of *stem pessaries.* Inasmuch as for years we were so placed that we could observe daily the results of their use, we feel qualified to speak on the subject. Those who use them consider the cervical stenosis as the objective point. Having made incisions of the cervix, the uterus is not washed out and is not curetted, but dilatation is done. The pessary is then introduced and retained in place by a cotton tampon in the vagina. It is removed in three days, and an application of iodine or carbolic acid made to the endometrium, and the stem again put back. If the uterus simply be anteflexed, the stem will stay in without support; but if the cervix looks out in the axis of the vagina, the stem must be retained in place. These stems are straight and are forced into place in the flexed canal. They act, according to those who employ them, by straightening the canal and establishing drainage. They keep the incised and dilated canals open without doubt, and, as they are left in during the menses, connection, and douching, the discharges are very profuse—more profuse, in fact, than before they were used; hence their advocates consider that they are draining away discharges, when in reality they are producing them. Success is obtained under their use, if at all, after six months' or longer treatment.

If sterility and dysmenorrhea were due, as maintained by nearly all stem-pessary men, to the stenosis, they should be at once cured by the operation. But these gentlemen treat the endometrium for a long time to "get the secretions healthy," they considering that spermatozoa will not live in purulent secretions, in spite of the fact that the emissions of every gleety man are filled with them. They do not know that the fault lies with the structurally changed endometrium. Their applications do some good,

but it is tardy and comes when the patient is about worn out with treatment. The percentage cannot be estimated accurately, but we have known so many inflamed tubes come from this treatment that we believe they do nearly as much harm as good. If used in a case of simple endometritis, that speedily becomes purulent.

The stem pessary requires months to accomplish a result; it produces pus, it frequently causes inflammation in the tubes and peritoneum; it does not drain, and it does not cure endometritis. The sole beneficial feature in this method lies in the application of iodine and carbolic acid. Contrast this procedure with that of curettage. We have seen conception follow within five weeks after a curettage, and it not infrequently results at the second or third period following the operation. There is produced no pus, there is no long treatment, there are no accidents, and the results are not infrequently immediate relief from the dysmenorrhea.

It but remains for us to say that the treatment of anteflexion by the stem pessary is not based upon accurate ideas of the lesion and the function of the endometrium, and is at times altogether irrational.

We repeat, the object of the whole operation is to give these women new endometria, forming under propitious circumstances, and as soon as possible to obtain conception in the married. In the unmarried the relief from the dysmenorrhea is often permanent.

There is another procedure which, while it has little effect upon the condition of the endometrium, affords temporary relief from dysmenorrhea. We refer to *dilatation* without curettage. The use of the dilator without ether is exceedingly painful in these sensitive women; it is of but temporary benefit, and must be repeated many times; it is done under conditions where exact asepsis is impossible, and therefore has attached to it the risk of infection; and, furthermore, it occupies a middle position between *operation* and *treatment*, with none of the good results of the former, and all the dangers of the latter, in most hands. Long after-treatment of these nervous women is inadvisable, because it keeps constantly before them their malady. They become hypochondriacal and utterly miserable, and prone to magnify their really trivial troubles.

There are many cases where it is difficult to decide what operation to do. The three factors which guide us in the selection are the symptoms calling for treatment, the amount of cervical hypertrophy, and the axis of the cervical canal to that of the vagina, this being normally from about 50° to 60°.

In all intra-uterine manipulations the most precise asepsis must be observed, lest we convert a simple into a septic endometritis and extend a septic endometritis into a tubal or peritonitic involvement. A woman who has once had either complication occupies a position in society far different from one who has not, and goes through her life with the possibility of celiotomy ever before her.

With this caution we may say that dilatation may be done so as to do the patient no possible harm if the proper precautions are taken. Still, it is an undoubted fact that the instrument has been most recklessly used. If curettage is not adopted, dilatation once every month, a few days before mensuration, will give most patients much relief from pain. But our experience is that the method is applicable to cases of short cervix only. Certain of these cases of dysmenorrhea suffer so much that the use of narcotics is demanded. If the woman be plethoric, she should be put upon an almost exclusive vegetable diet for two weeks before her perioid. To relieve the spasmodic pain, the following is most useful in a single dose when the pain begins:

| | |
|---|---|
| ℞. Chloral hydrat., | gr. x ; |
| Tr. cannabis indica, | ℥xv ; |
| Ext. gelsemii fld., | ℥iij ; |
| Aquæ, | ad f℥ss. |

This dose should not be repeated within six hours, and the patient should be put to bed with the first dose.

If the flow is excessive after giving the first dose, Tr. cannabis indica in 10-minim doses may be given alone every three hours for six doses, or codeia gr. $\frac{1}{2}$ and phenacetin gr. v may be administered in capsule.

The use of morphia is absolutely contraindicated, for with periodic suffering it is most easy to contract the morphine habit. To prevent the recurrence of the attacks at each period saline laxatives associated with a limited diet will do much.

### ANTEFLEXION COMPLICATED BY THE MENOPAUSE.

When the menopause occurs in old maids with anteflexion, it produces a very distressing train of nervous phenomena which properly come to the attention of the gynecic surgeon. The fundus rapidly atrophies and leaves the cervix proportionally much en-

larged. The cervix also finally retrogrades, the nerves are caught and compressed in the shrinking tissue, and the discharges are retained. The os is but pin-hole in character, and the whole cervical canal much decreased in dimensions. These uteri are originally but poorly and irregularly developed, their owners go through life suffering from dysmenorrhea, and when the menopause comes the atrophy takes place irregularly. They are complicated by a simple endometritis. All the treatment that is needed is dilatation of the cervix. The curette and gauze packing are seldom required for the endometrium, but it is better to introduce a filament of gauze into the cervix, leaving it in for a week, with a gauze vaginal dressing. No after-treatment is necessary.

These cases are often subjected to the stem pessary and electrical current. Being high-strung, nervous, almost irrational creatures, long continued local treatment has a deleterious effect upon both their mental and moral qualities. Medicinal treatment can give them little or no relief. If surgical aid be refused it may become necessary to resort to opium in some form at each recurring monthly period. Such treatment, although effective, is exceedingly dangerous, and should only be practised when all else fails. Such methods of relief as are given in the chapter on Dysmenorrhea should be tried before resorting to the use of this drug.

## LATERAL FLEXIONS.

These are generally the result of some inflammatory lesion outside the uterus, such as adhesions, and of that common form of contraction in one broad ligament which follows puerperal septic salpingitis. They are not amenable to extra-peritoneal treatment, and are purely secondary.

## RETROFLEXION AND RETROVERSION.

*Congenital retroflexion* is exceedingly rare. The uterus is invariably back in the pelvis and sharply bent upon itself, the flexure being at the os internum. The cervix is normal or slightly below normal in size. The flexure is exceedingly sharp, the fundus occupying the cul-de-sac. In rare cases no sulcus can be felt between the cervix and the body. If at any time there has been peritonitis, the body of the uterus is usually adherent to the rectum, rendering the deformity irreducible. The anterior wall opposite the internal os

is so thinned as to be membranous, while the posterior is much thickened. Schultze attempts to explain uterine flexures by ascribing them to intra-abdominal pressure acting upon the uterus at some point fixed by inflammatory tissue, and he describes a retroflexion due to fixation of the cervix anteriorly. The dilating and contracting bladder renders such a condition all but impossible. It is surely so where the flexure is congenital. So rare is this condition that Winckel describes but four cases. The uterus is close to the sacral curve and not lower than normal. It seems to be displaced directly backward. The fundus presses upon the rectum, and the total length of the uterine canal is decreased. All have some form of endometritis, often purulent. The ovaries and tubes are usually normal in position, and do not follow the fundus. The symptoms are uniform, with trifling variations: continuous, severe backache; pelvic tenesmus; difficult defecation and the passage of small stools; frequent headaches (occipital), especially

FIG. 156.
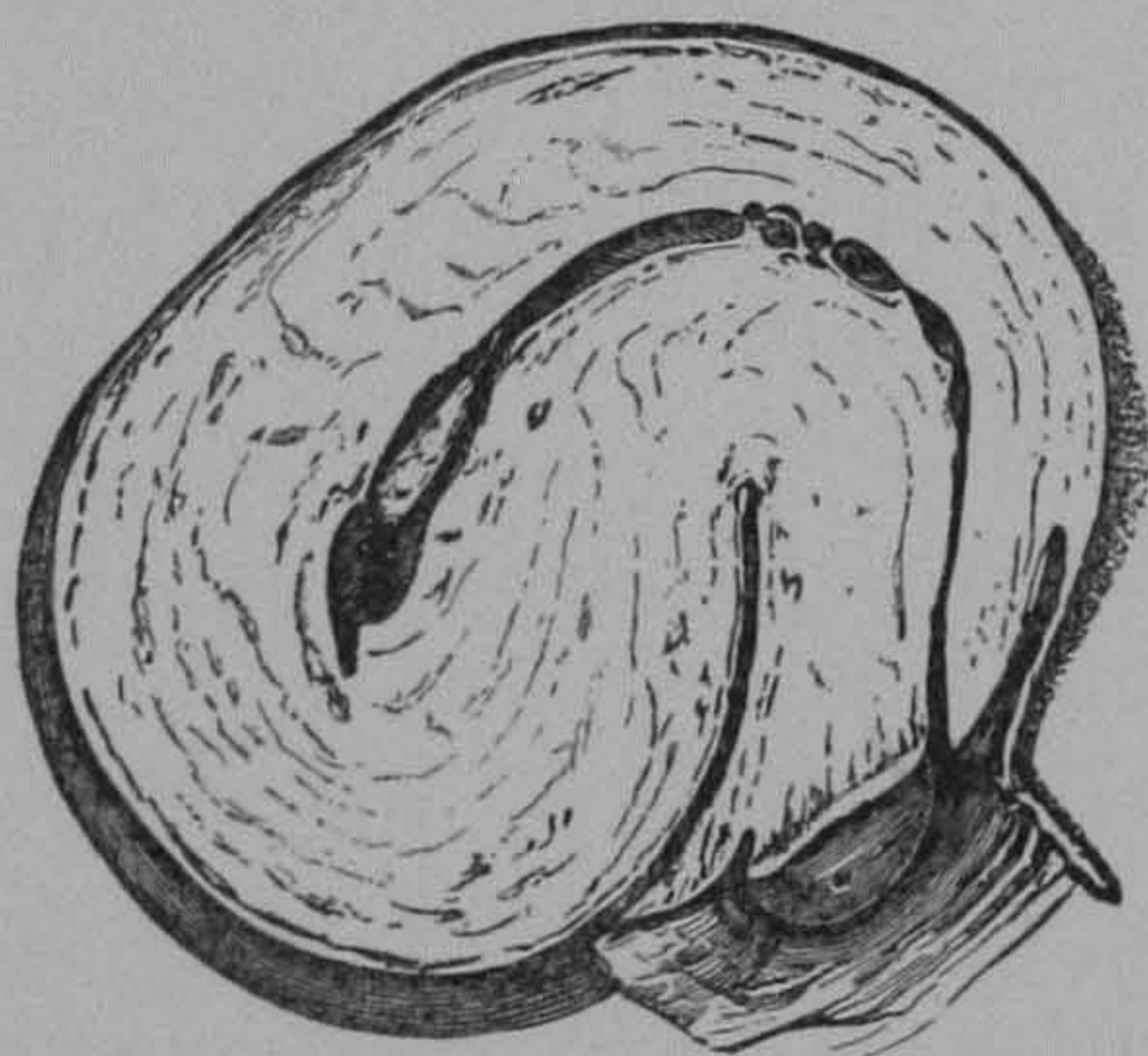


Extreme Retroflexion.

at the periods; dysmenorrhea, severe and identical with that accompanying anteflexion, with a scanty flow and passage of clots. Bimanual examination reveals the direction of the canal. The bladder is attached to the uterus below the level of the internal os. Rectal examination, combined with abdominal palpation, detects the degree of flexure and the intimate approximation of the cervix and fundus.

TREATMENT.—The indications are for the removal of the endometritis and the establishment of thorough drainage. Replacement is impossible by the use of the sound or by manipulations, even under ether.

*The Operation.*—The posterior lip is incised through from above

the internal os; the uterus is dilated, curetted, and irrigated. The hemorrhage is free, inasmuch as the circular vessels are cut. To check this, a tight iodoform gauze tamponade is indicated, to be retained in place by vaginal gauze tampons for at least two days. It is then removed and vaginal gauze packing substituted. The treatment lasts for three weeks. With the short vaginæ and structurally altered uteri we cannot see how Alexander's operation or ventro-fixation could possibly be of benefit, and pessaries are worse than useless.

## ACQUIRED RETROFLEXION AND RETROVERSION.

ETIOLOGY. — Retroflexions and retroversions accompanied by tumors will not be described. Their proper treatment is removal of the neoplasms, after which, if they still persist, they are to be dealt with as are other retrodisplacements.

Retroposition of the uterus may ensue as a result of conditions in its own tissues and from lesions in the supporting structures. Any factor tending to enlargement of the uterus, which at the same time softens its walls, may cause retroposition. Such are pregnancy, septic endometritis, and subinvolution. There is so much discrepancy in the relative frequency of retroflexion and retroversion given by different authors that it is impossible to furnish an accurate ratio. Retropositions are frequently found after the adnexa of both sides have been removed without adopting some means to retain the uterus in its proper position.

The cervix being more or less a fixed point, the heavy and softened body falls backward. A very common cause is too long confinement in the dorsal position in bed after labor, especially as the uterus is apt to be, under this circumstance, in a pathological state.

A sudden fall from a height, producing rupture of the round, broad, or utero-sacral ligaments, a sudden increase of the intra-abdominal pressure, as the body being crushed under a weight, may produce retropositions of the uterus by interference with its supports; or, they may be produced by a lesser and more gradual increase in the intra-abdominal pressure, operating for some time upon a softened uterus. But the common association of causes is a break in the pelvic floor, together with uterine enlargement.

The chief single cause is rupture of the perineum. The walls of the collapsed bladder completely fill the space between the

uterus and pubes; therefore displacement forward is possible to but a very slight degree. The perineum being torn, the sphincter ani does not feel the full opposing force of the levator ani in defecation, so more or less straining at stool becomes necessary. The result is that the feces, meeting the closed sphincter, seek a relief from the intra-abdominal pressure in the direction of the posterior vaginal wall, causing it to bulge forward. This drags on the posterior lip of the cervix, the uterine axis approaches that of the vagina, and the whole organ descends a little. If the uterus be enlarged as from a recent pregnancy, it will, yielding to the pressure from above, either fall backward or its fundus will bend upon the cervix, causing a flexion.

FIG. 157.
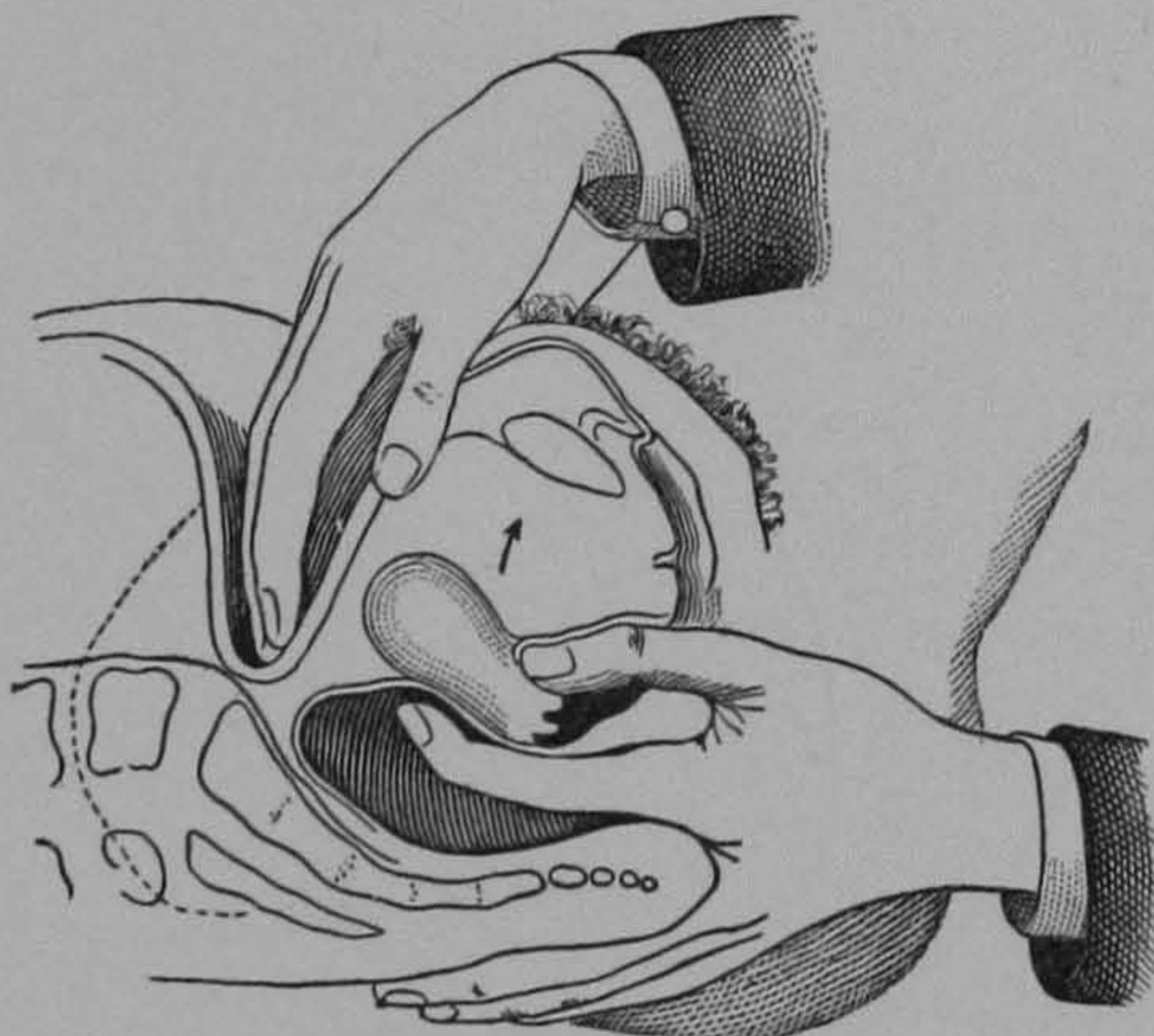


Ventro-recto-vaginal Reduction in Uterine Retrodisplacement.

Retroverted and retroflexed uteri are low in the pelvis, as the anteflexed uteri are high up.

The element of intra-abdominal pressure is operating continuously, and may, apart from defecation, cause the displacements mentioned, where the supports are broken, more especially when there is a lack of tone in the uterine muscle.

Septic conditions, especially those acutely established in an aborting uterus, frequently result in acute retroflexions, which disappear in a few days if the sepsis is removed, and the uterine muscle regains its tone. Pelvic peritonitis and inflammatory processes in the tubes and ovaries also cause retropositions by the formation of false bands. Retroflexion and retroversion are usually accompanied by endometritis. Certain irregular changes take place in the muscularis, such as thinning of the anterior and thickening of the posterior wall. The broad ligaments are twisted and the venous circulation retarded,

leading to a varicose condition of the pampiniform plexus. This in time predisposes to prolapse of the ovaries and tubes. Retroposition is the first step to prolapsus.

SYMPTOMS.—Women with retroversion or retroflexion complain more of backache and a dragging sensation in the pelvis than of any other symptoms. These may be so great as to amount to actual inability to walk. Leucorrhea is a prominent symptom, the endometrial discharge being milky or purulent. As a result, erosions of the cervix may occur. In septic or inflamed uteri every movement

FIG. 158.
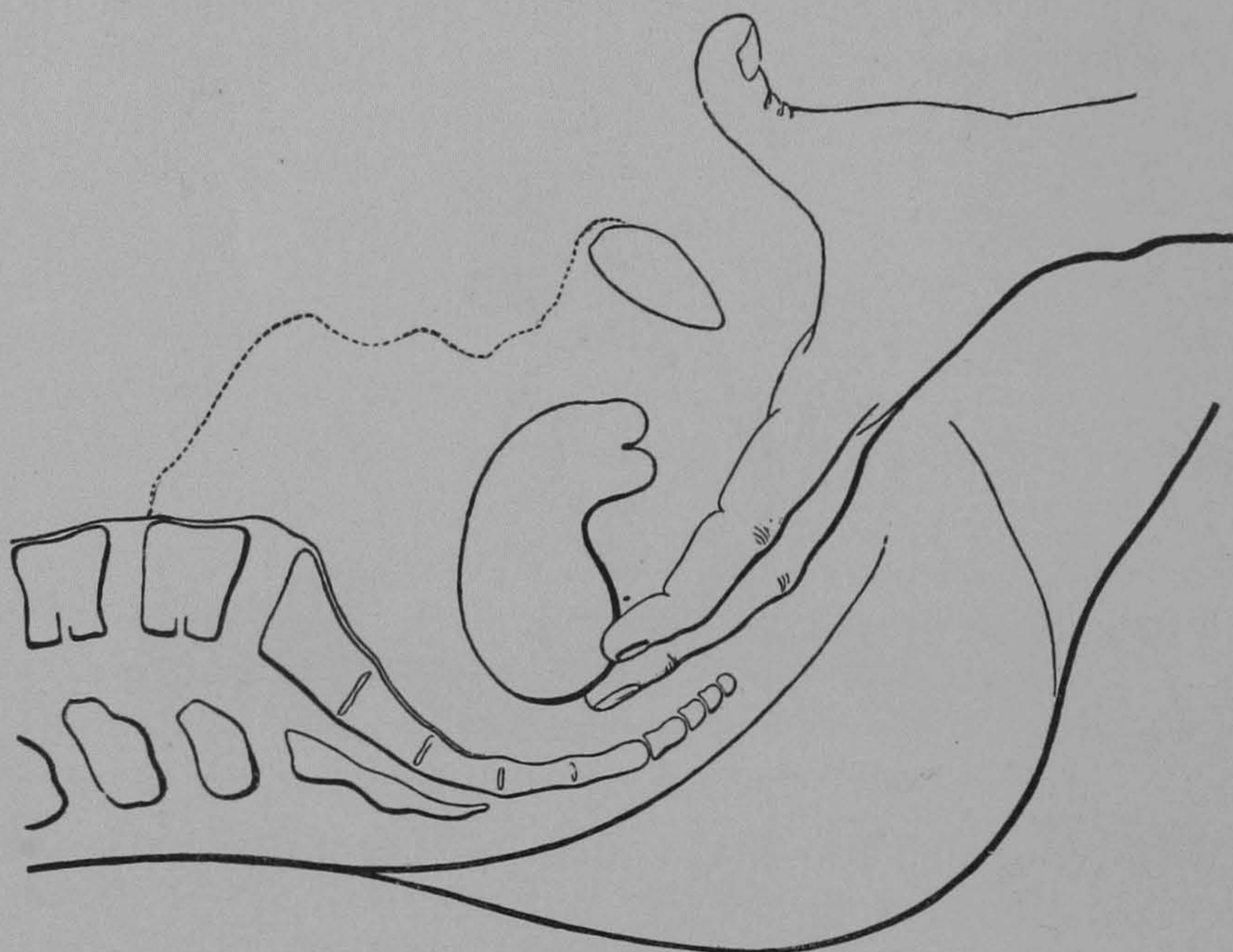


Bimanual Reposition of the Retroflexed Uterus: first step.

is felt in the tender organ. Defecation is difficult and often painful, hence postponed as long as possible. Costiveness results, with the common accompanying train of anorexia, foul breath, etc. Dragging upon the bladder sometimes causes the sphincter vesicæ to leak, and dribbling of urine occurs upon laughing or exertion. Pains down the front of the thighs are frequent, and are increased on motion. Occipital headache and burning pain in the nucha, inability to concentrate the thoughts, melancholia, hysteria, and peevishness are common reflex nervous phenomena. The endometrium commonly becomes hypertrophic, and gives rise to increased menstrual flow.

This, however, is not painful as a rule, owing to the fluid condition of the blood and patency of the canal.

DIAGNOSIS.—Upon examining these cases of posterior displacement, the uterus is found low in the pelvis. If there be pronounced retroversion, the finger first touches the posterior lip of the cervix, and the uterine tissue continues from this point backward and downward. There is absence of the body from its normal position, and rectal touch demonstrates its presence in the cul-de-sac in retroflexion; in retroversion the body presses on the rectum higher up. In aggravated

FIG. 159.
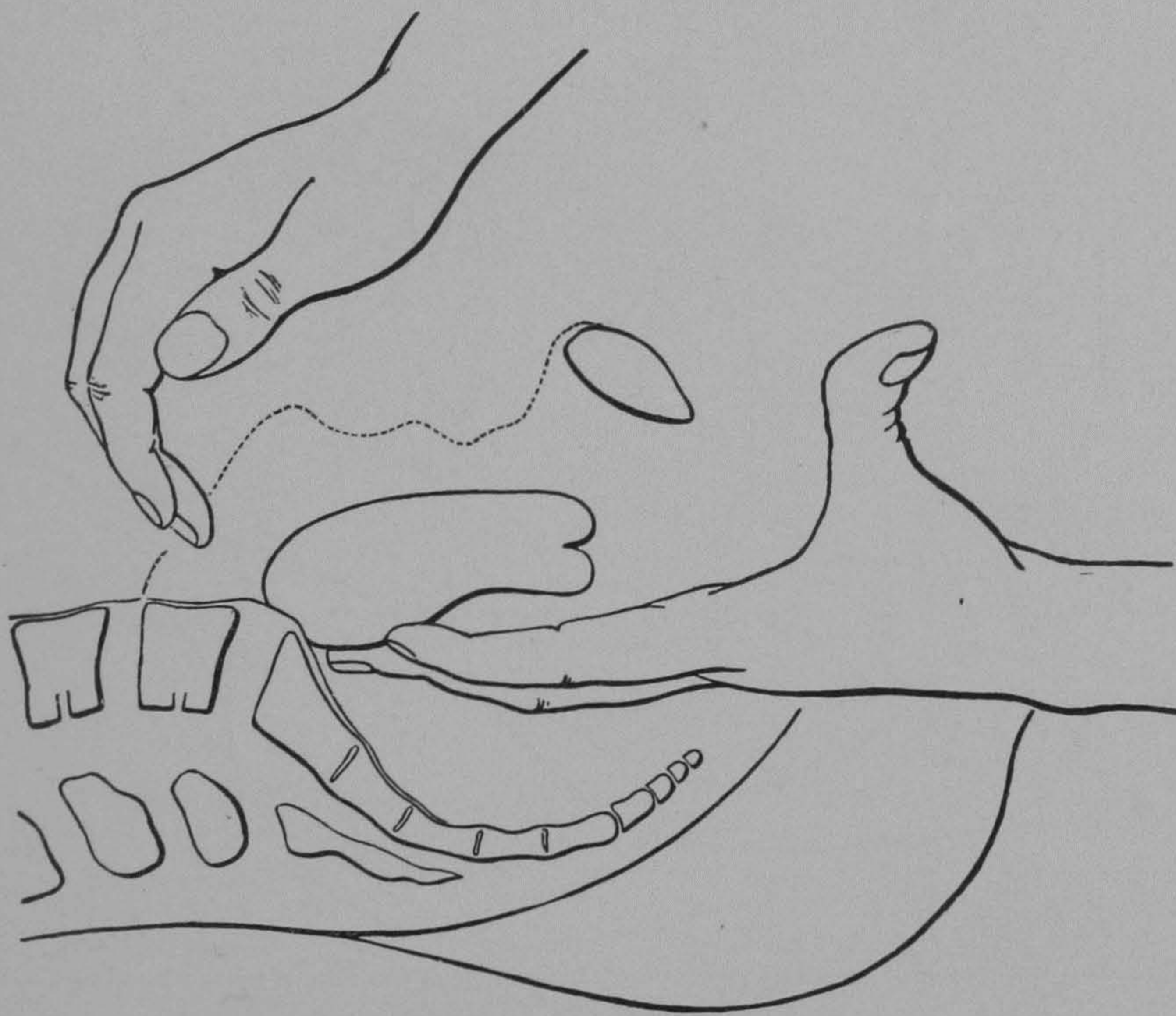


Bimanual Reposition of the Retroflexed Uterus: second step.

cases the ovaries also lie so low as to be felt easily to either side of the uterus. The fundus is tender, and more or less enlarged according as the displacement occurs post-partum or not.

The local tenderness and size, with many of the subjective symptoms, vary greatly according to the causative factors.

Retropositions of the post-partum uterus, or the organ materially softened by endometritis and metritis, have commonly both versions and flexions associated. Therefore one author will describe a certain case as retroflexion, while another places it as retroversion. If

the uterus be flexed to any extent, there will be a convexity on the anterior surface of the organ where normally there should be a concavity, and the reverse on the posterior border. The finger in the rectum, with abdominal palpation, makes the diagnosis absolute, for every portion of the organ can thus be reached. In all cases, when necessary, the sound will demonstrate the direction of the uterine canal. It is a matter of importance to determine whether or not the uterus can be replaced or whether it is adherent to the rectum. Before doing this one should know that there is no suppurative focus in the tubes or ovaries.

FIG. 160.



Bimanual Reposition of the Retroflexed Uterus; elevation of the fundus by the internal hand.

TREATMENT.—Two objects are aimed at—the return of the displaced uterus to its natural position and the cure of any coexisting disease of this organ or its adnexa. One of four methods of replacement may be adopted: replacement by the hands alone, by the knee-chest position, by the sound, or by the repositor.

In thin women only can the uterus be replaced with ease by the unaided hands. In fat women it is often rather difficult, and is then best accomplished by means of the finger in the rectum, or by the knee-chest position. These two methods have great advantage over all others in that they are applicable to cases with septic endo-

metritis, for they do not necessitate invasion of the inside of the uterus. They should be tried faithfully and persistently before resorting to other means. These two methods of replacement are the only ones which give good results. Rare indeed must be the cases in which they fail when properly tried.

*Bimanual Reposition.*—The patient assumes the half-reclining posture, with the knees flexed on the abdomen and the clothes perfectly loose. The finger is introduced into the vagina and passed behind the cervix. The tip is gently bent and attempts are made

FIG. 161.



Bimanual Reposition of the Retroflexed Uterus; the external hand taking charge of the fundus.

to pull the cervix forward toward the symphysis pubis so as to dislodge the fundus from the hollow of the sacrum. The free hand on the abdomen is crowded down hard, following the curve of the sacrum. The object is to keep as far back in the pelvis with this hand as possible, and to pin the retroposed uterus against the symphysis. No attempt has so far been made at reduction—merely the preliminary step of fixing the organ. The vaginal finger is now carried behind the body, which is lifted as high as possible along the curve of the hand pushed into the abdomen, until it is well

in front of the fingers of the free hand.   This is then moved slowly forward toward the pubis until resistance is met with. This maneuvre bends the body of the uterus upon the cervix.

Fig. 162.



Bimanual Reposition of the Retroflexed Uterus, completed.

The vaginal finger is then placed in front of the anterior lip of the cervix, and this is pushed upward and backward to the promontory of the sacrum, while at the same time the body is held anteriorly.   The last movement is to push the cervix suddenly upward in a straight line toward the pelvic brim by the finger beneath the os tincæ.   The uterus is now in an anteverted position. If the cervix is held high in this position while the patient gets up and stands, the intestines will fall behind the uterus and the intraabdominal pressure keep it in place, or if it is intended to fit a supporting pessary, this should now be done while the cervix is held upward and backward.

*Knee-chest Reposition.*—The patient is placed in the knee-chest position and the perineum is lifted up with a Sims speculum. This
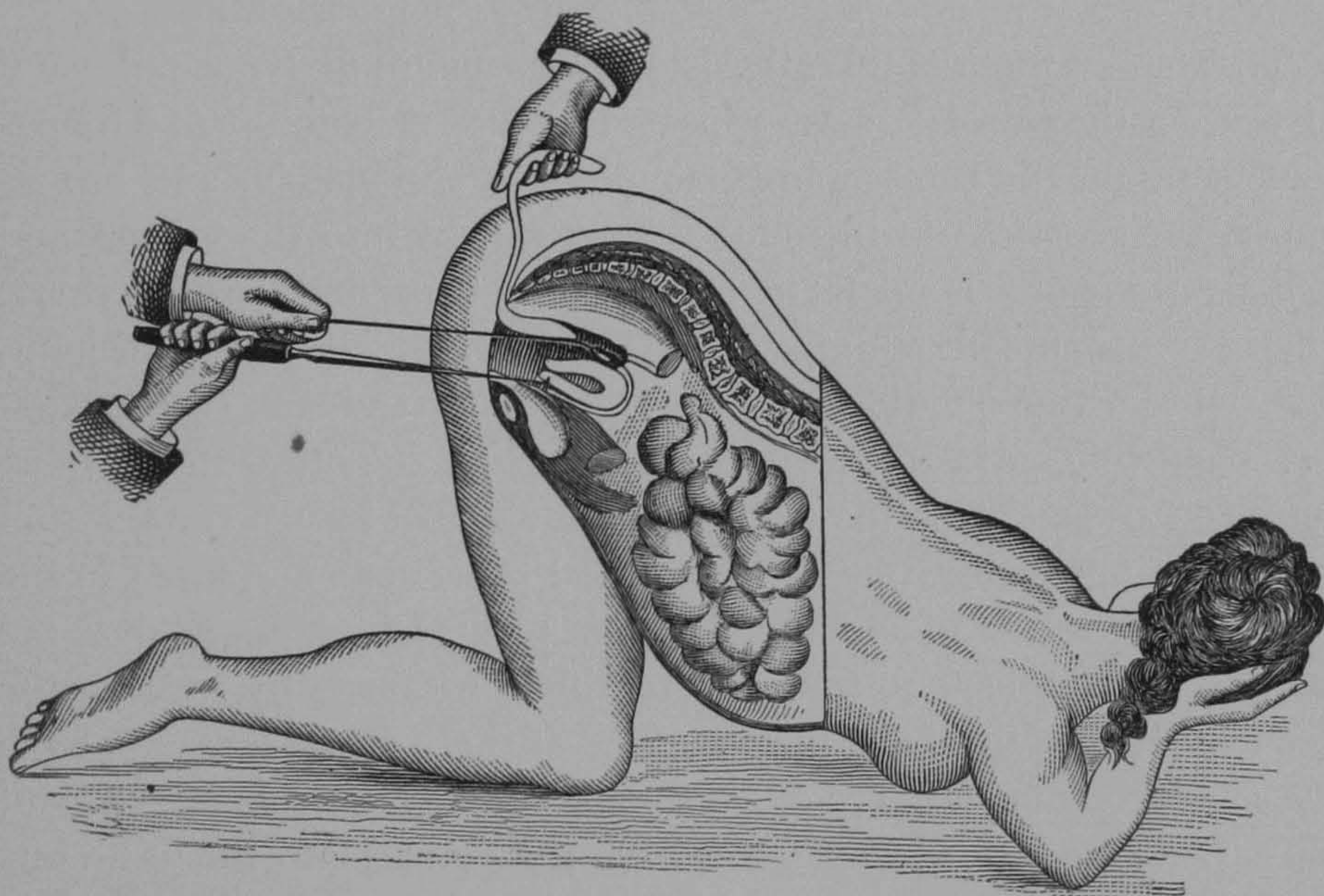
FIG. 163.
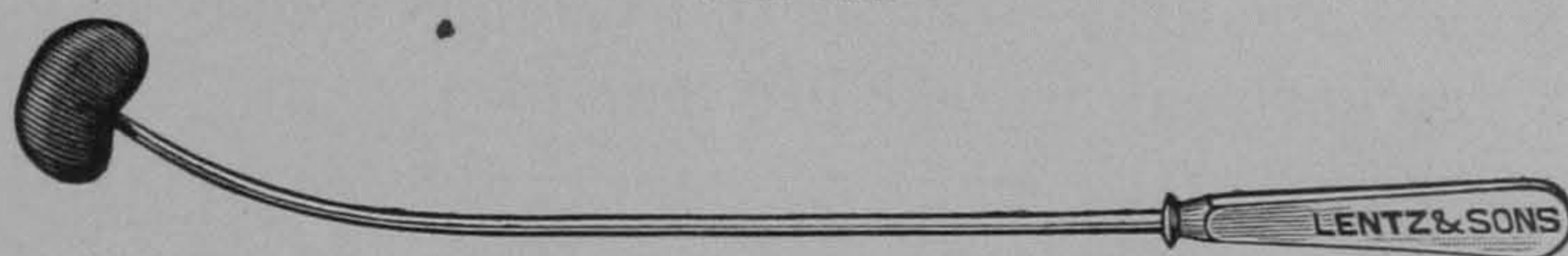


Uterine Repositor.

at once allows the intestines to fall away from the pelvis into the abdominal cavity. The cervix, thus exposed, is caught up with a tenaculum and drawn well forward toward the vulvar orifice. By this movement the fundus is drawn forward sufficiently for it to swing past the promontory of the sacrum, by the aid of gravity,

FIG. 164.



Replacement of Retrodisplaced Uterus by means of the Uterine Repositor, with the patient in the knee-chest position.

which it will do in a small proportion of cases. Should it not do so, as the cervix is drawn forward, the fundus is lightly pressed upon by means of the repositor shown in the cut, and thus forced into place. A firm cotton tampon is then placed anterior to the cervix, and the patient allowed to assume a recumbent position; as she does so the intestines fall back into their normal position, and with the intra-abdominal pressure aid very materially in keeping the uterus forward.

The uterus may be replaced in women who are stout, and in others who are unable to relax the abdominal muscles, by putting them in the knee-chest or dorsal position, and employing combined rectal and abdominal reposition. The manipulation is very similar to that of the bimanual method just described.

*Replacement with the sound* is accomplished by curving the instrument so that it may be introduced, and then causing the instrument to make a half sweep. The whole weight of the organ falls on the point of the sound, which lacerates the endometrium, and has in innumerable cases perforated the uterus. In this maneuvre the organ is not raised as a whole, but the fundus is merely forced into a different relationship to the cervix. If there be any adhesion or other restraint to the raising of the organ, the risk of perforation becomes very great, for there is no escape from whatever force may be used.

The better method in all cases where manipulations fail—and only when they do fail after repeated trials—is as follows : The patient being on the back or in Sims' position the bladder and bowels empty, the *repositor* is introduced very gently into the vagina and locked; the point is made to enter the cervix and engage there, when the instrument is unlocked. This makes a sound with a joint. The stem portion should be only long enough to reach the internal os. Then by gentle and careful manipulation the intra-uterine portion is coaxed to enter the canal until it has just passed the internal os. The proper length has been selected previously and fitted to the hinge. The finger of one hand is then pushed high up against the back of the fundus, and attempts to lift it are made by turning the screw in the handle of the instrument. If there be no adhesions, the uterus will become anteverted, and, more, it will be made, cervix and body, to assume the normal position in the pelvis ; and this is an important property not attaching to the use of the sound. The instru-

Fig. 165.
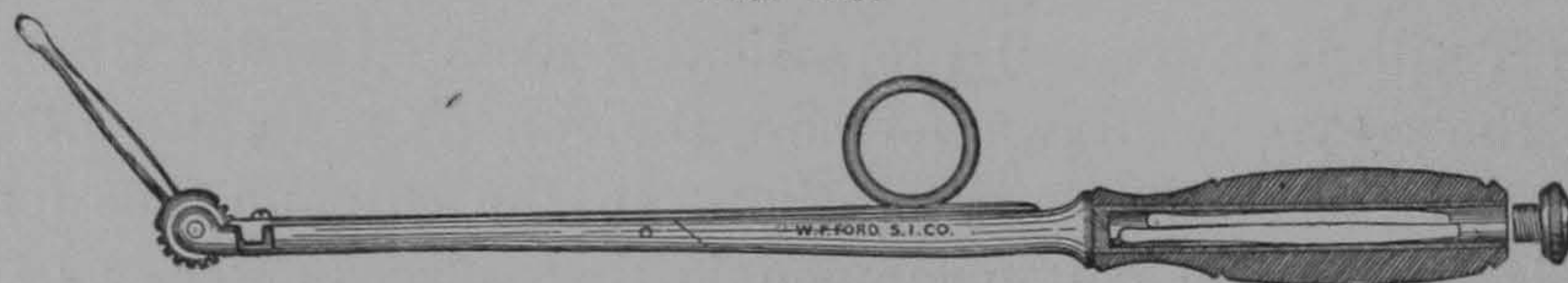


Sims-Pryor Uterine Repositor.

ment is removed, still unlocked, by supporting the cervix with one finger against it and using the symphysis as a fulcrum to slip the staff out of the uterus. If there be intimate adhesions between the

fundus and rectum, the efforts to replace the organ will merely drag up the bowel for a short distance, and with the finger in the rectum, the anterior rectal wall will be felt to leave the finger while such effort is being made. Or, should the adhesions be of some length, the organ will be replaced to a certain extent only, and then checked by the false bands. We are perfectly aware that there is risk attached to this maneuvre, but with our present method of cleansing the operator, vagina, and instrument this is reduced to a minimum. We do not consider that any more danger attaches to its use than to that of the sound.

If it be desired to support the uterus by tampons after replacing it and removing the repositor, the patient should be in Sims' posture. It will then be much easier to replace the organ, as the introduction of the speculum allows the intestines to gravitate away from the uterus. A glance at Waldeyer's plate demonstrates the manner in which this reposition takes place. Were the uterus retroverted and the bladder entirely empty, elevating it in the axis

FIG. 166.



Girl Aged Thirteen, Frozen Section, showing direction of intra-abdominal pressure; relations of uterus before puberty; and great strength of pubic segment of pelvic floor.

of the vagina to a point near the sacral promontory would inevitably result in the fundus being dragged forward by the bladder and associated tissues.

19

This could all be accomplished with the finger against the cervix were the finger long enough. The stem is merely for the purpose of affording a hold on the cervix. By observing even the ordinary rules governing all intra-uterine manipulations there is not much danger attending the use of this instrument. It elevates and replaces the uterus merely by following back the path in which the displacement came. It takes advantage of the anatomy, and does not act against it. The weight of the organ is borne on the whole length of the stem in the cervix, and not on one point, as in

FIG. 167.
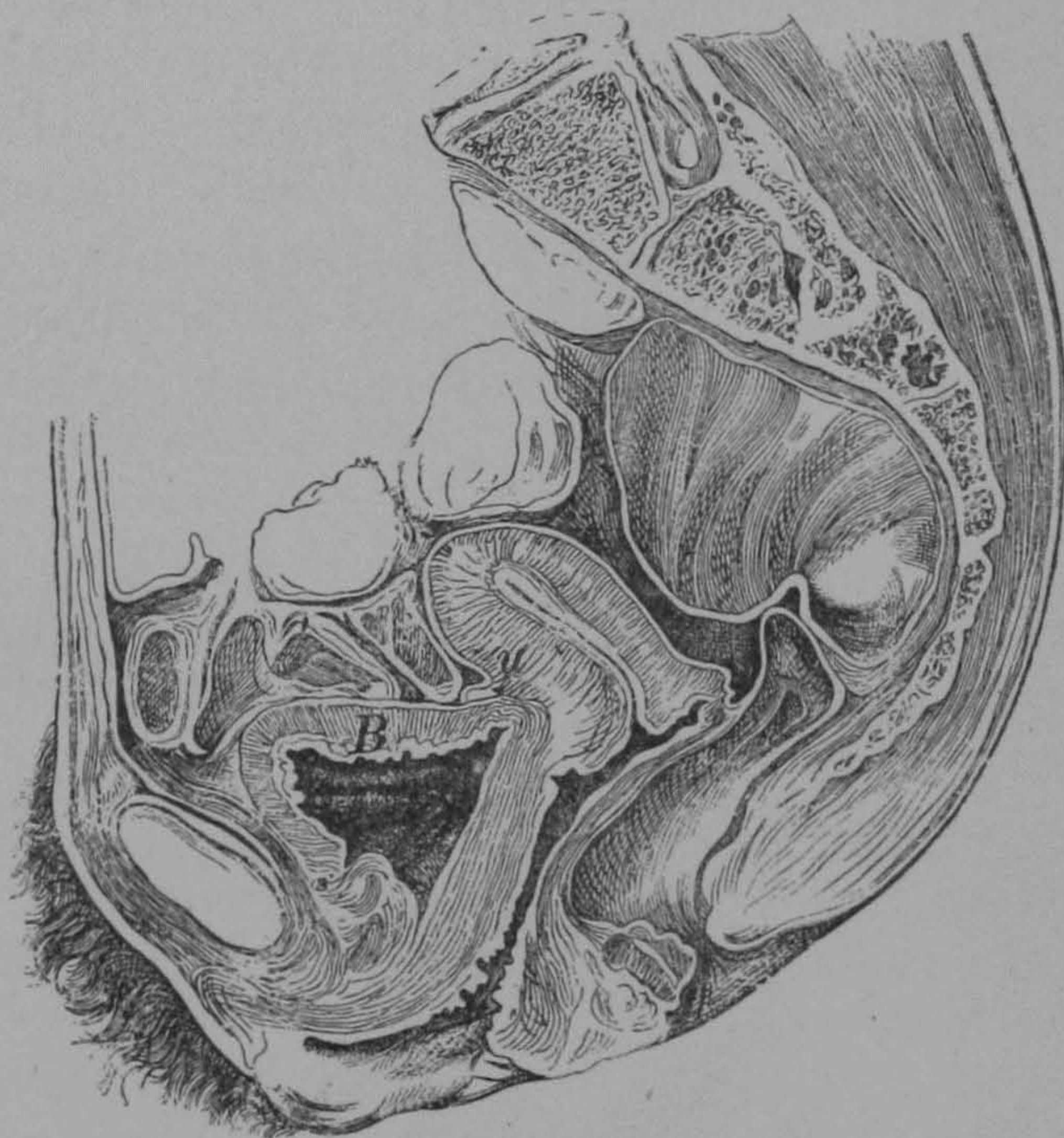
Waldeyer's Frozen Section of the Female Pelvis; *u*, uterus; *B*, bladder.

the use of the sound. With it the exact degree of mobility may be appreciated. But it is *not* to be used where there are pathological conditions in the adnexa, or septic endometritis, and therefore must have a very limited application. Its use as a means of diagnosis of pelvic neoplasms cannot too strongly be condemned. It should be employed only in those cases of free retroposition where there is no septic focus in the uterus, peritoneum, tubes, or ovaries. This cannot too strongly be insisted upon.

Again, we repeat, this method is to be used only when manipulation fails or is impossible, but is always to be preferred to the

reposition by the sound. Both are to be considered only as last resorts.

As a matter of fact, no attempt should ever be made to forcibly replace or otherwise interfere with a uterus which is bound in its displaced position by adhesions. It is impossible to determine accurately whether or not there is disease in the uterine appendages in many cases, and irretrievable damage may unwittingly be done in the manipulations. The only safe and intelligent operations for these conditions are intra-abdominal.

Comparatively few retro-displacements exist without some complicating inflammatory trouble, either intra-uterine or intra-abdom-

FIG. 168.
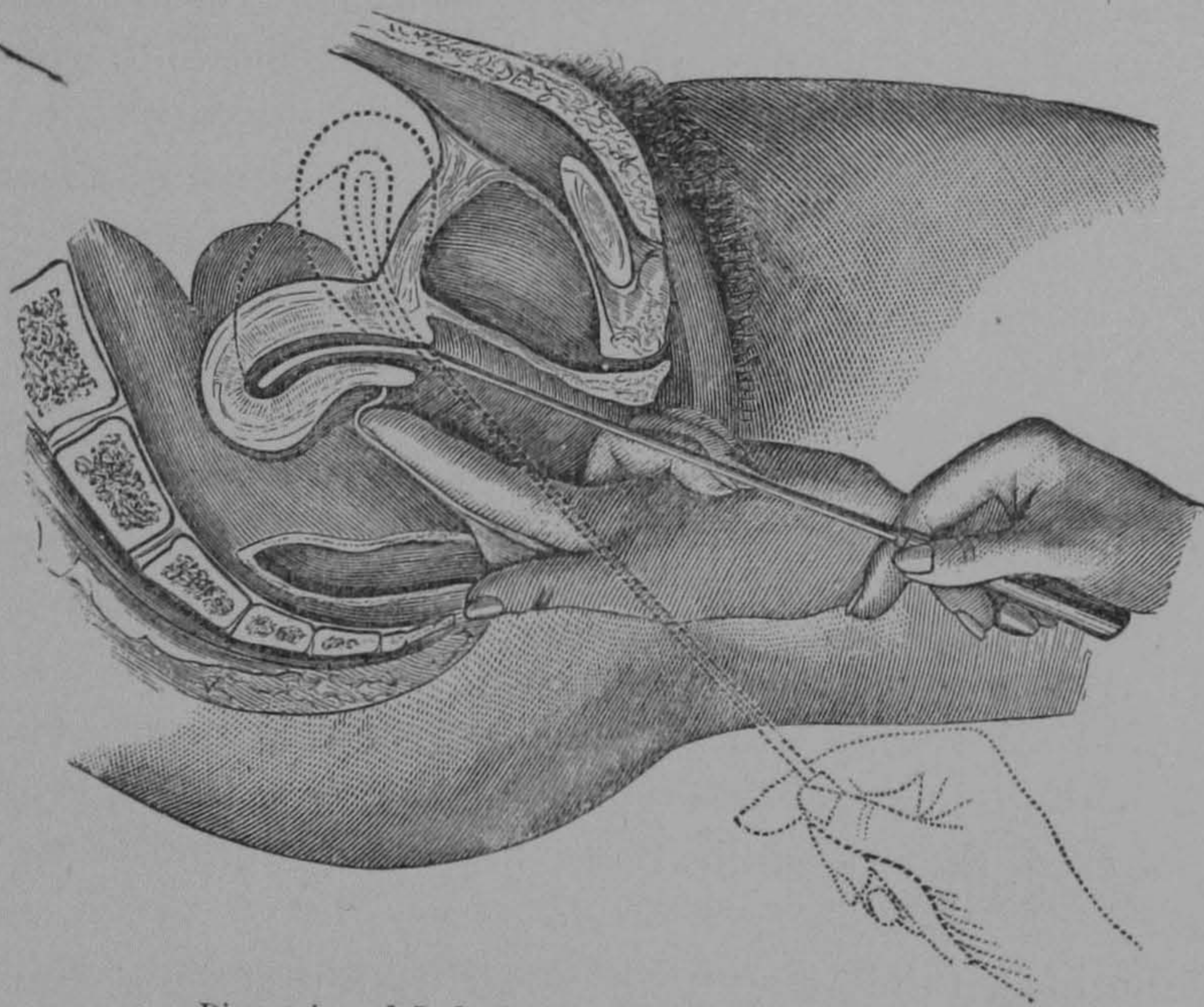


Diagnosis and Reduction of Retroflexion by the Sound.

inal, and the symptoms usually arise from the complications and not from the displacement. It is all the more necessary, therefore, to be on one's guard in selecting proper cases for this treatment.

A uterus may be caught between rigid utero-sacral ligaments, and be so tender as to convey the impression that it is adherent. The question of mobility or fixity in a doubtful case can always be definitely settled under narcosis. No apparently fixed uterus should be treated as such until attempts at replacement have been made while the woman is unconscious.

The object of all treatment must be to have the uterus approach

the normal in size and character of its walls, and to place the supporting agents in a healthy condition. Therefore, if the uterus be retroposed and enlarged, it is essential that it be supported in the proper position while such means are employed as will reduce its size. After the uterus has been replaced in such cases it is kept in position by placing in the cul-de-sac a cotton tampon soaked in some depleting agent, as boro-glyceride or ichthyol-glycerin, and then introducing a tampon of lamb's wool. This latter should be put in lengthwise, rolled hard, and turned sideways, so that the ends will rest against the inferior pubic rami and the tampon be in front of the cervix. When the patient stands the downward motion of the cervix is retarded, and intra-abdominal pressure forces the corpus on the bladder. Combined with this, intra-uterine injections of tincture of iodine are to be used in cases not infected and where the uterus is enlarged. The uterus being elevated, its circulation is improved; being in proper position, drainage is secured; and the astringent intra-uterine and depleting hot-water vaginal injections tend to a reduction in size. It is well to remember that a large percentage of cases of retroposition give rise to no symptoms whatever, and are discovered only upon the supervention of some complication.

When endometritis or pelvic inflammation complicates the displacement, it is to be treated as set forth in its respective chapter. All such complications must be most carefully attended to if successful results are expected. Of those cases of retrodisplacement giving rise to serious symptoms the larger proportion are caused by these complications, and not by the displacement per se.

Having placed the organ in the proper position and condition, if there be tears in the pelvic floor they must be repaired. Nothing tends to the production of the displacement more than costiveness and straining at stool while the woman is still puerperal. Therefore in all cases where the perineum is torn it is better to give a softening enema each day, rather than allow her to strain at stool and occasion a rectocele. Certain cases of retroposition are symptomatically relieved upon the establishment of thorough drainage, and commonly the attendant endometritis is cured.

Artificial supports, as pessaries, are contraindicated until the uterus returns to a healthy condition and all lacerations conducing to displacement are repaired. When that is done, we will find

in most cases that pessaries are not needed. The tampon acts so much better in the majority of cases where any such support is called for that the pessary is falling more and more into disuse. The tampon has none of the dangers attendant upon the use of the pessary, and is even more effective.

Retroversion without enlargement, such as we find in the unmarried, is exceedingly difficult to treat. Here one of three things must be done : either fit a pessary, or perform Alexander's operation, or hysterorrhaphy.

If it is decided to *fit a pessary*, this should be done only after the uterus is replaced. It is presumed that the integrity of the pelvic floor has been made or is perfect. Therefore the apparent vaginal space while patients are on the back is not the actual when they are standing. So it is that a pessary which seems to be loose while the patient lies down becomes too tight as soon as she assumes the upright position, because of the contraction of the pelvic muscles to support the organs against the intra-abdominal pressure. While the pessary is in situ, the finger should pass all around it with ease. Pessaries act, not by supporting the corpus, but by pushing the cervix up away from the symphysis and pelvic floor, thereby enabling the bladder and the weight of the intestines to drag forward and retain the corpus. It would be unfortunate could a pessary be applied so that it extended up into the cul-de-sac higher than the internal os : ulceration of the vagina would be inevitable. Fortunately, unless the pessary be excessively long, this is impossible of accomplishment.

The soft-rubber ring, or the Smith-Hodge pessary of hard rubber, is preferable to all others. The Smith-Hodge pessary may be softened and bent into any shape by immersion in boiling water.

If the pessary produces the least pain, it should be removed by the patient at once. And it is positively contraindicated where there is any disease of the adnexa, septic endometritis, urethritis, vaginitis, lacerated perineum, cystitis, adhesions, and whenever the uterus bends back over the instrument. Not often, then, can pessaries be employed with advantage. They are of most service in cases of displacement following labor or from any other acute cause.

Pessaries should be introduced as follows :

The patient is placed on the back and the uterus replaced. It

is essential that the bladder and bowel be empty. The labia are separated by the fingers of the left hand. The index finger of the
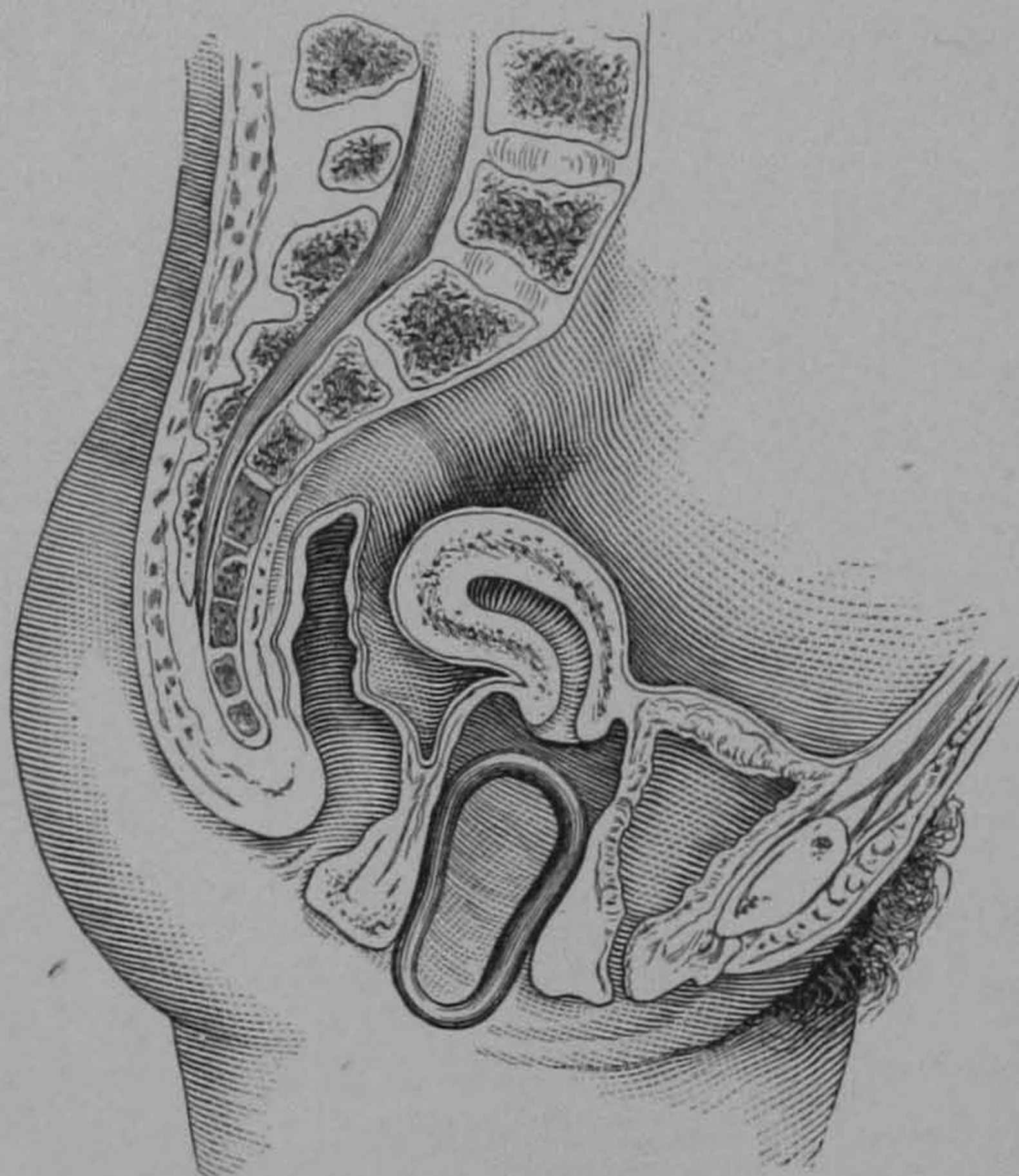
FIG. 169.
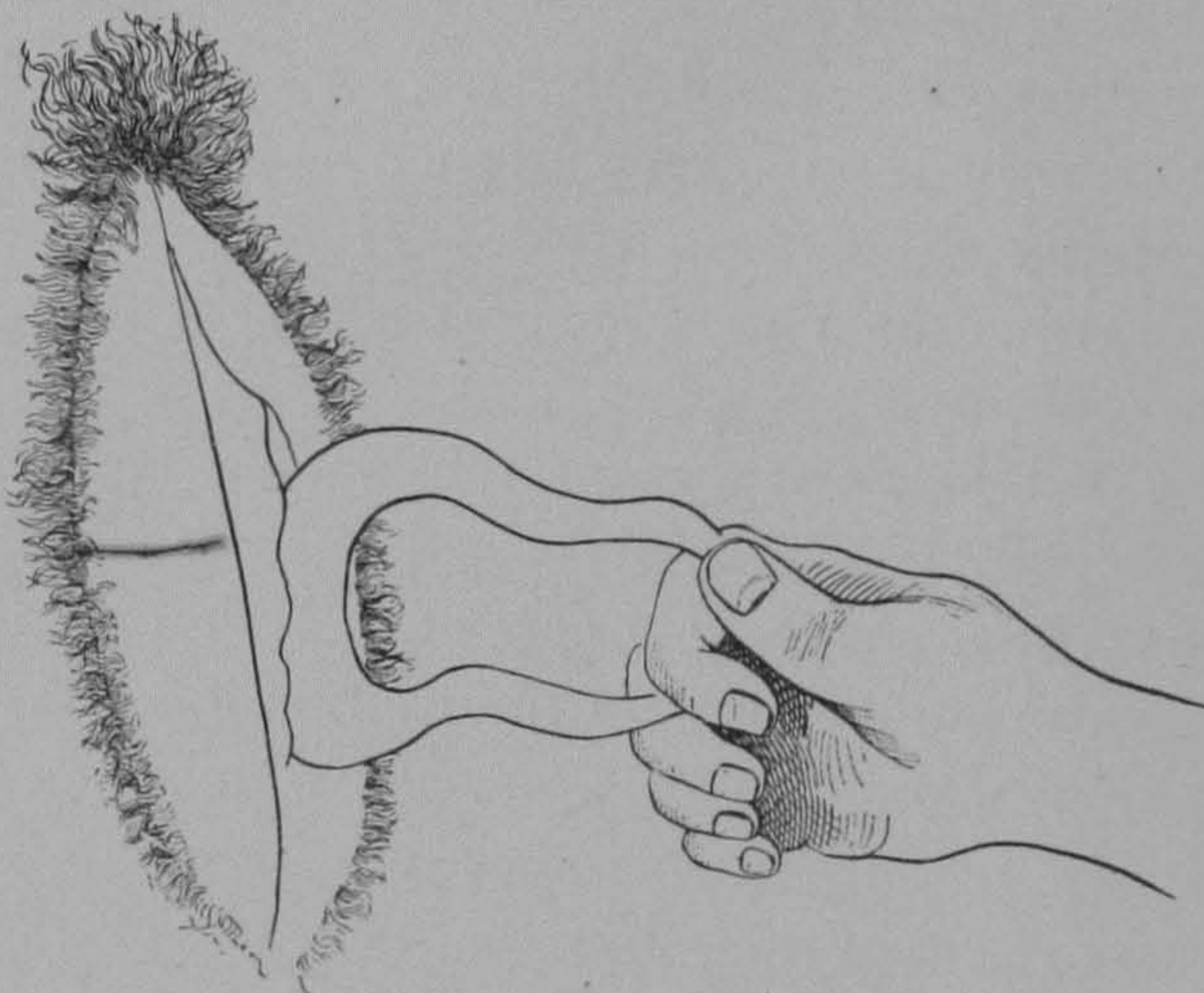


Introduction of Pessary, first stage.

right hand holds the well-greased pessary, the thumb and middle finger steadying it. The broad end of the pessary is introduced
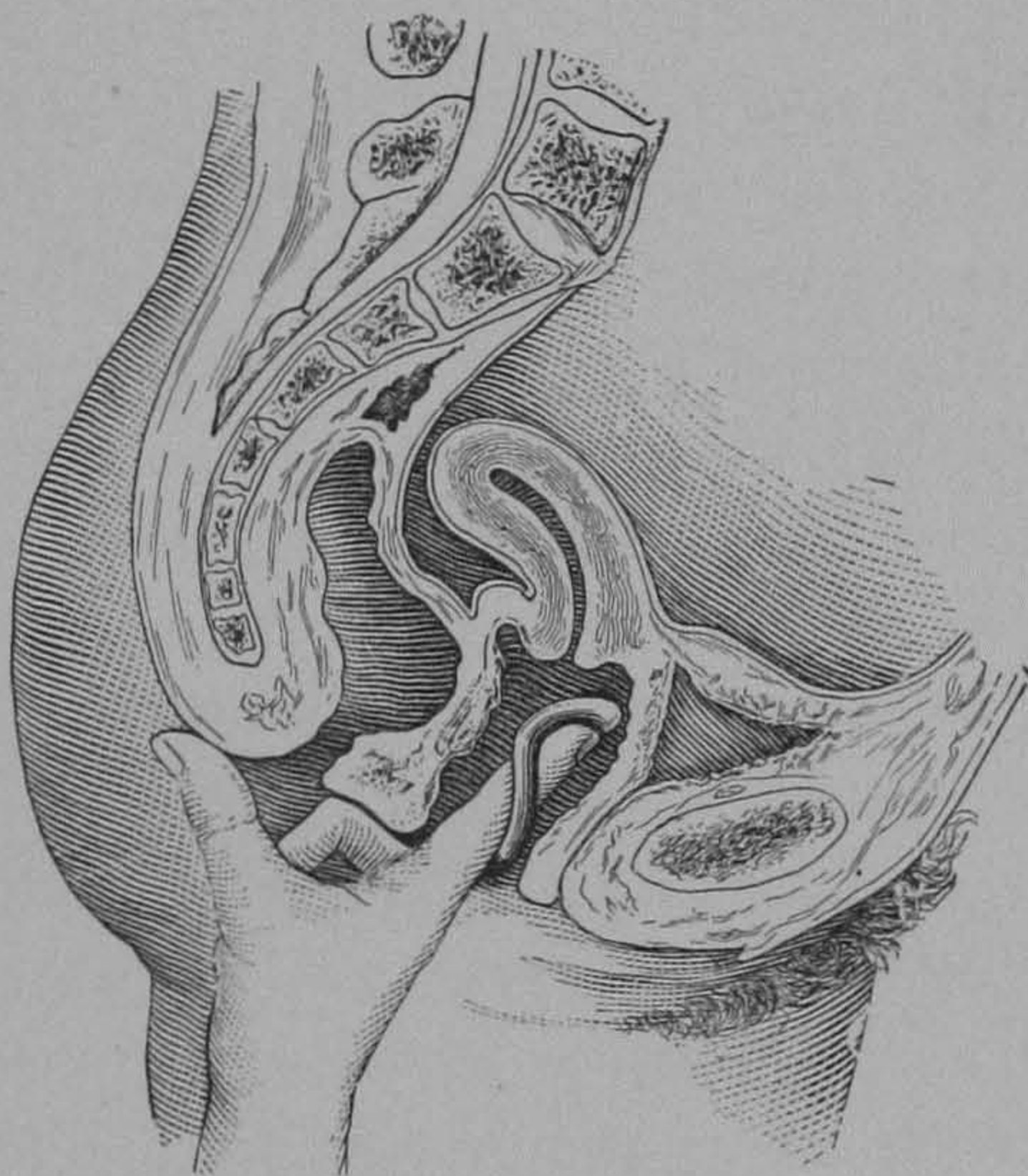
FIG. 170.



Introduction of Pessary, second stage.

with one side under the pubes and obliquely, so as not to press upon the urethra. As the advancing bar of the pessary passes the vulva

the hand holding it is carried high in front of the pubes, so that the pessary may be inserted in the curve of the pelvic outlet.  As the
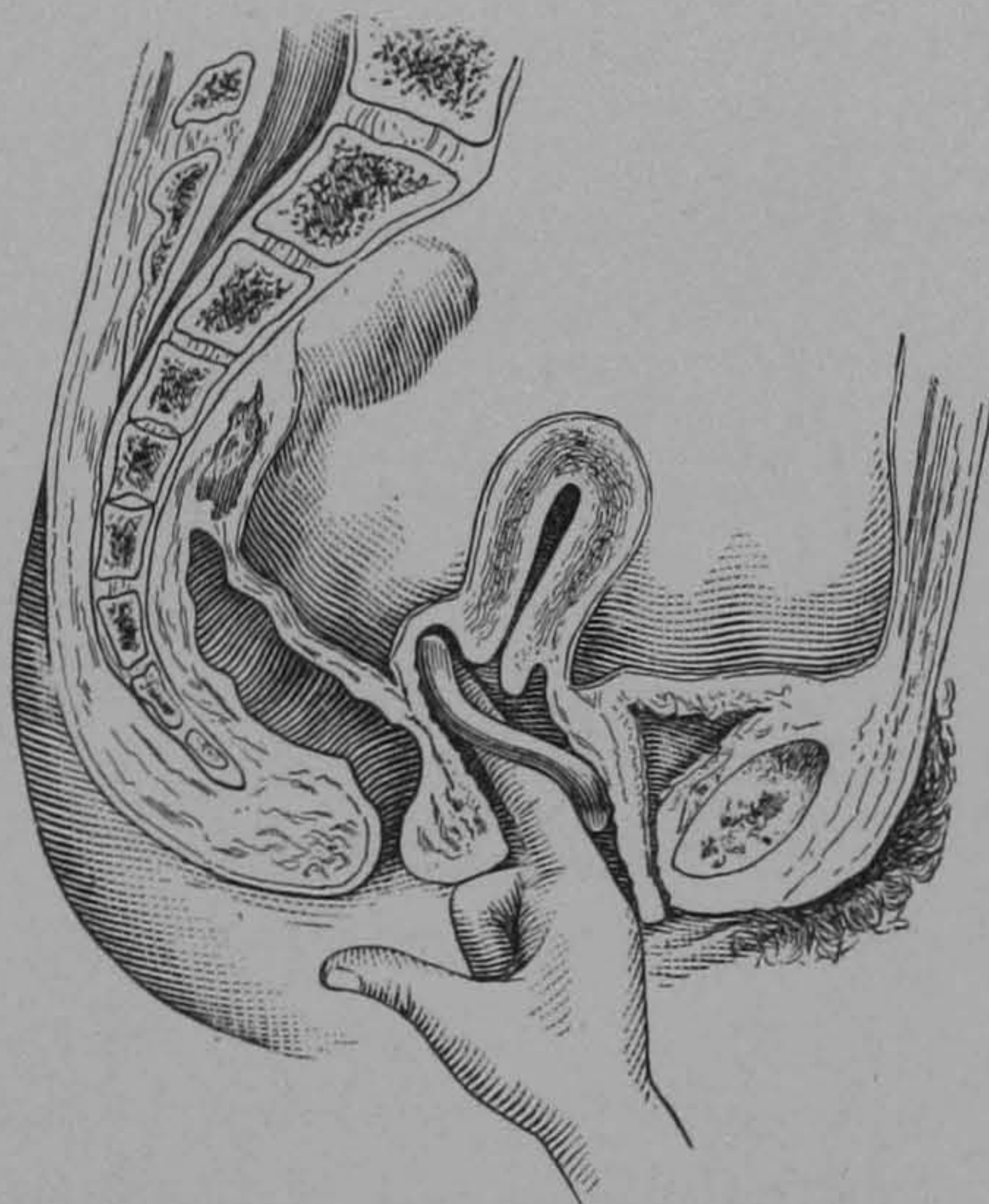
Fig. 171.



Introduction of Pessary, third stage.

pessary advances it is rotated until it lies on its flat side on the floor of the vagina.  When it has entered the vagina so as to reach the

Fig. 172.



Introduction of Pessary, fourth stage.

cervix, the index finger of the right hand is passed into the vagina under the anterior bar of the pessary, until it reaches the posterior

end, over which it is hooked, pressing the bar downward and back-ward, thus guiding it into place behind the cervix. The point of the pessary should not press upon the neck of the bladder or the urethra, but it should be curved downward, so as to take support from the converging pubic rami, thus leaving a space between the arms of the point for the urethra. Again, the base should not be so curved as to press against the ischial rami below. A fairly good test is to pass the finger all around the pessary while the woman is on her back. If that may be done, when she stands and the muscles of the floor of the pelvis contract, the pessary will be snug enough.

Pessaries should not cause the least pain, and patients should not know that they are wearing them except by the relief of disagreeable symptoms. Those pessaries having rings into which the cervix fits are objectionable, in that the cervix settles down into the ring so snugly as to obstruct the egress to its secretions.

Stem pessaries with a bow attachment are dangerous affairs, even more so than stems alone.

Pessaries which fasten to belts outside the body are not to be used, except in cases of complete prolapse where the patient refuses all surgical treatment. Under these circumstances they are often of great value.

FIG. 173.
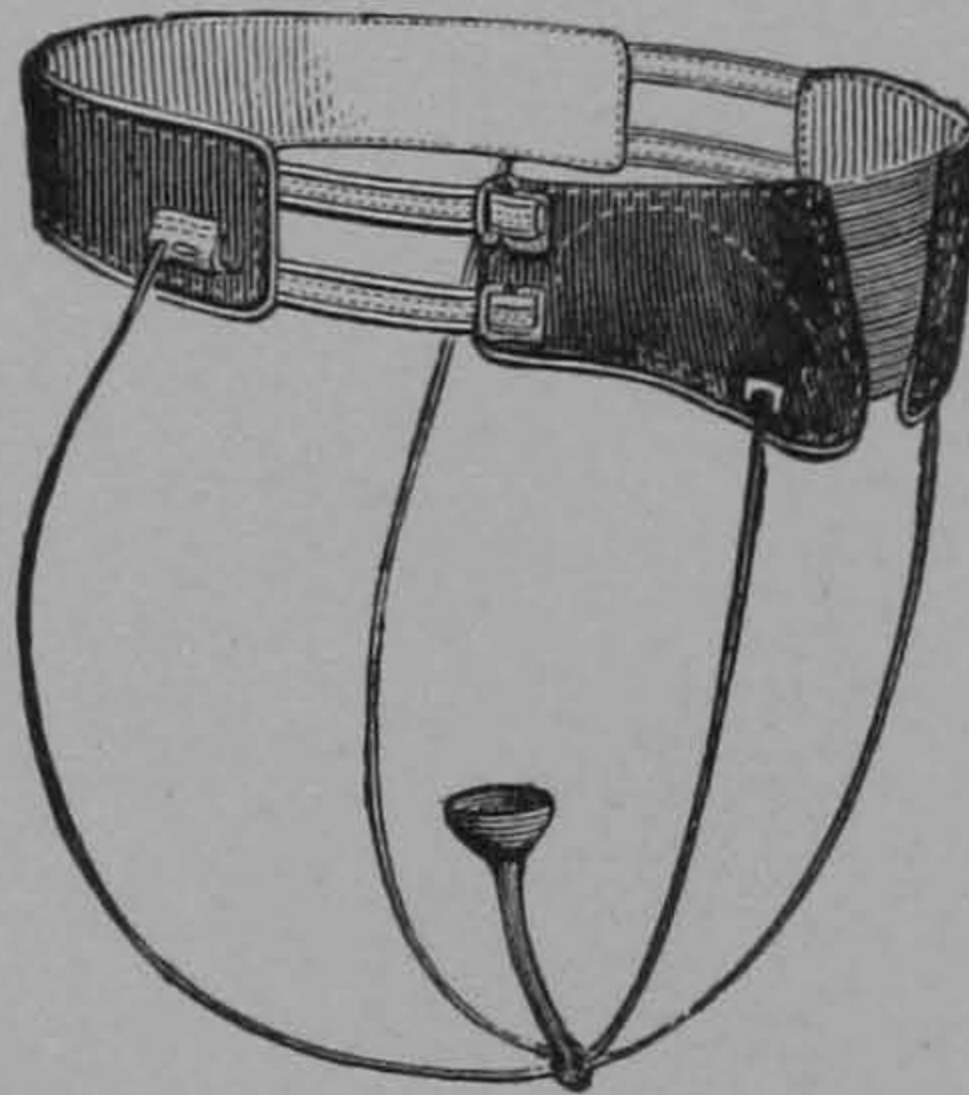


Pessary for Complete Prolapse.

Even in cases temporarily benefited by the use of pessaries the questions must arise: How long can the patient wear one? Do they ever cure, and are they not merely unsatisfactory makeshifts? In cases in which they appear of use, are there not better methods? It is far better for the patient to go twice a week to the phy-sician for the introduction of a supporting tampon of sterilized

wool if it can be retained than to wear a pessary, even under observation.

Granted that the uterus has been gotten into a normal condition and all lacerations of the pelvic floor are properly repaired, it is occasionally necessary to use pessaries.

Patients who use pessaries should take daily cleansing douches, and have the supporter removed once a month, cleansed, and allowed to remain out for twenty-four hours before being replaced.
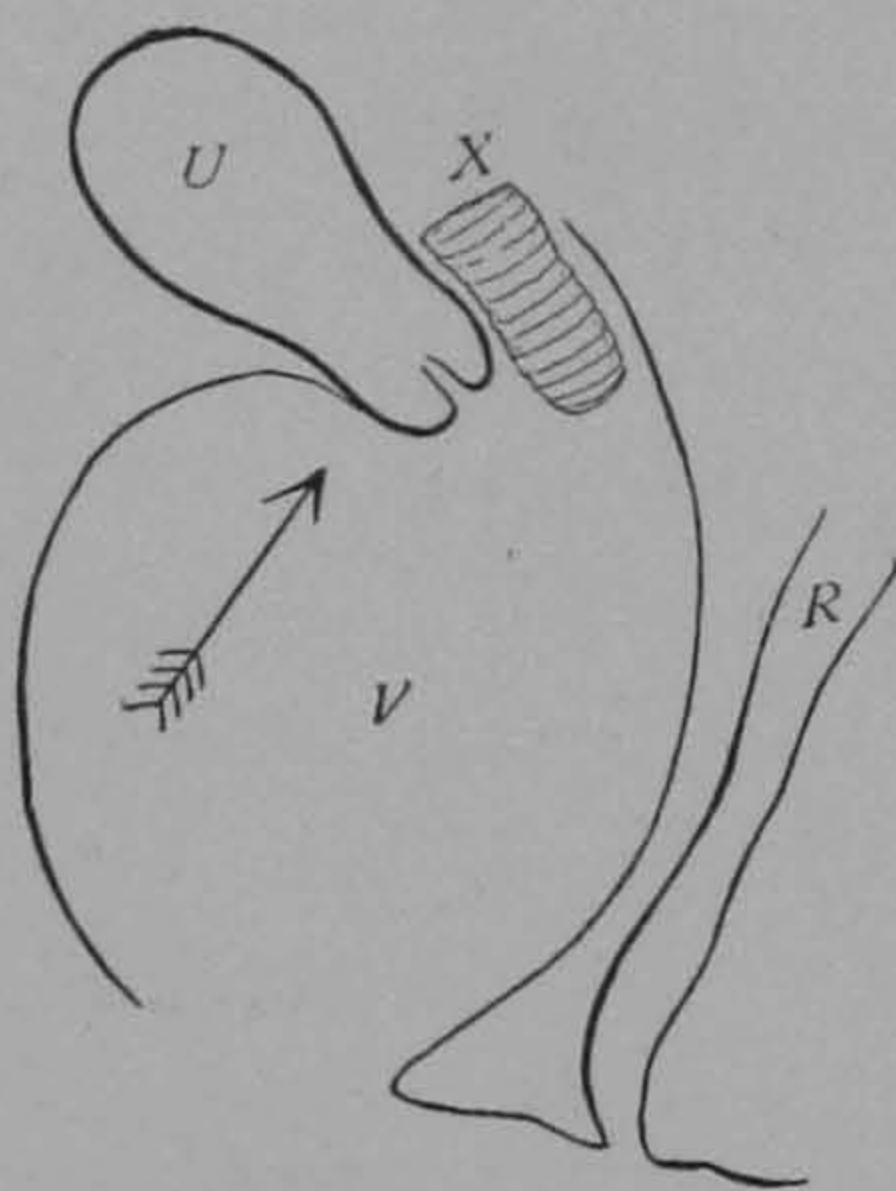
*Surgical treatment* of retro-displacements has for its object the replacement of the womb in its proper position and the cure of the complicating disorders. It is divided into two classes: those operations performed through the vagina, and those through an abdominal incision.

Experience has taught that with one possible exception—posterior vaginal section as proposed by Pryor—the results of all the vaginal operations for the purpose of replacing the uterus which necessitate an incision of the vaginal vault, either anterior or posterior, are fraught with so much future danger to a woman in the childbearing period that they need only be mentioned to be condemned.

*Posterior Vaginal Section.*—The patient is placed in the lithotomy posture. The uterus is curetted and irrigated, but not packed. Pulling the cervix down, the operator cannot readily determine the point of reflection of the vagina from the cervix; but upon pushing up the cervix he will see a prominent crescentic fold form just behind the cervix. This is incised with blunt scissors for a distance of about one inch. The cut extends through the vaginal mucous membrane only, and at the sides stops short of the middle line. But one layer now remains to be severed—viz. the peritoneum. The anatomical fact must be borne in mind that sometimes the peritoneum is reflected from the rectum to the uterus at a point opposite the internal os, and in other cases it dips deep down behind the posterior vaginal wall. Therefore it is safer to not at once cut through the tissues lying beneath the vaginal incision, but to insert one finger and shove it up to the level of the internal os, while down-traction upon the uterus is maintained. If the finger has not penetrated to the pelvic cavity by this maneuvre, the pocket formed by the finger is wiped dry and the cavity inspected. The peritoneum will be seen bulging out into the incision at each movement of the diaphragm. Where the peritoneum is attached to the uterus it is seized with mouse-toothed forceps and carefully divided with scis-

sors. Inserting one finger into the opening, the operator makes a
thorough digital examination of the pelvic contents. Slight adhe-
·sions are readily broken up. If dense or extensive adhesions exist,
the case is more properly one for hysterorrhaphy. If satisfied that
all adhesions have been severed and that the adnexa are free from
disease, the operator wipes the pelvic cavity dry. The nurse has
prepared a roll of iodoform gauze to which is attached a stout silk
cord, and this the operator places just within the cut edges of the
peritoneum. This roll of gauze should fit the incision snugly, and
should not be so long as to project up above the level of the internal
os, or project so far into the vagina as to be shoved up into the pel-
vis by the patient's movements. The uterus is now packed with
iodoform ganze. Having properly placed this roll of gauze, the
cervix, with the gauze still in place, is shoved upward and backward
in the axis of the vagina until the vaginal walls are straightened
out and the corpus uteri is manipulated into anteversion. While
holding the cervix high up by means of the long retractor the ope-
rator places wads of gauze in front of and to each side of the cervix,
so as to maintain the cervix in a backward
and upward position (Fig. 174). This will
necessitate packing the vagina very snugly,
sufficiently so as to encroach upon the
bladdder-space in front and rectal space
behind. A good deal of dexterity is re-
quired to properly place the roll of gauze, to
replace the uterus, and to maintain it in an
anteverted position by means of the vaginal
packing. A permanent catheter is inserted
into the bladder and the sphincter ani dilated.
In forty-eight hours enough vaginal packing
is taken out to enable the operator to remove
the uterine packing. This latter is not re-
placed, but the vagina is again packed as
nearly as possible as at first. The self-retain-
ing catheter is removed after washing out the
bladder with boric-acid solution. In seven

FIG 174.



U, uterus; V, vagina; R, rec-
tum; X, wad of gauze. The
cul-de-sac has been opened, the
uterus replaced, and the wad of
gauze placed in the incision.
The vagina is distended with
gauze, which is not shown, but
the direction of effort of the vag-
inal gauze is indicated by the
arrow.

to ten days the patient is placed in Sims' position and given chloro-
form. All the vaginal gauze and the gauze roll in the cul-de-sac
are removed. Another loose plug of gauze is inserted into the cul-
de-sac opening and the vagina again tamponed with gauze. The

second dressing will not require narcosis, and is made six days after the first. Thereafter the dressings are made as soon as they appear wet with the broken-down lymph and serum from the peritoneal surfaces. Throughout the entire treatment the cervix uteri must be kept in its position either by a full vaginal packing of gauze or by placing in front of the cervix a roll of gauze placed transversely, its ends resting against the lateral vaginal walls. The patient is usually allowed out of bed after the second dressing or in about two weeks. Little or no pain is produced by the operation, and hence no morphia is indicated. The object of this operation is to produce a mass of adhesions between the cervix, meso-rectum and utero-sacral ligaments. This anchors the cervix high and back, allowing of the freest movement of the corpus uteri. So long as this scar-tissue remains the uterus will be maintained in an anteverted position through the intra-abdominal pressure acting upon the body of the uterus. And, inasmuch as the new union between the cervix and utero-sacral ligaments is underneath the promontory of the sacrum, there is little tendency for it to break away; for the cervix is protected against the direct influence of the abdominal pressure.

In the course of time the mass of lymph which forms behind the cervix becomes organized into suspending bands. During this lymph-formation there is neither temperature nor infection.

It may be said of this operation that it supposes cutting but two anatomical layers—vaginal mucosa and peritoneum. There are no vessels to ligate, and no sutures to apply.

All cases of fixed retroposition in which there is pus-formation in tube, ovary, or broad ligament distinctly contraindicate this operation.

Of the operations through abdominal incisions for the correction of retro-displaced uteri but two have stood the test of experience—Alexander's operation and hysterorrhaphy. The operations devised by Wylie, Baer, and Dudley, having for their object the intra-abdominal shortening of the round ligaments, give promise of future usefulness.

*Wylie or Baer's Operation.*—The abdomen being opened, the inner side of the round ligaments are scraped, so as to make their surfaces raw; then, around a fold of each, three silk ligatures are passed, so as to include most of the ligament and fold the raw peri-

toneal surfaces on each other. The ligaments are thus shortened, the folds being external.
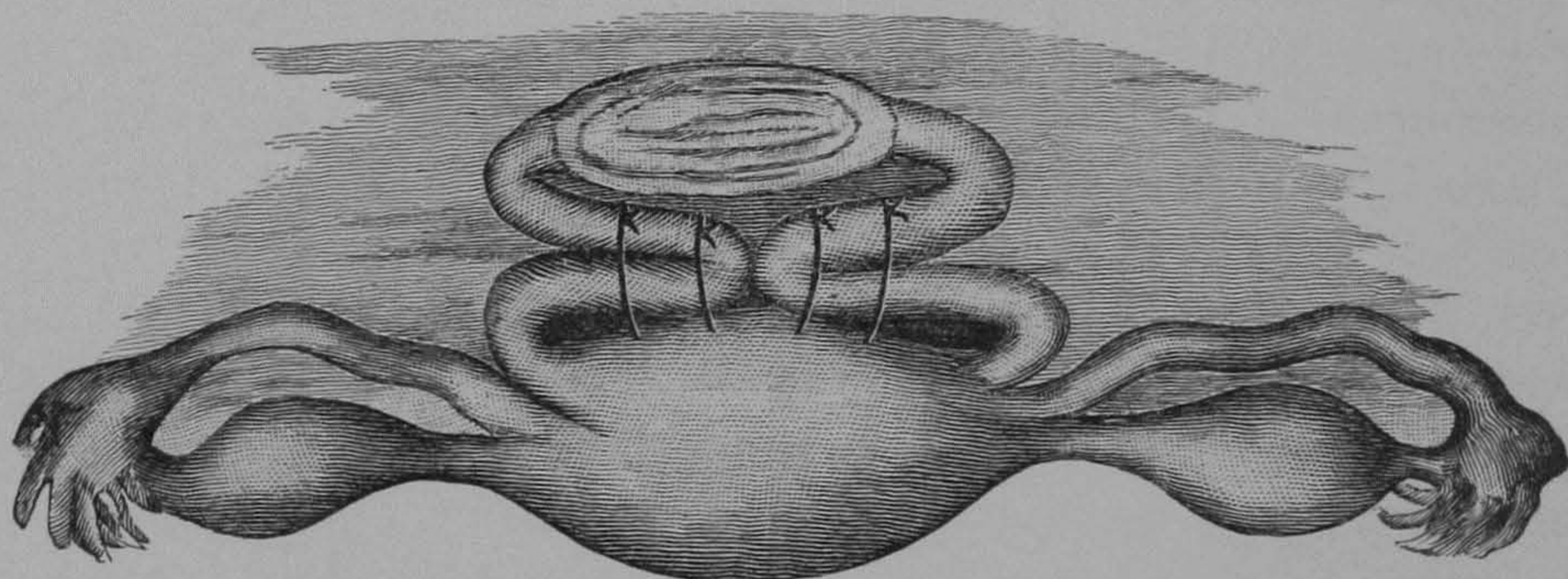
Fig. 175.
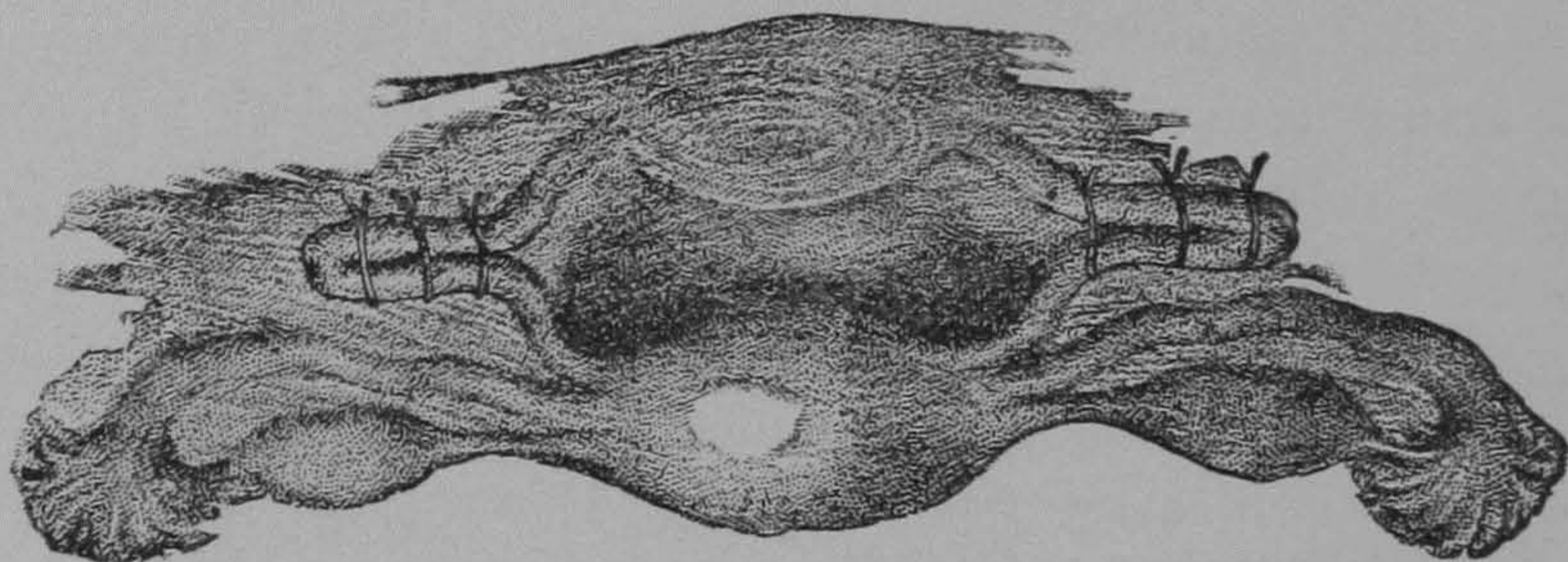


Operation proposed by Wylie and Baer for Retro-displacement of the Uterus.

*Dudley's Operation.*—The round ligaments in this case are brought in front of the uterus and attached to its surface by silk

Fig. 176.



Operation proposed by Dudley for Uterine Retro-displacement.

sutures after the approximated peritoneal surfaces have been denuded.

Alexander's operation is an exceedingly rational one, and practically accomplishes the result most effectually where the case is proper for its application. It may be properly applied in those cases of retro-displacement which are not complicated by adhesions or disease of the adnexa. This being so, the operation has but a small field of usefulness. Should adhesions exist, they would destroy the results of the operation, and by this procedure no way of breaking them up exists. Nor is there any method by which the adnexa may be examined and appropriately treated should they prove to be diseased. Diagnostic skill has as yet not reached such a point that either of these conditions can be determined with certainty in all cases without the abdomen being opened. Therefore,

cases to which Alexander's operation could properly be applied must often be submitted to an hysterorrhaphy, on account of the uncertainty of the local conditions in the pelvis.

It is an undisputable fact that the vast majority of retro-displaced uteri which give rise to annoying or serious symptoms are com-

FIG. 177.
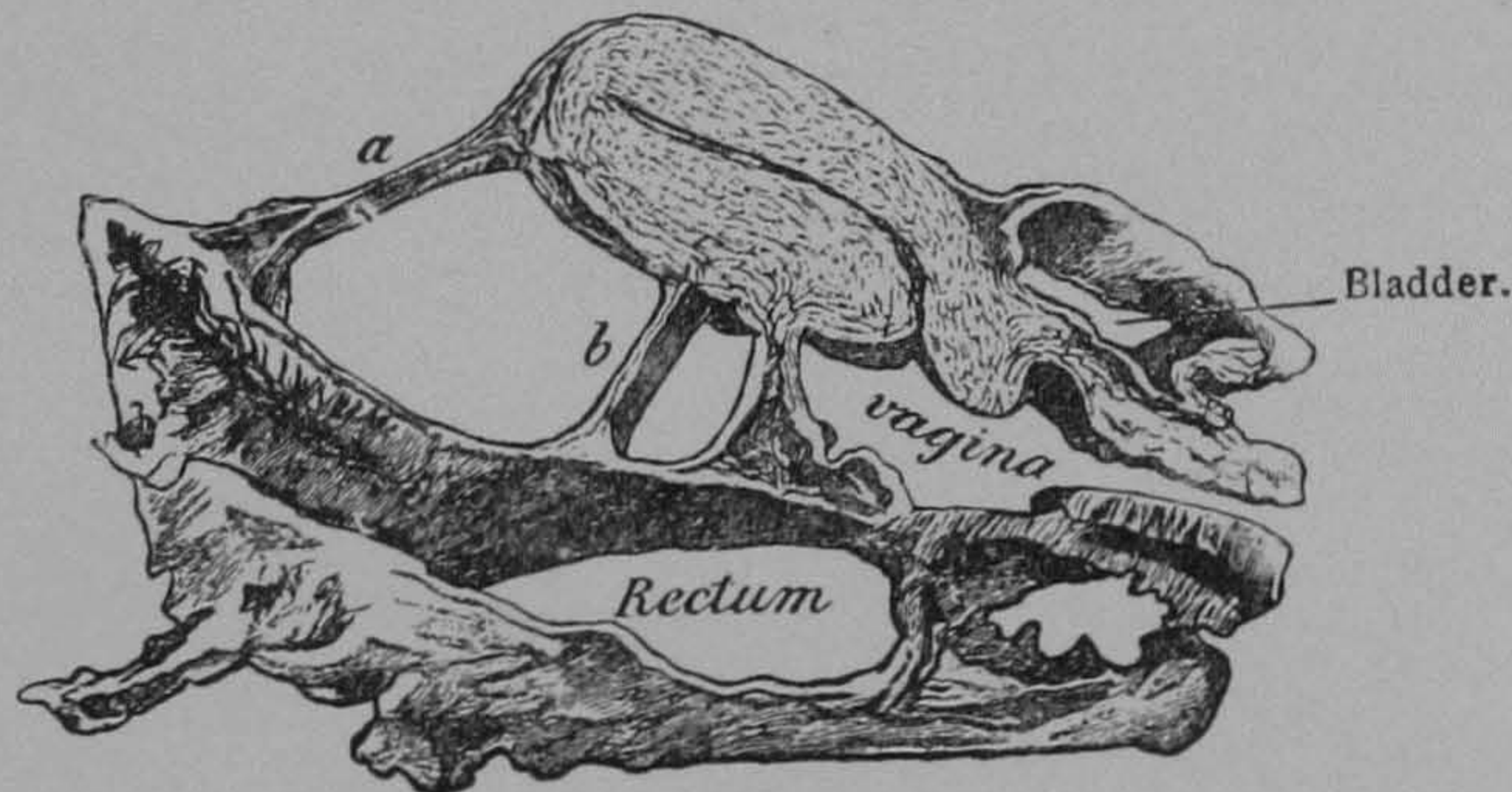


Retroversion of Slight Degree: adhesions (*a* and *b*) passing from the 'fundus and posterior wall to the rectum.

plicated by inflammatory disease of either the uterus itself or its adnexa, or the results of such inflammations, and that the symptoms arise, not from the displacement, but from the complication. Therefore most retro-displacements must be looked upon not in the light of the displacement, which in the vast majority of cases would in itself give rise to no symptoms, but in the light of the complications. We therefore treat the complications, not the displacement —otherwise we may expect little or no results. For the best accomplishment of this, as far as intrapelvic complications are concerned, hysterorrhaphy is the only operation worth considering. In this procedure the abdomen is opened, and the pelvis and all its contents carefully examined and intelligently studied. Any lesion which exists is with certainty detected and properly treated. It is often found after this that hysterorrhaphy need not be performed.

*Alexander's Operation.*—The indications for this operation— shortening the round ligaments—are limited. Granted that the perineum has been repaired and all apparent lesions of labor corrected, yet the organ persists in a retroposed state, in spite of well-directed efforts with replacement, pessaries, and tampons to keep it forward. There are no adhesions, and no tubal or ovarian disease or intrapelvic adhesions involving the uterus. In other words, all the pelvic organs seem to be in a healthy condition, but the uterus maintains a retroposition, which still gives rise to symp-

toms. These, and only these, are the cases for Alexander's operation. They must be exceedingly rare. The preparations are as for a celiotomy.

Just prior to shortening the round ligaments the uterus is always curetted. The operator then satisfies himself by *bimanual manipu-*

FIG. 178.
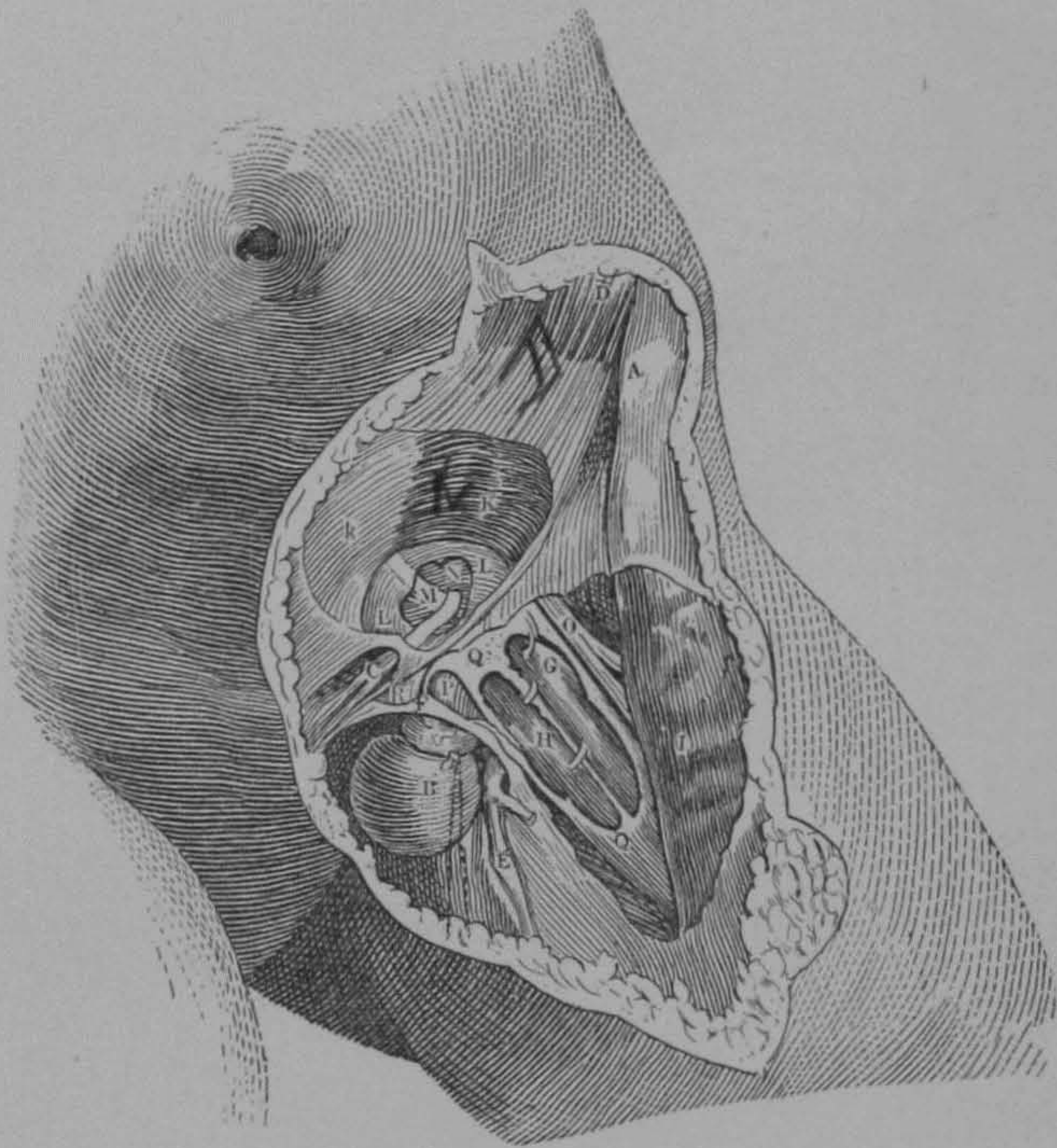


The Round Ligament and its Topographical Anatomy : A, anterior superior iliac spine; B, crural hernia; C, *round ligament of the uterus;* D, external oblique muscle; E, saphena vein; F, falciform process of the saphenous opening; G, femoral artery in its sheath; H, femoral vein in its sheath; I, sartorius muscle; K, internal oblique muscle; *k,* conjoined tendon; LL, transversalis fascia; M, epigastric artery; N, peritoneum; O, anterior crural nerve; P, hernia within the crural canal; QQ, femoral sheath : R, Gimbernat's ligament.

*lation* that the uterus can be thrown forward and the pelvis is free from disease. An incision two inches long and nearly parallel to Poupart's ligament is carried from the site of the internal inguinal ring downward and inward, terminating just within the spine of the pubis. Careful location of the pubic spine from the time of beginning the operation until the anterior wall of the inguinal canal is opened is absolutely essential to success. The subcutaneous fat is divided until the glistening aponeurosis of the external oblique muscle is exposed. The external inguinal ring is now either exposed to view or located by the touch. A grooved director is inserted through the external ring and passed along the inguinal canal, directly behind the aponeurosis of the external oblique, until its

point is over the site of the internal ring. Cutting upon the
director exactly in the direction of the fibres of the external oblique
aponeurosis, one sweep of the knife lays open the anterior wall of
the inguinal canal along its whole length. All hemorrhage is now
absolutely controlled. An assistant exposes the contents of the canal
by drawing apart the lips of the incision with the aid of tenacula.
The lower fibres of the internal oblique muscle are seen crossing
the upper half of the canal. In a fair proportion of cases the lower

FIG. 179.
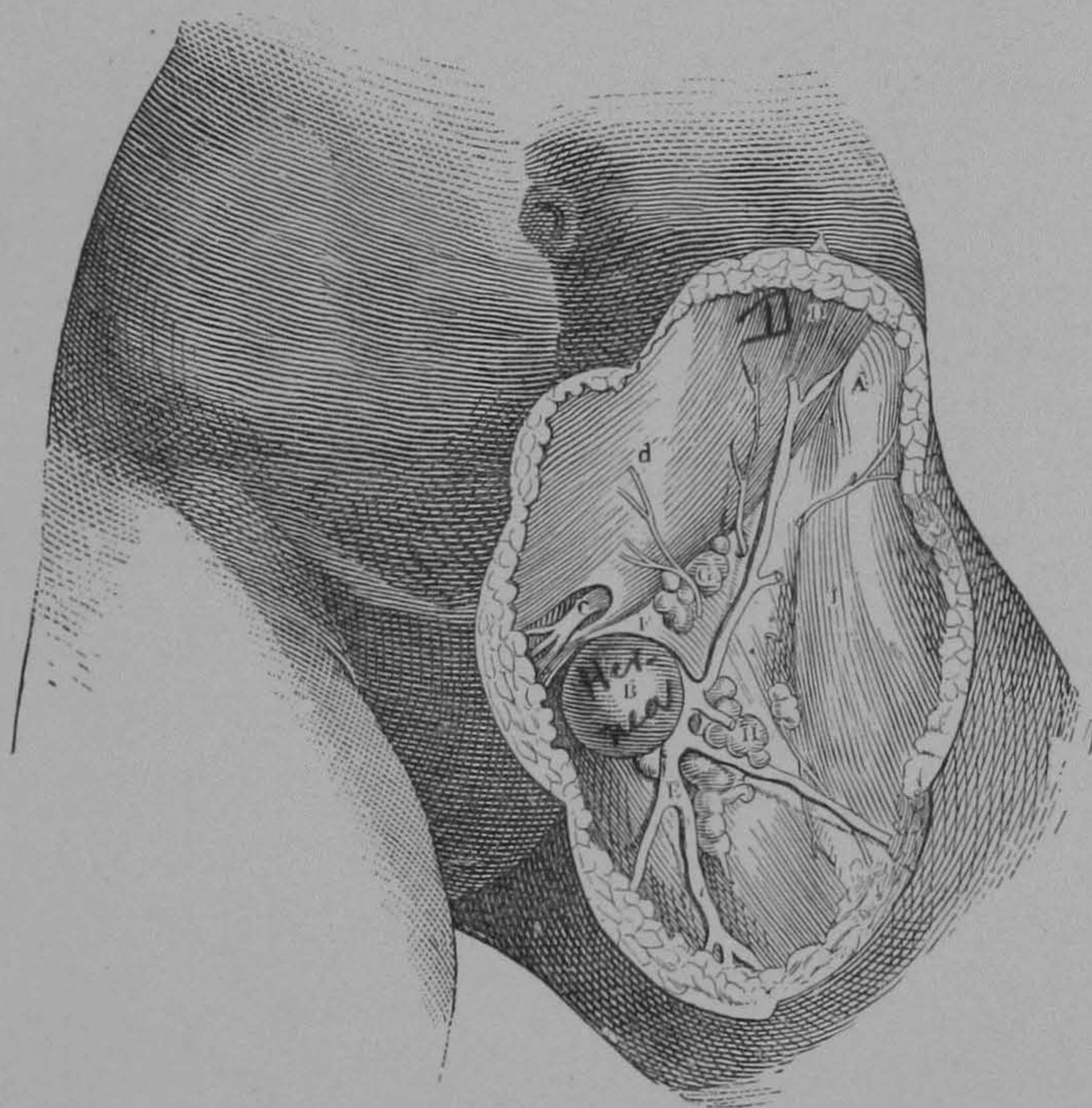


The Round Ligament and its Topographical Anatomy: G, glands in the neighborhood of Poupart's liga-
ment; H, glands in the neighborhood of the saphenous opening; I, sartorius muscle seen through its
fascia; *d*, aponeurosis of the external oblique muscle; C, *external portion of the round ligament.* The
other letters refer to the same parts as seen in the preceding figure.

end of the round ligament is at once exposed to view, emerging
from beneath the lower border of the internal oblique; more gene-
rally it is well covered and entirely hidden from view by this muscle
and an investment of fatty tissue. If the ligament is not at once
exposed to view and recognized, it is to be searched for in the follow-
ing manner: Retract the internal oblique muscle upward and inward
by a blunt hook. Take two small blunt hooks, one in either hand,
and sweep one of them, point downward and outward, along the
posterior and outer walls of the canal from the depths of the wound
skinward, hooking the entire contents of the canal. By teasing

these contents apart, more or less, by means of the two blunt hooks, the round ligament, surrounded by fat and muscular and tendinous

FIG. 180.



FIG. 181.
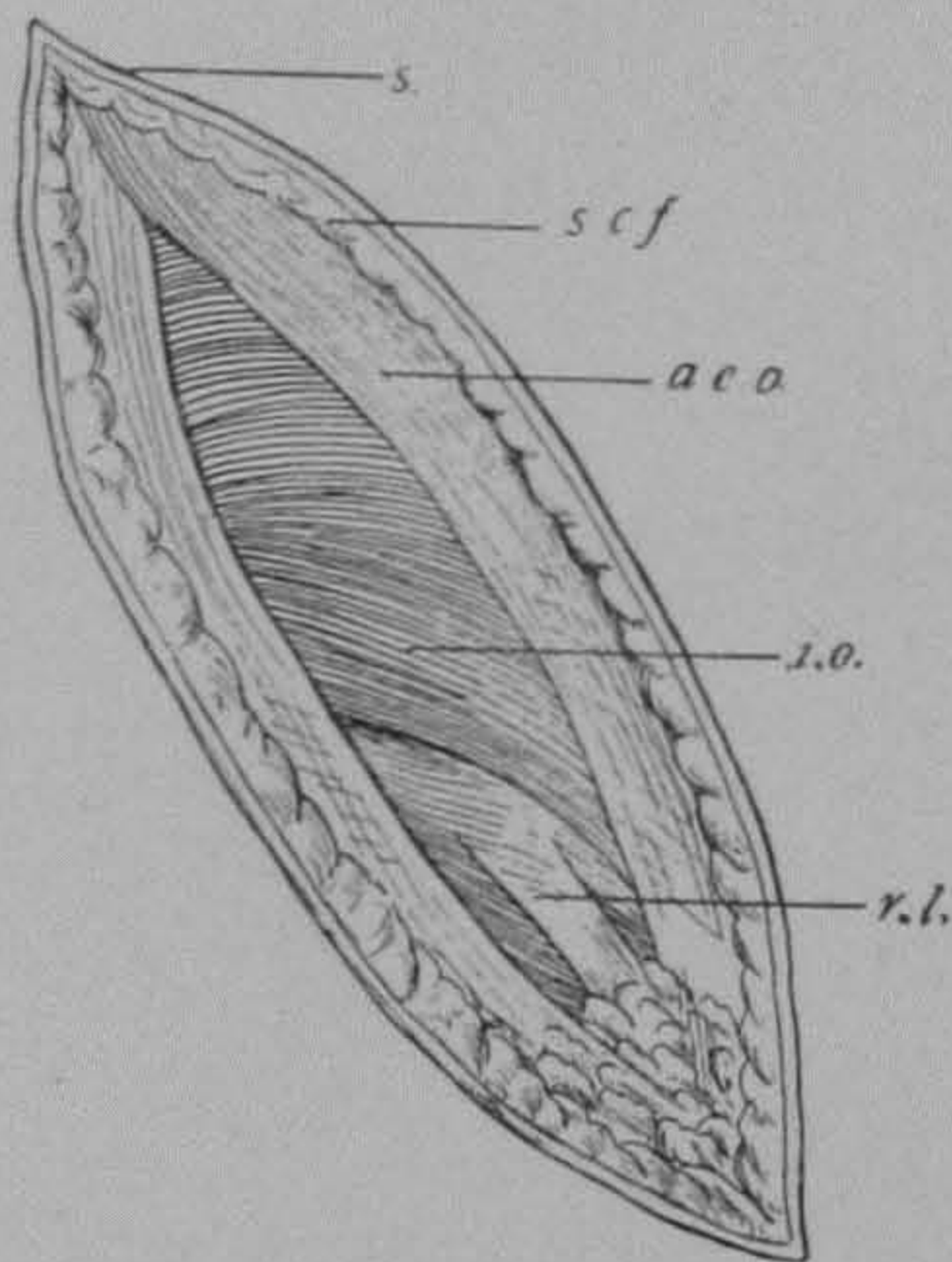


Incision, 5 ctm. long, through aponeurosis of external oblique, laying open inguinal canal from external to internal ring, and exposing internal oblique muscle and round ligament. The ligament is more or less concealed according to greater or less development of internal oblique: s., skin; s. c. f., subcutaneous fat; a. e. o., aponeurosis of external oblique; i. o., internal oblique; r. l., round ligament.
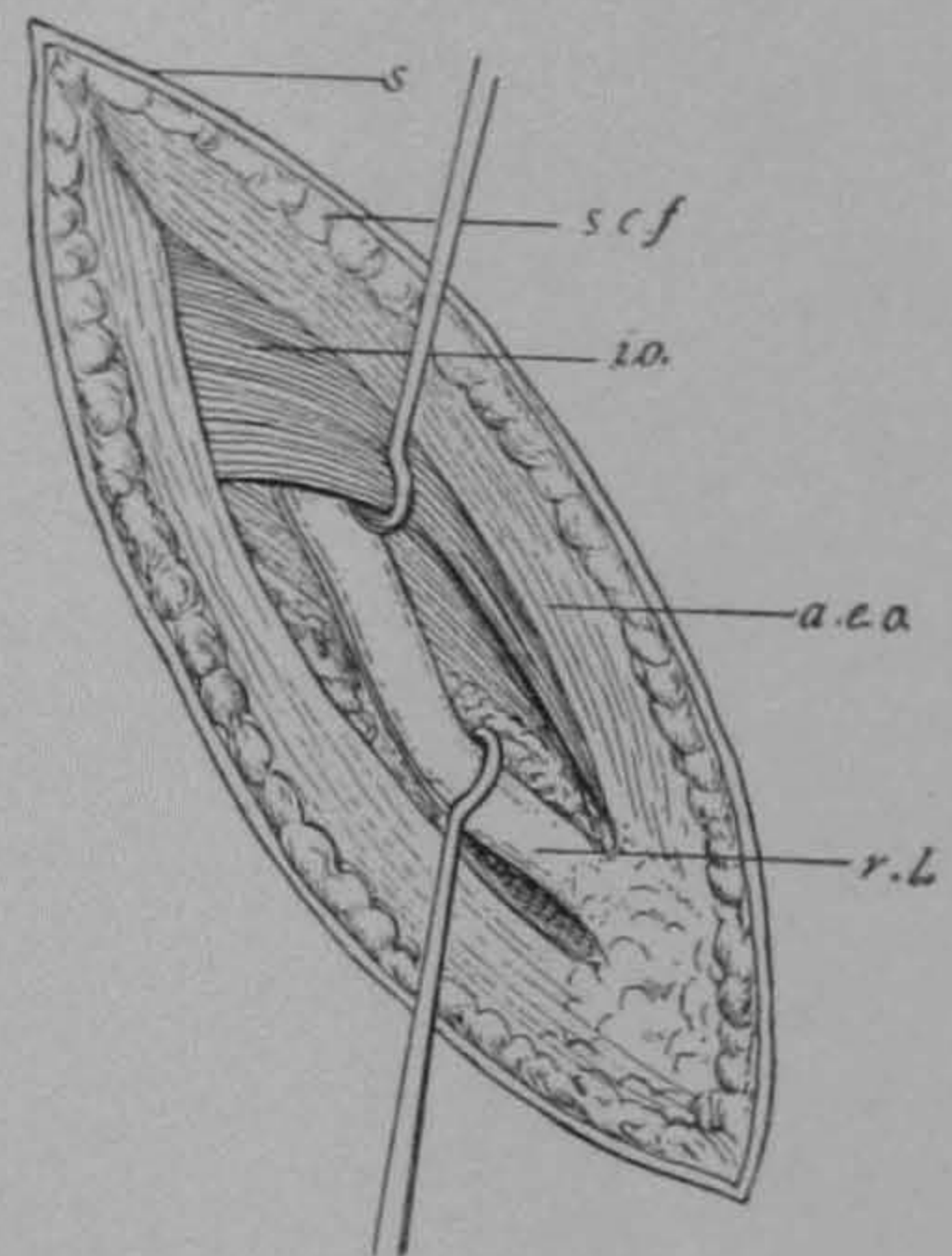
Isolating round ligament from its attachments in inguinal canal: s., skin; s. c. f., subcutaneous fat; i. o., internal oblique; a. e. o., aponeurosis of external oblique; r. l., round ligament.

fibres from the internal oblique and accompanied by the ileo-inguinal nerve, will soon be recognized, and can be followed to the internal ring. The ligament is separated from its investments in the

FIG. 182.
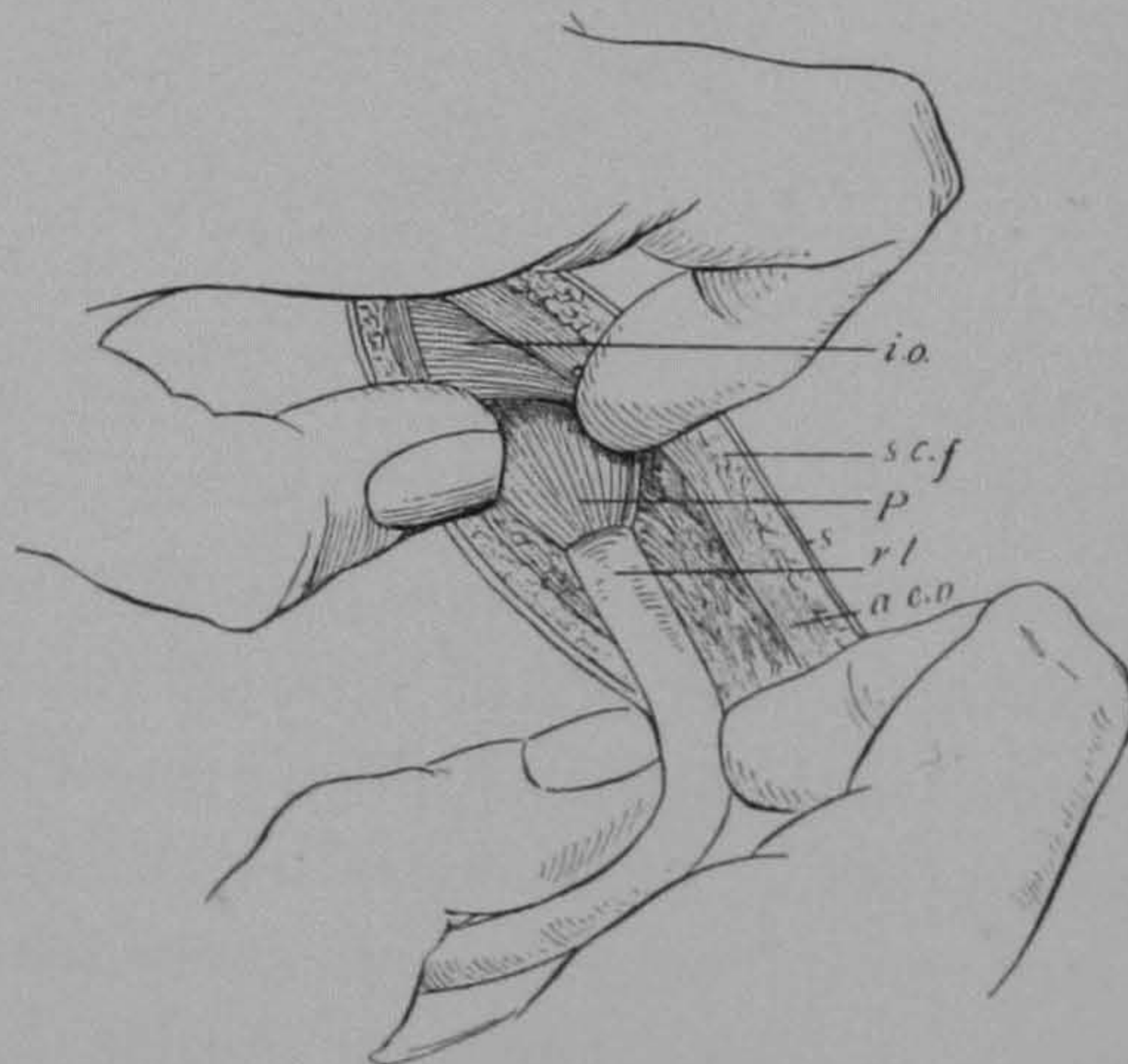


Drawing round ligament out of abdomen and stripping back, investing peritoneum of broad ligament: i. o., internal oblique; s. c. f., subcutaneous fat; P, peritoneum; r. l., round ligament; a. e. o., aponeurosis of external oblique; s, skin.

canal, care being taken not to injure the ileo-inguinal nerve. The ligament is now drawn out at the internal ring. As the ligament

gradually emerges at the internal ring the investing peritoneum comes with it. This is stripped back into the abdomen as the ligament emerges farther and farther, until finally a finger in the depths of the wound will feel the cornua of the uterus. The opposite round ligament is sought, and drawn out in the same way. After securing the desired position of the uterus by traction upon the ligaments, and adjusting the latter nicely along the bottom of the canal, the wounds are closed by sutures. The parts are brought together much after the principle of Bassini's operation for hernia.
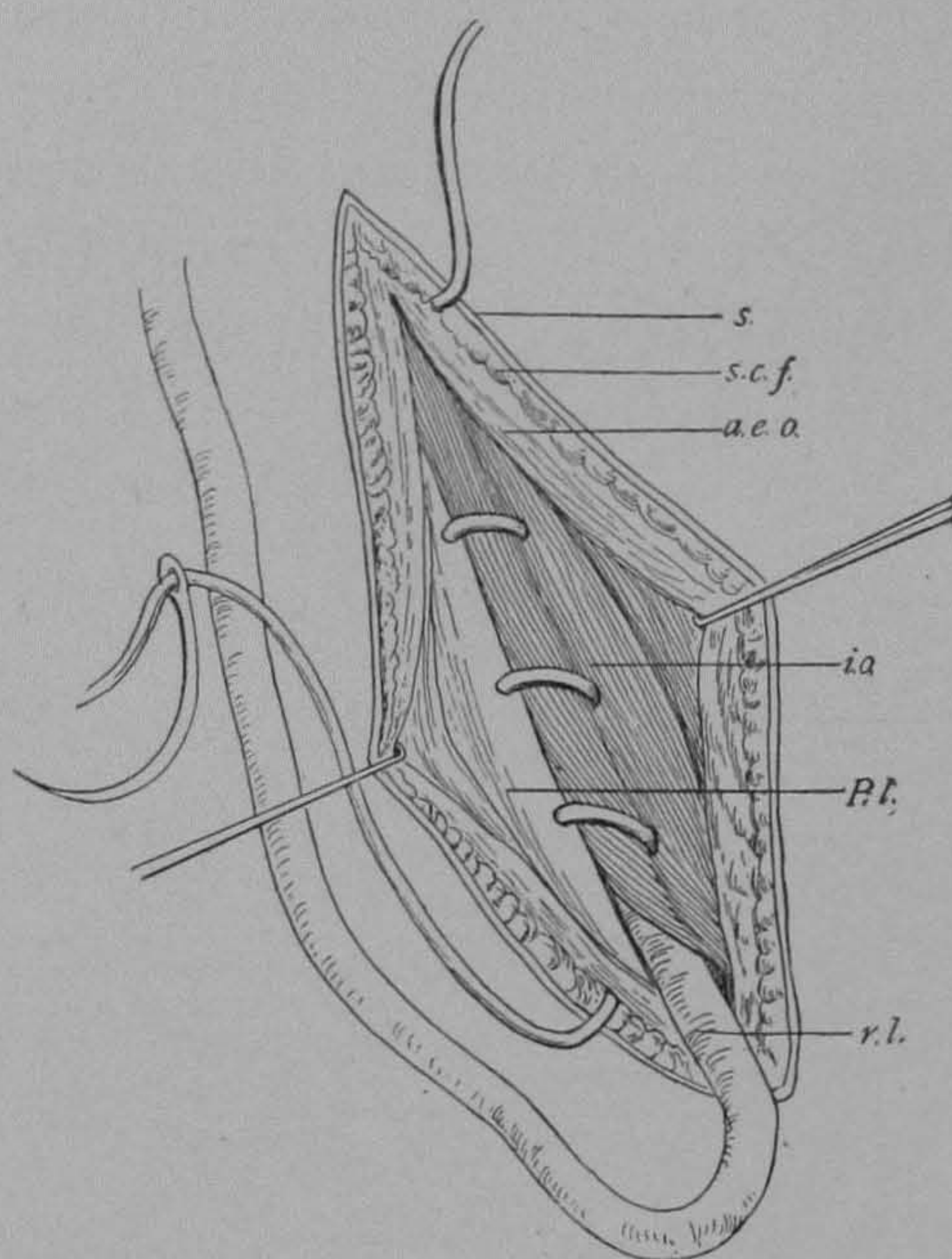
FIG. 183.
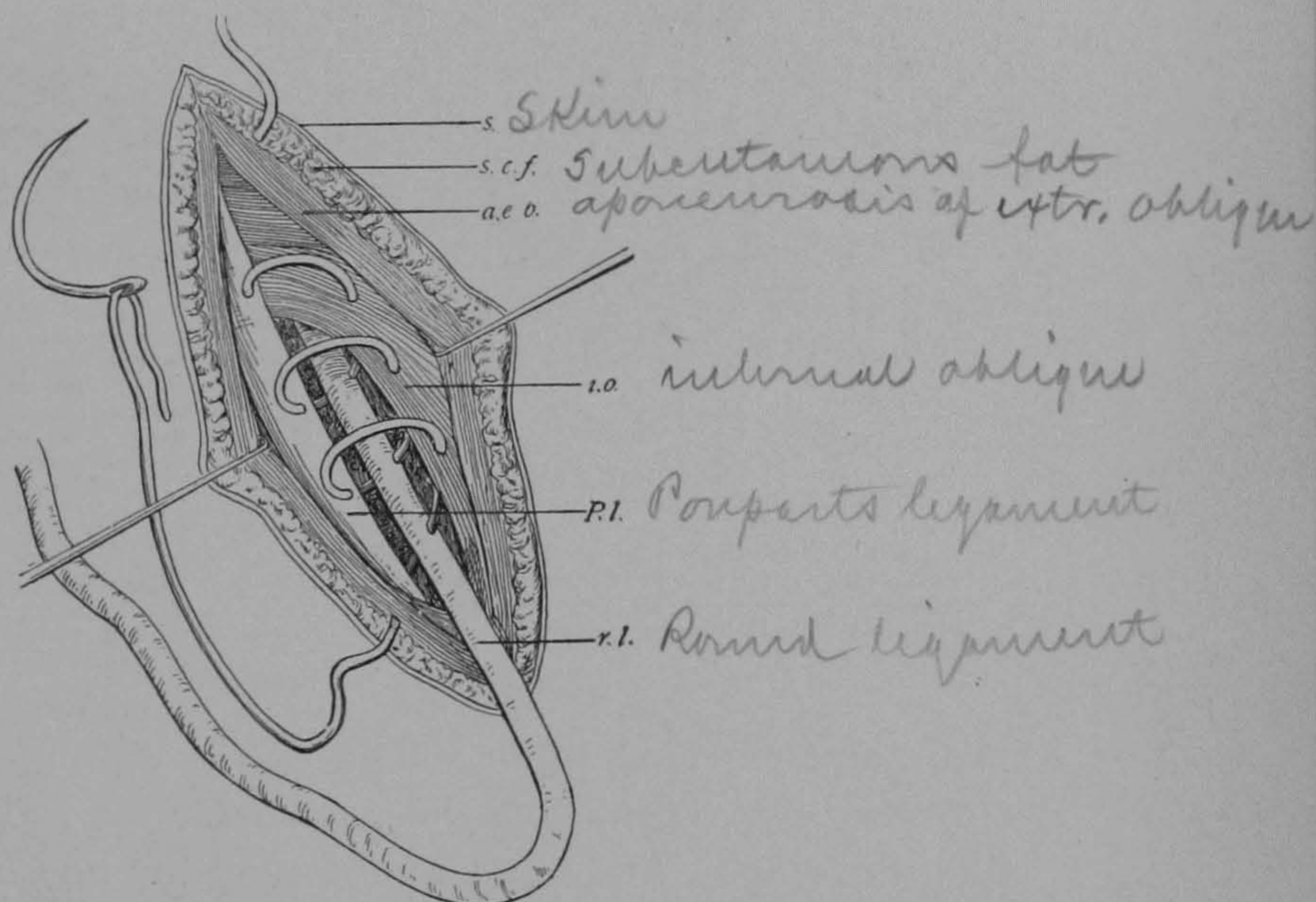


Deep tier of buried running suture of forty-day catgut, embracing internal oblique and transversalis muscles, round ligament, and Poupart's ligament. Deep part of uppermost loop of suture (not showing in cut) passes at level of and embraces margins of internal ring: *s.*, skin; *s. c.f.*, subcutaneous fat; *a.e. o.*, aponeurosis of external oblique; *r. l.*, round ligament; *P. l.*, Poupart's ligament.

Beginning at the upper angle and inner side of the right wound, the first sweep of a medium-sized curved needle armed with silk pierces the aponeurosis of the external oblique, the underlying internal oblique and transversalis muscles, the margins of the internal ring, the round ligament as it emerges between them, and the projecting shelf of Poupart's ligament. The succeeding loops of the deep tier of sutures, three or four in number, pierce the internal oblique and transversalis muscles, the round ligament, and Poupart's ligament. The last loop, in addition, penetrates the outer pillar of the external ring, and emerges upon the outer surface of the external oblique aponeurosis at the lower end and outer side of
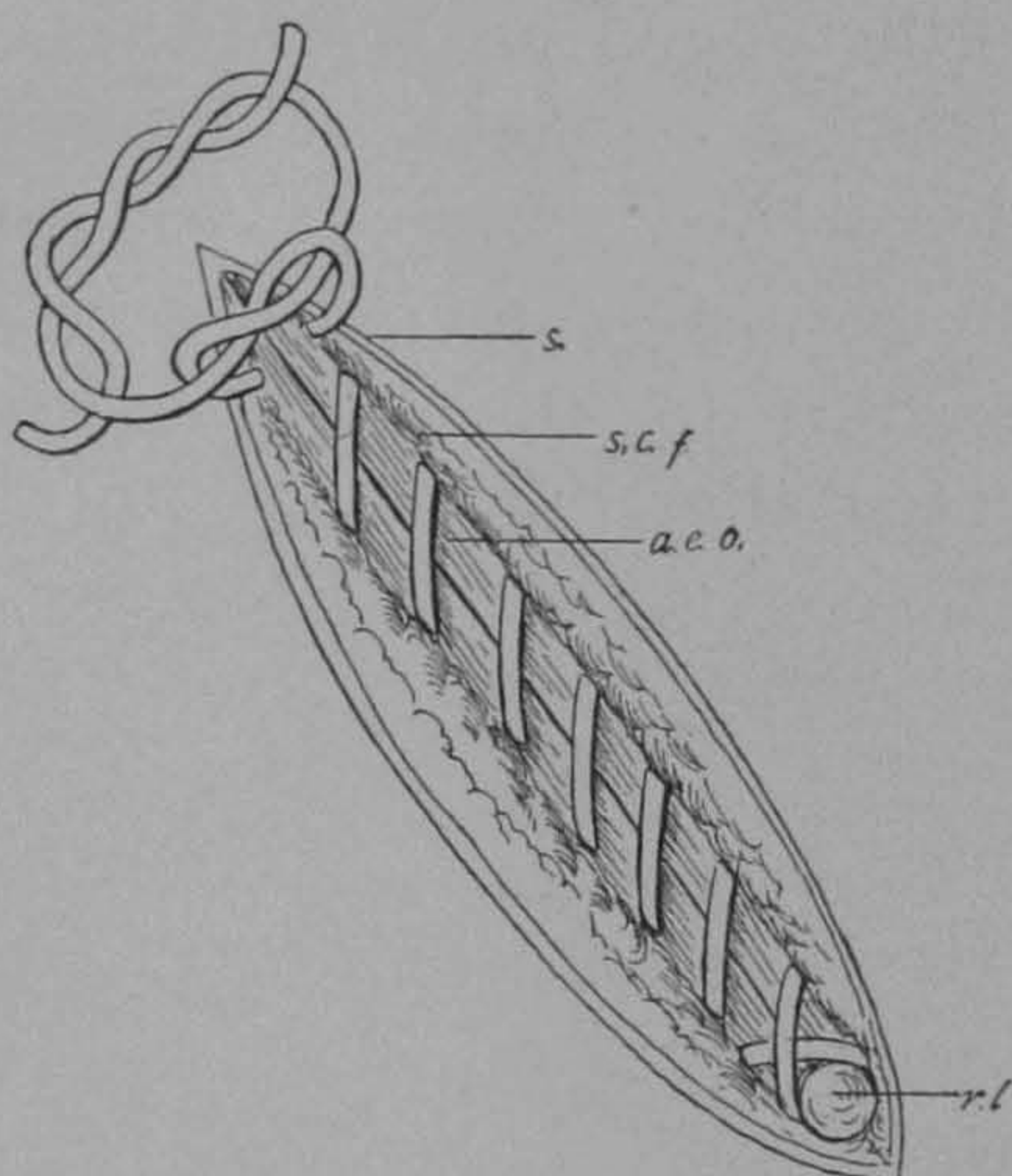
20

the fascial wound. A stitch is then taken with still the same strand of silk, piercing the internal pillar of the external ring, round liga-

FIG. 184.                                    FIG. 185.



Deep tier of suture drawn home, obliterating ingui-
nal canal :*s., skin ; s. c.f., subcutaneous fat ; a. e. o.,
aponeurosis of external oblique; i. o., internal
oblique; P. l., Poupart's ligament.

Superficial tier of buried suture of forty-day
catgut closing incision through aponeuro-
sis of external oblique, restoring anterior
wall of canal. The excess of round liga-
ment has been cut away just outside of
external ring. The part protruding through
ring, together with pillars of external ring,
pierced by lowest loop of superficial suture.
Loose knot at upper end shows proper way
of tying buried catgut knot to prevent slip-
ping. Skin and fat to be closed, all by a
subcutaneous catgut suture : s., skin ; s. c.f.,
subcutaneous fat ; a. e. o., aponeurosis of ex-
ternal oblique ; r. l., round ligament.

ment, and external pillar. The excess of round ligament is now cut away just outside of the external ring, leaving the stump to plug the ring. After thus obliterating the inguinal canal and clos- ing both internal and external rings, the same strand of silk is con- tinued upward as a running suture, uniting the lips of the incision in the external oblique aponeurosis and closing the anterior wall of the canal. The two free ends of the suture at the upper end of the wound are now tied. The skin is approximated over all by a superficial silkworm-gut or silk suture, and the wound closed with- out drainage. The ordinary dry sterile dressing used for all abdom- inal wounds is applied (see Technique). No pessary is at any time needed after the operation.

The difficulties of the operation lie principally in the technique, and can all be overcome by practice : this is particularly so in the case of not being able to find the round ligament. Should the liga- ment break while drawing it out, it should be picked up at its ute- rine end and the operation proceeded with ; in case the end cannot

be readily found, the wounds are best closed and hysterorrhaphy per-
formed. Subsequent hernia is practically the only after-result to
be feared.

*Hysterrorhaphy or Ventro-suspension.*—The procedure is essen-
tially a suspension of the uterus from the abdominal wall. Silk-
worm-gut is the preferable suture material, combining the advantages
of silk and silver wire, while free from their drawbacks. The
abdomen is opened as low down as possible, the incision being small.
Trendelenberg's posture is of the greatest help, because the moment
the abdomen is opened the pelvis can be emptied of bowels, thus
eliminating the danger of injury to the intestines. When the
abdomen is opened a careful inspection is made of the uterus and
adnexa and the exact condition of the pelvic contents determined.
Under the combined guidance of eye and touch existing adhesions
are severed. In the majority of cases manipulation with two fingers
will suffice to break up the adhesions. Old and very firm adhesions
may require the assistance of the scissors or scalpel, care being taken
that the rectum be not wounded. It is in just these cases, the diffi-

FIG. 186.
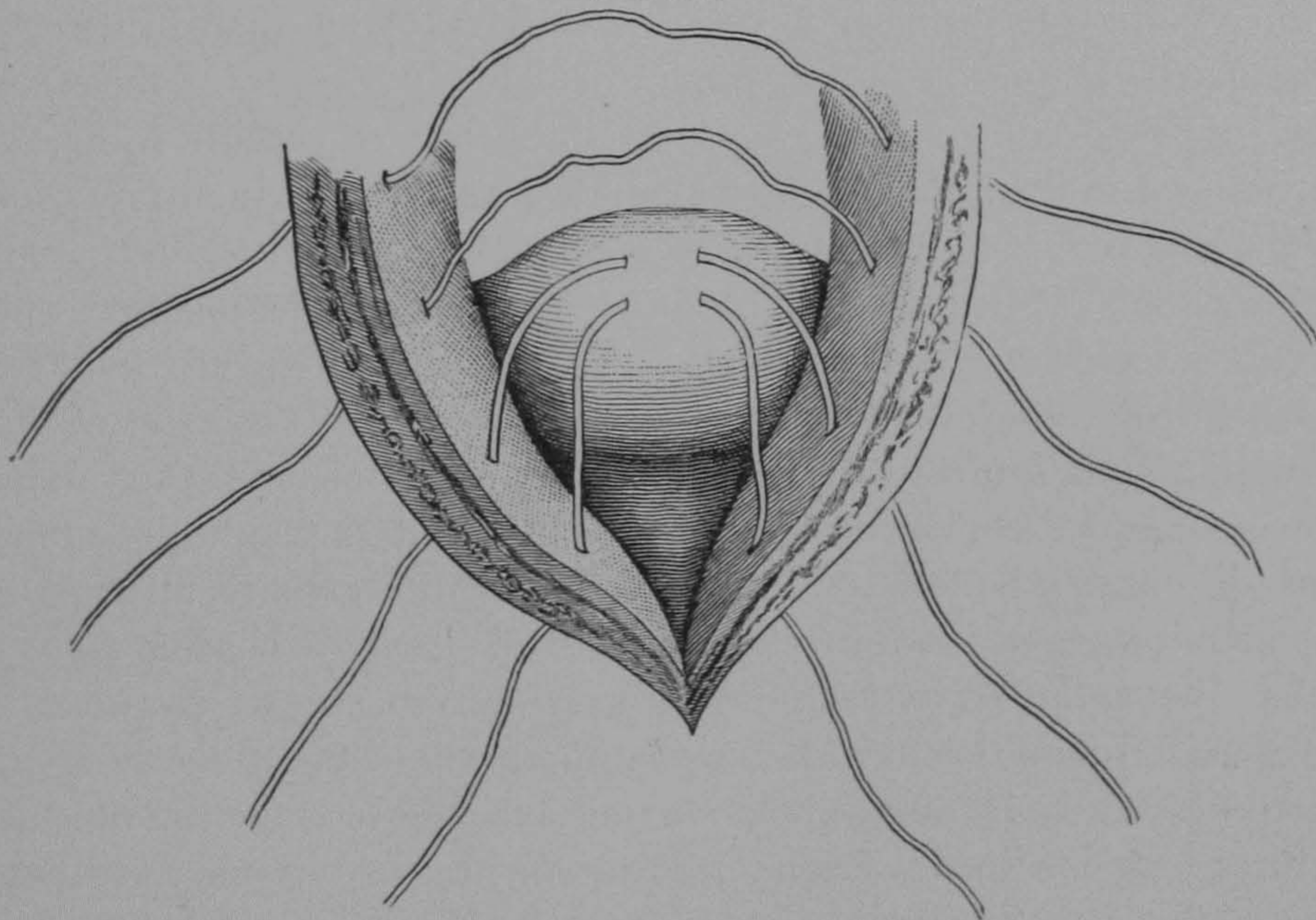


Sutures in Position in Hysterorrhaphy.

culties of which may not be foretold, that Trendelenberg's posture
is of especial benefit; the incision need not be longer than is re-
quired in the horizontal posture. If the operation be attempted in

the latter posture, the greatest annoyance is felt from the intestines slipping in between the fingers: intestines are thereby subjected to unnecessary and at times dangerous handling. Hemorrhage due to severing the adhesions is slight, as a rule. Should the capillary oozing be at all disagreeable and collect in a pool in the cul-de-sac, a wad of antiseptic gauze may be introduced to exercise pressure and catch the blood. This is to be removed just before the sutures are tied. Very seldom will a ligature or stitch be necessary to control the trifling bleeding. Should such be required, it may preferably be of catgut.

The uterus being freed and elevated, the adnexa are carefully inspected, if their exact condition has not already become apparent while releasing the uterus. Should they be the seat of disease, whatever method of treating them is indicated is carried out. The uterus is lifted up into the wound and the exact site for the fixation of the womb is determined. A suture is passed through the entire abdominal wall of one side. The needle is again grasped in the needle-holder and passed superficially beneath the uterine serosa at a point a third of an inch posterior to the apex of the fundus uteri from side to side through a space a quarter of an inch in length. The needle is then passed through the abdominal layers of the other side, opposite the point of first introduction. A second suture is introduced in a similar manner about a quarter of an inch posterior to the first one. A full-curved bayonet-pointed needle is best used, one without a cutting edge. Unless a sharp needle be used the needle-punctures bleed but little. These two sutures are held by catch-forceps, and others introduced as usual to close the rest of the wound. Two sutures only pass through the uterine tissue. The uterine sutures are tied first, after which, if it be thought desirable, the patient may be lowered from Trendelenberg's posture, all danger of including gut between the uterus and parietes having passed when the sutures are tied. While tying the sutures, especially those which pass through the uterus, the peritoneum of the incision should carefully be approximated: and it is wise to leave the uterine sutures long for purposes of identification. It is advisable to scarify gently that part of the uterine surface which is to come next to the parietal peritoneum, in order to ensure sufficient plastic union between the opposed surfaces. Dressings are applied in the usual manner. The sutures should be removed about the eighth day, but those through the uterus may remain three weeks or longer. Just

before the removal of these latter the uterus should be held up by a
vaginal tampon, which should be employed for several weeks longer.
The objections made to the operation are—its possible rate of mor-

Fig. 187.
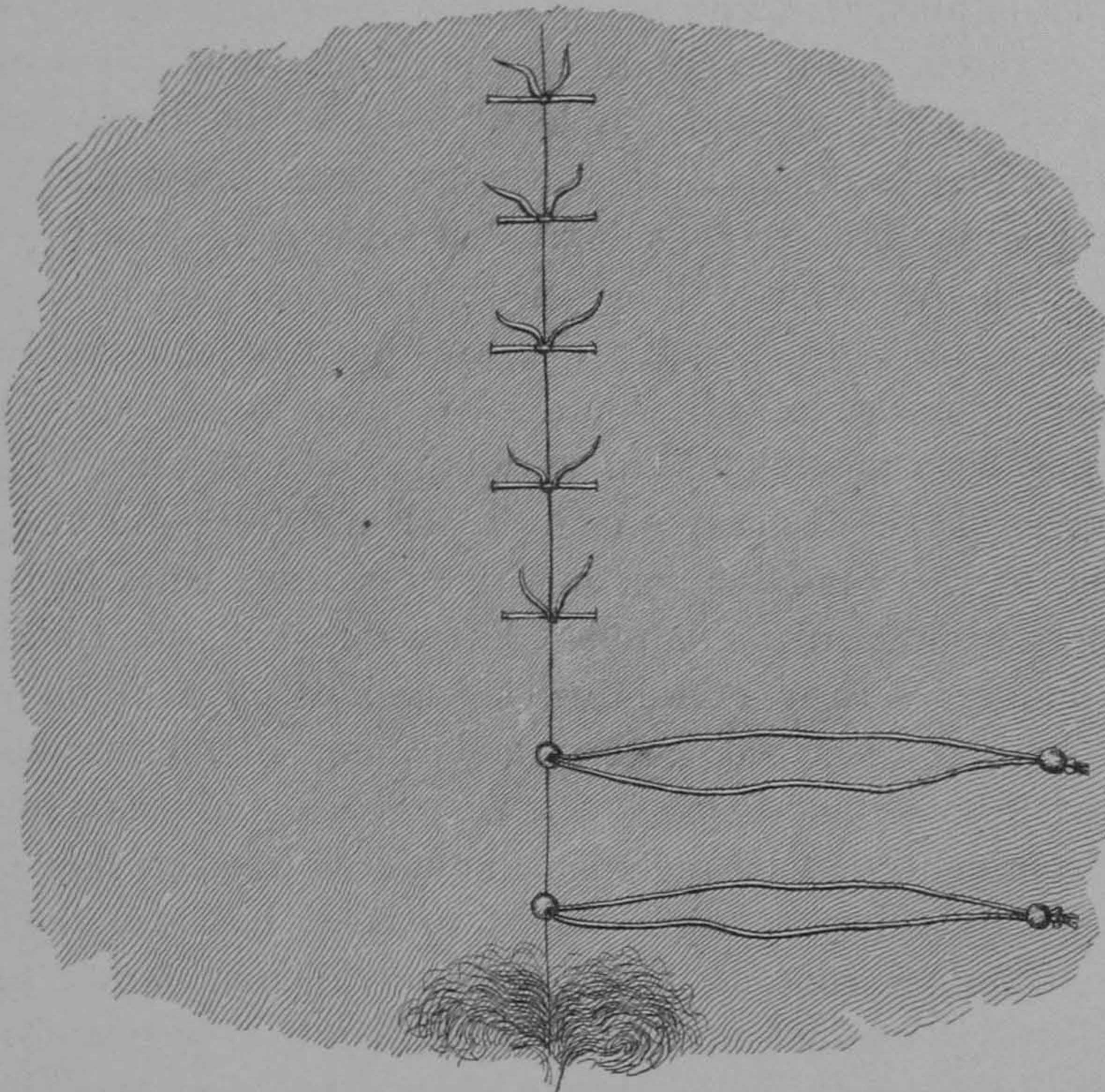


Stitches in situ in the Abdominal Wall after Hysterorrhaphy. Two lower sutures—the ones which pass
into uterine tissue—are shotted.

tality; the production of a break in the ventral wall, with the pos-
sibility of hernia; the formation of a false band around which
intestines may become caught; the induced immobility of the organ
and its effect upon a future pregnancy. None of these objections
are pertinent when the hysterorrhaphy is done in a proper manner,
but they become forcible when it is improperly performed. They
may be considered separately. There is no rate of mortality inhe-
rent in the operation, and it does not complicate other operative pro-
cedures performed at the same time. The mortality attending it is
that only of "accident," which is inherent in every operation which
opens the abdominal cavity. The possibility of ventral hernia is
undoubtedly attendant upon every operation in which the peritoneal
cavity is opened by incision through the abdomen. This complica-
tion occurs in inverse ratio to the care in the technique. The per-

centage is exceedingly small. No case, so far as we know, has been reported where intestinal obstruction has been due to the adhesion between the uterus and ventral wall.

It is essential to the future of the patient that a too firm fixation be not accomplished. The object aimed at should be to throw the fundus of the uterus into an anterior position. A slight suspending cord is all that is necessary to keep it there, the intra-abdominal pressure aiding in this. If the adhesion be a broad and firm one and pregnancy follows, considerable trouble may result. During gestation the posterior wall of the uterus develops alone, to the exclusion of the anterior wall, which remains fixed and undeveloped. At labor dystocias of all kinds have been noted, and Cesarean section has been necessitated in a number of instances, with not a few deaths. If the technique be a proper one, the point of adhesion posterior to the fundal apex, and the resulting band be long and thin, merely sufficient for support, but not for fixation, most if not all the dangers of the operation will be avoided. The union obtained by the method described is very tender, and, like other adhesions produced from serous surfaces, it is very elastic and prone to stretch. This is eminently so in regard to the uterus fixed in this position, for it not only has its own weight to bear, but also that of the entire abdominal contents when the pelvic floor tends to bulge under intra-abdominal pressure. Abortion has occurred in uteri so fixed. Pregnancy which has progressed to full term has been frequently reported.

## PROLAPSUS.

Descent or prolapse of the uterus may be of any degree, from that of slight displacement, which accompanies a retroversion, to the complete, where the whole organ is below the pelvic outlet. Therefore any explanation of the amount of descent must be descriptive, and the condition cannot be divided into first, second and third degrees.

As a very general rule, the condition occurs in women who have borne children, but it also occurs in nulliparæ. In the two classes the affection is essentially different in etiology, pathology, and treatment.

Complete and partial prolapse comes on gradually in most cases, but sudden efforts or effects, as lifting, being crushed, or falling from

a height, may bring it on acutely by rupturing the round, utero-sacral, and broad ligaments.

PATHOLOGY OF COMPLETE PROLAPSE.—The vagina is inverted. Its posterior wall is prevented from further descent by the sphincter ani. The anterior wall is checked in further descent by its attachment to the bladder, the latter doing this through its insertion at the symphysis. The epithelium of the vagina becomes thick-

FIG. 188.
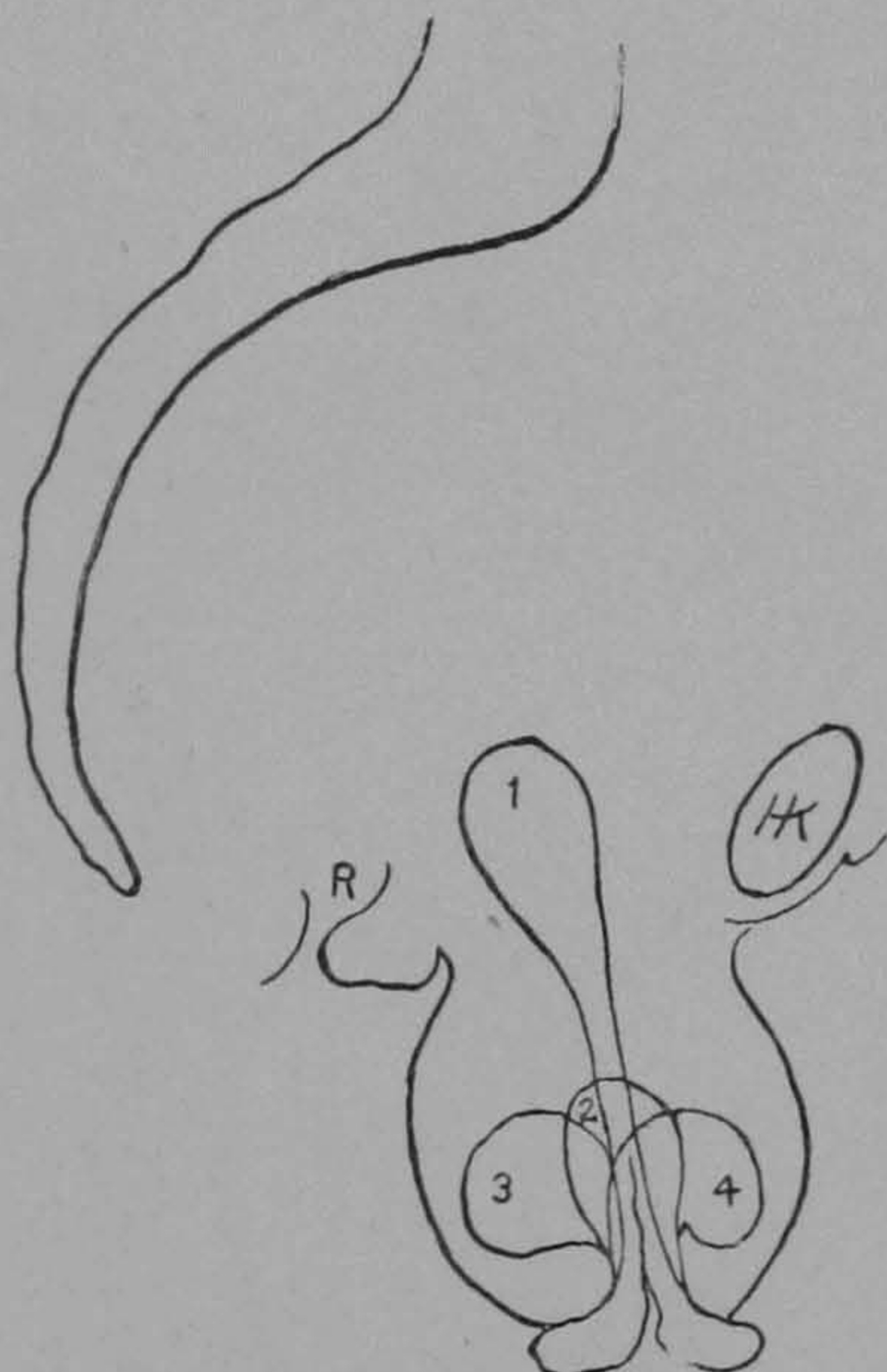


Varieties of Prolapsus.

ened and like cuticle. Continuous irritation against the thighs and clothing may produce local losses of tissue in the shape of irregular ulcers. The urethra is also drawn down and its canal is U-shaped. The uterus occupies the pouch of the inverted vagina, and both before and behind are culs-de-sac lined with peritoneum. Both are below the outlet of the pelvis. Further descent of the uterus is prevented by the anterior and posterior vaginal walls, by the utero-sacral ligaments, but still more by the broad ligaments. The round ligaments play but a small part in supporting the organ.

The cervix is engorged from stasis, and its vaginal portion, being the lowest point of the tumor, may be ulcerated. According to the integrity of the external os, there may or may not be ectropion of *Eversion* the cervical mucous membrane. The uterine wall and mucosa are in the condition of chronic hypertrophic metritis and endometritis,

*Ectropion = eversion of the Endometrium.*

both being thickened with the production of new connective-tissue elements. There is usually chronic urethritis from retention of the urine in the dilated and prolapsed urethra, and there may be chronic cystitis. The cul-de-sac between uterus and bladder and the utero-

FIG. 189.
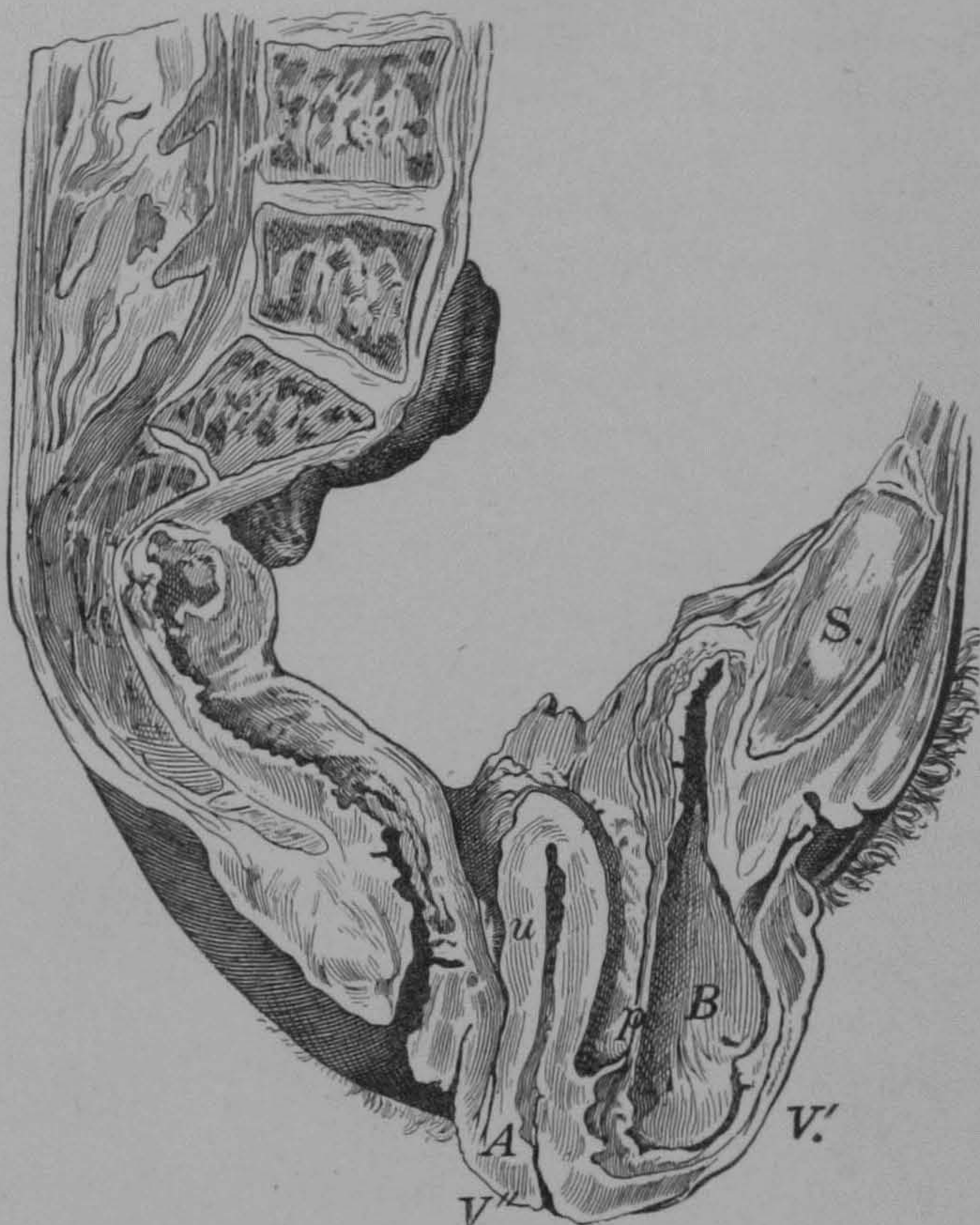


Vertical Mesial Section of Prolapsus Uteri : *u*, uterus; *B*, bladder; *V'*, anterior vaginal wall; *V''*, posterior vaginal wall; *S*, pubic bone; *A*, posterior peritoneal pouch; *p*, anterior peritoneal pouch.

rectal pouch may be occupied by intestines; and the ovaries and tubes lie on top of the fundus. Tension on the broad ligaments produces obstruction in the ureters, and inflammatory conditions, even hydronephrosis, may result. In very old cases marked atrophy of the uterus may ensue.

The condition is essentially that of hernia through the pelvic floor. Continuous irritation of the cervix of the prolapsed uterus existing for years may even produce epithelioma. Torsion of the broad ligaments produces varicocele in the pampiniform plexus. Irritation of the protruding mass has caused acute swelling, with rapid spread of the ulcerations and all the symptoms of strangulation with attendant difficulty of replacement. Anesthesia is then

advisable for reduction, and possibly abdominal section may become necessary. If failure at reduction results, vaginal hysterectomy may be demanded.

Causes.—The starting-point of all cases of prolapse is a break in the pelvic floor, or relaxation of the uterine ligaments, or increased weight of the uterus, or all combined. With any one of these factors present an increase in intra-abdominal pressure

Fig. 190.
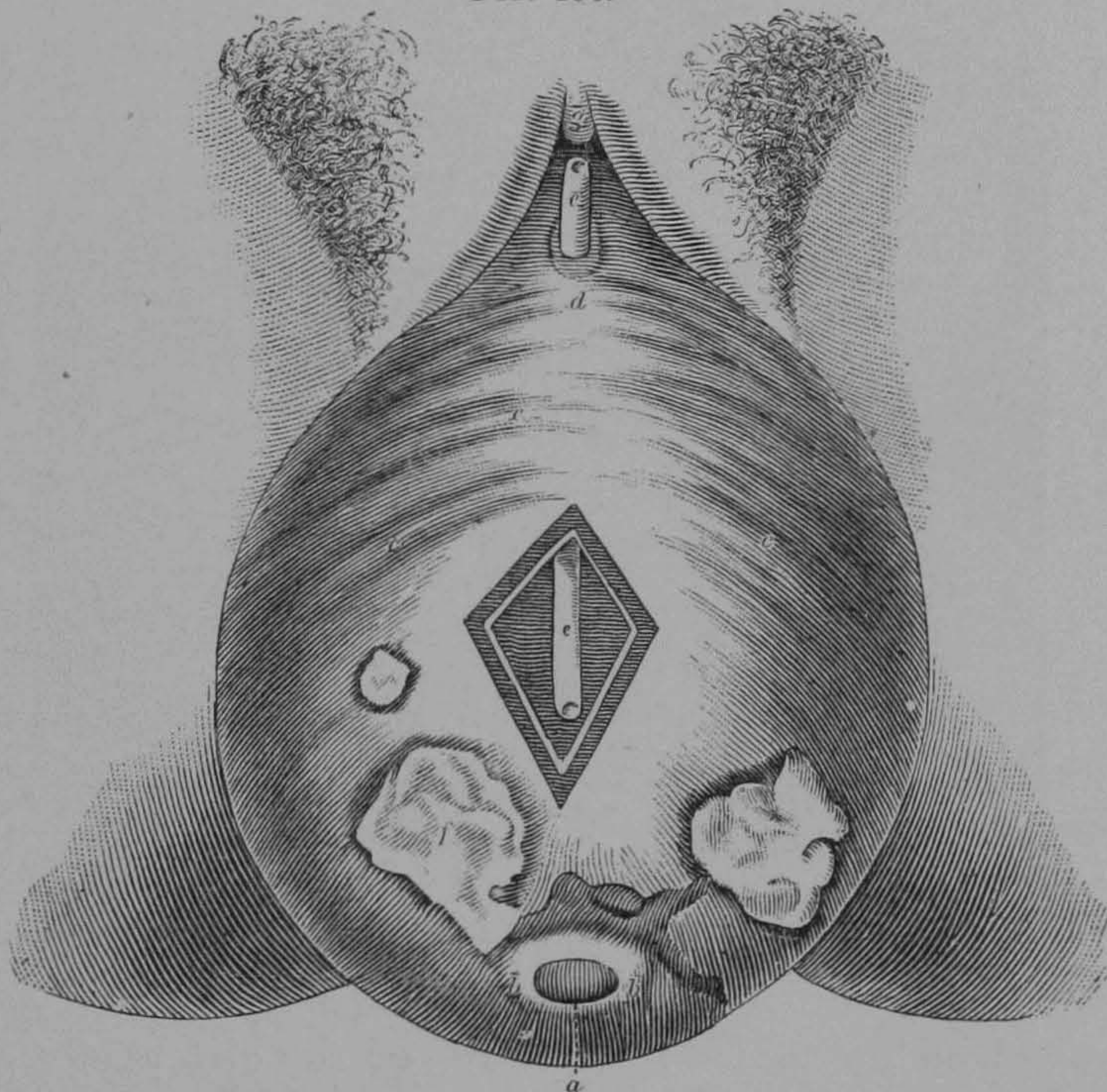


Complete Prolapse of the Uterus : *a,* cervical canal; *b,b,* superior portion of the vagina, which is now the inferior; *c,c,c,* mucous surface of anterior wall of the vagina; *d,* urinary meatus; *e,e,* probe passed vertically into the former neck of the bladder, to show the total turning inside out of that organ; *f,* ulceration of the vaginal mucous membrane.

will produce descent of the uterus. Although the ligaments may for a time return the organ to its normal position after such effort, yet the continuous strain will in time produce the permanent lesion.

Thus it is that we find the condition following labor, or resulting from a neoplasm, or associated with subinvolution and supravaginal hypertrophy of the cervix.

Tears in the pelvic floor should warn us against too early resumption of duty after labor. For involution of the uterus alone is not all that is necessary, but the elongated ligaments and generally enlarged parturient canal must also shrink, that the organ may have proper support.

Rupture of the perineum more than any one other lesion con-
duces to prolapse, and in the following way : The parturient woman
is naturally inclined to constipation from the very nature of her
weakened condition.  In attempting to force out the stool by strain-

Fig. 191.
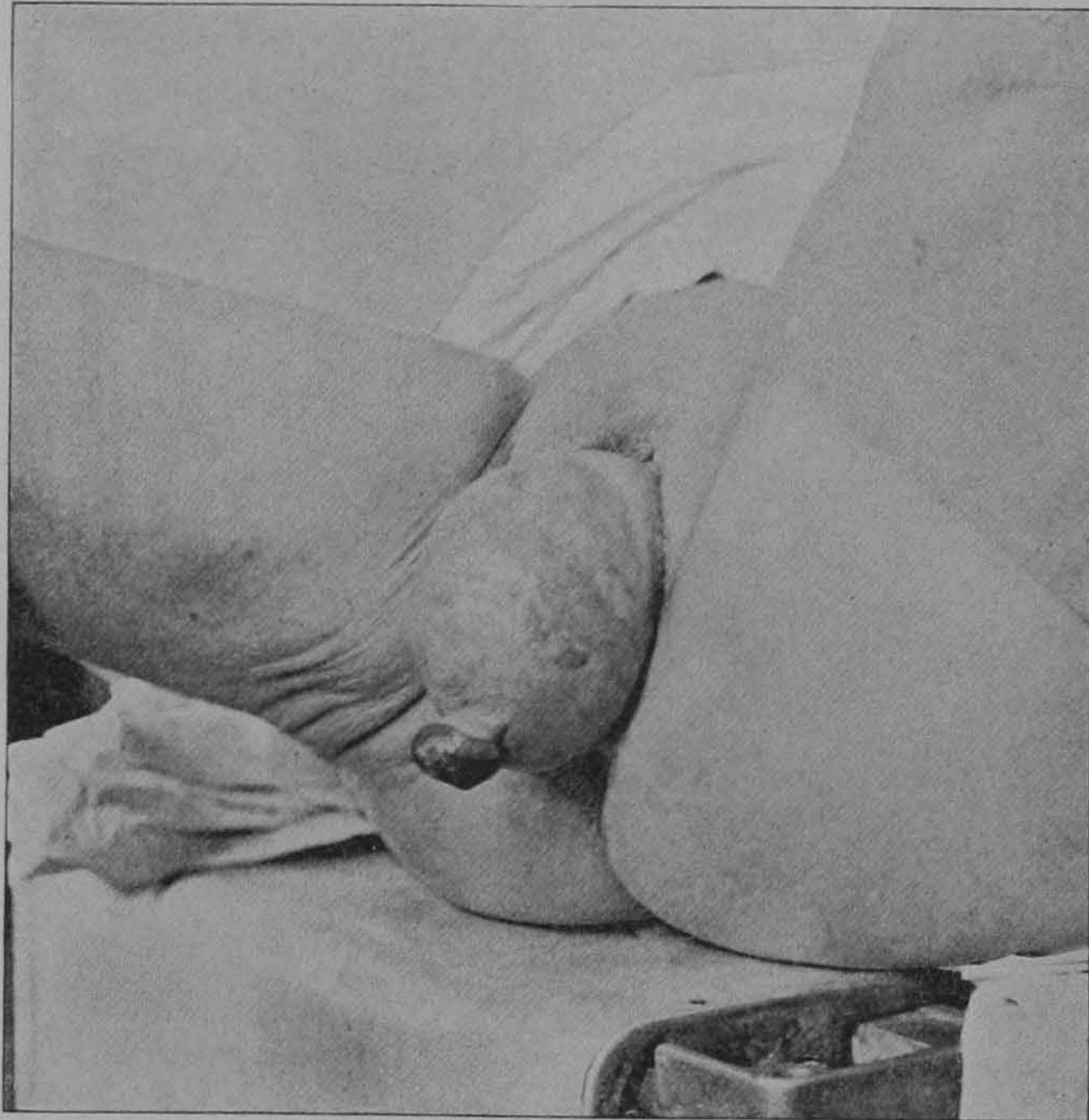


Complete Prolapsus Uteri, showing ulcer; also hypertrophy of the mucous membrane; the cervix or
os not seen.

ing the break in the pelvic floor allows of the escape of a good deal
of force, and she has to bear down very hard.  As she forces the
stool down, it does not have the resistance of the perineum, which
would naturally direct it backward through the sphincter.  The
levator ani, which is the muscle opposed in its action to the sphinc-
ter ani, and which dilates the latter, being torn, the sphincter cannot
dilate normally, but rather closes more tightly.  The stool there-
fore meets this muscle contracted, and, the pressure still continuing,
the contents of the bowel bulge out the rectum into the lumen of
the vagina, thereby producing a rectocele.  In doing this the poste-
rior vaginal wall is drawn down, and it, in turn, pulls on the cervix.
In front of the uterus is the thick-walled bladder, preventing its
forward movement: therefore it is pulled backward.  This traction,
together with the steadily-increasing intra-abdominal pressure which
the woman keeps up to force out the feces, produces both retrover-

sion and descent. The bowel being emptied, the pressure subsides, and the elasticity of the tissues draws up the displaced organs.

FIG. 192.
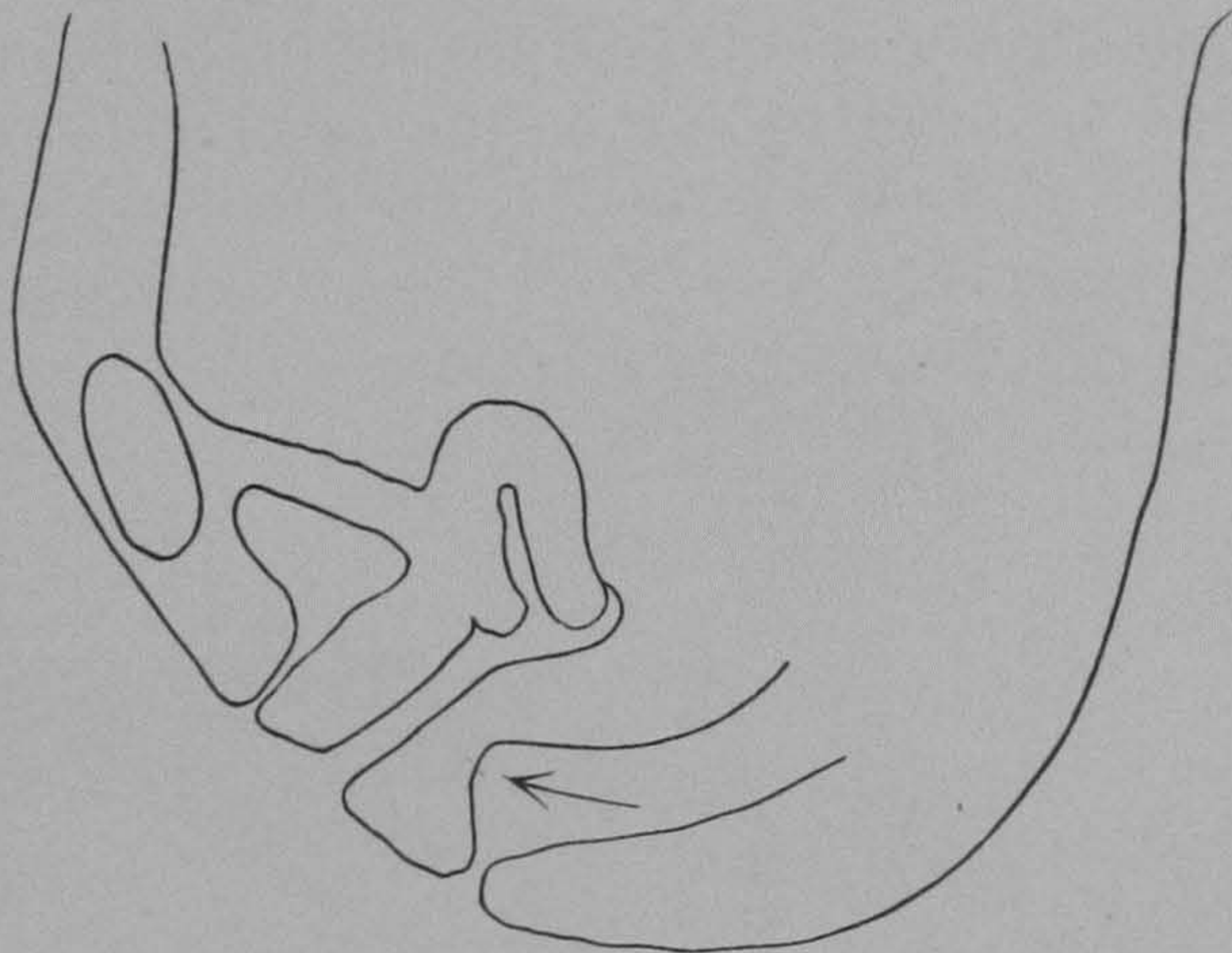


The arrow shows the direction of force in the case of a normal perineum when straining at stool. The thick perineum resists, and the fecal matter is consequently forced in the line of the anus and a normal passage secured.

Frequent repetitions of this, together with other acts which increase this intra-abdominal pressure, gradually bring about the condition described as prolapse. The rectocele is the first pouch of tissue to appear, as a rule. Following upon this rectocele, the

FIG. 193.



The perineum being ruptured no longer resists the force of straining at stool, but is pushed by the advancing fecal matter until it begins to protrude from the vulval orifice. The result is constipation and progressive formation of a rectocele.

uterus having descended somewhat, comes the anterior vaginal wall, producing a cystocele. In this anterior pouch is contained more or

less of the bladder. Cystocele occasionally occurs before the recto-
cele, but when it does so it is the result of tears of the anterior wall
during delivery. So great has become the desire in forceps and
other difficult deliveries to avoid wounding the perineum that the
tissues just beneath the symphysis are subjected to much dragging
force, resulting in tears to one or the other side of the urethra.

FIG. 194.
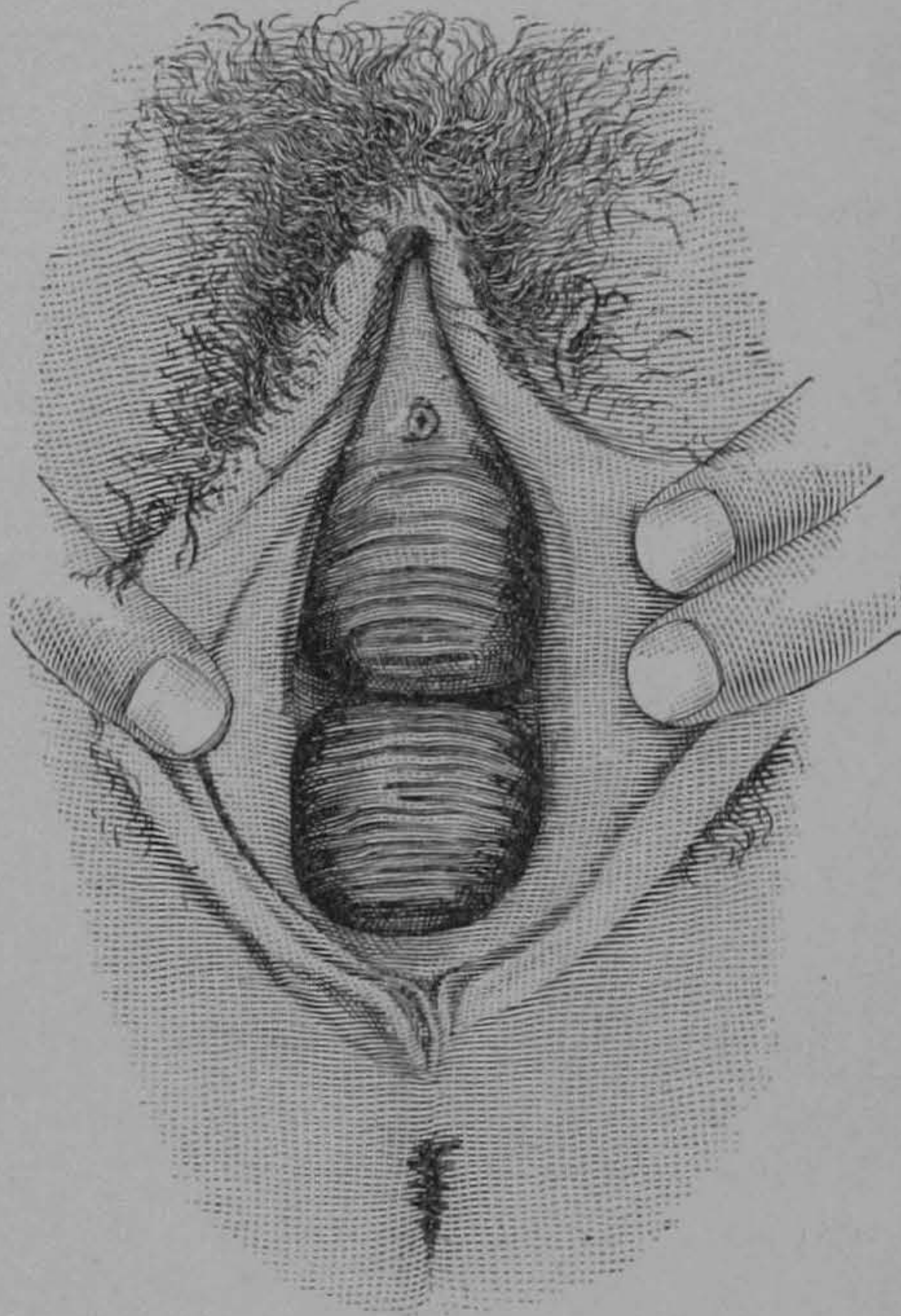


Cystocele and Rectocele.

The urethra may even be loosened from its attachments to the sym-
physis. It is in this way that so great a laxity of attachment of
the anterior vaginal wall to the bladder and symphysis is produced
as to cause the appearance of cystocele before rectocele ensues. From
what has been said the importance of easy evacuation of the bowels
by enemata without straining, whenever the perineum is torn,
must be apparent. When the axis of the uterus has become coin-
cident with that of the vagina the intra-abdominal pressure bears
directly upon the uterus continuously, in a direction which tends
to force it out. It must not be forgotten that in its normal posi-
tion over the bladder, the intra-abdominal pressure is behind the
uterus as well as above it, and tends to force it forward. In other
words, it supports the organ.

When the cystocele has become at all marked, dysuria is pres-

ent, and considerable effort must be employed to empty the
bladder. Thus another cause for increasing the cystocele is gen-
erated. Complete evacuation of the bladder becomes impossible;
a little urine is retained and decomposes; an irritable and inflamed
condition ensues at the neck of the bladder, followed by ardor urinæ.
As the cystocele increases in size the neck of the uterus is pulled
upon more and more and the descent of the whole organ facilitated.
Thus it is that, when once the prolapse is accompanied by cystocele
and rectocele, these conditions become causes for such efforts to
empty the bowel and bladder as to still further add to the descent.

The mechanism of the pelvic floor is very simple and easily under-
stood. The practical difference in the pelvic floor between the male
and female is the additional break in the latter by the vaginal canal.
Nature has guarded this very well by surrounding the whole lower
third of the vagina with the levator ani muscle and its fascias. In its
action this muscle, when contracting, *closes* the vagina, lifts the peri-
neum, and pulls apart the fibres of the sphincter ani if the latter be
relaxed. The combined action of both muscles is to close the pelvic
outlet entirely. Whenever a nulliparous woman tightens her belly
and diaphragm, the pelvic muscles contract involuntarily, as in the

Fig. 195.

Fig. 196.



Showing effect of intra-abdominal pressure on
uterus in anteflexion with intact pelvic
floor.
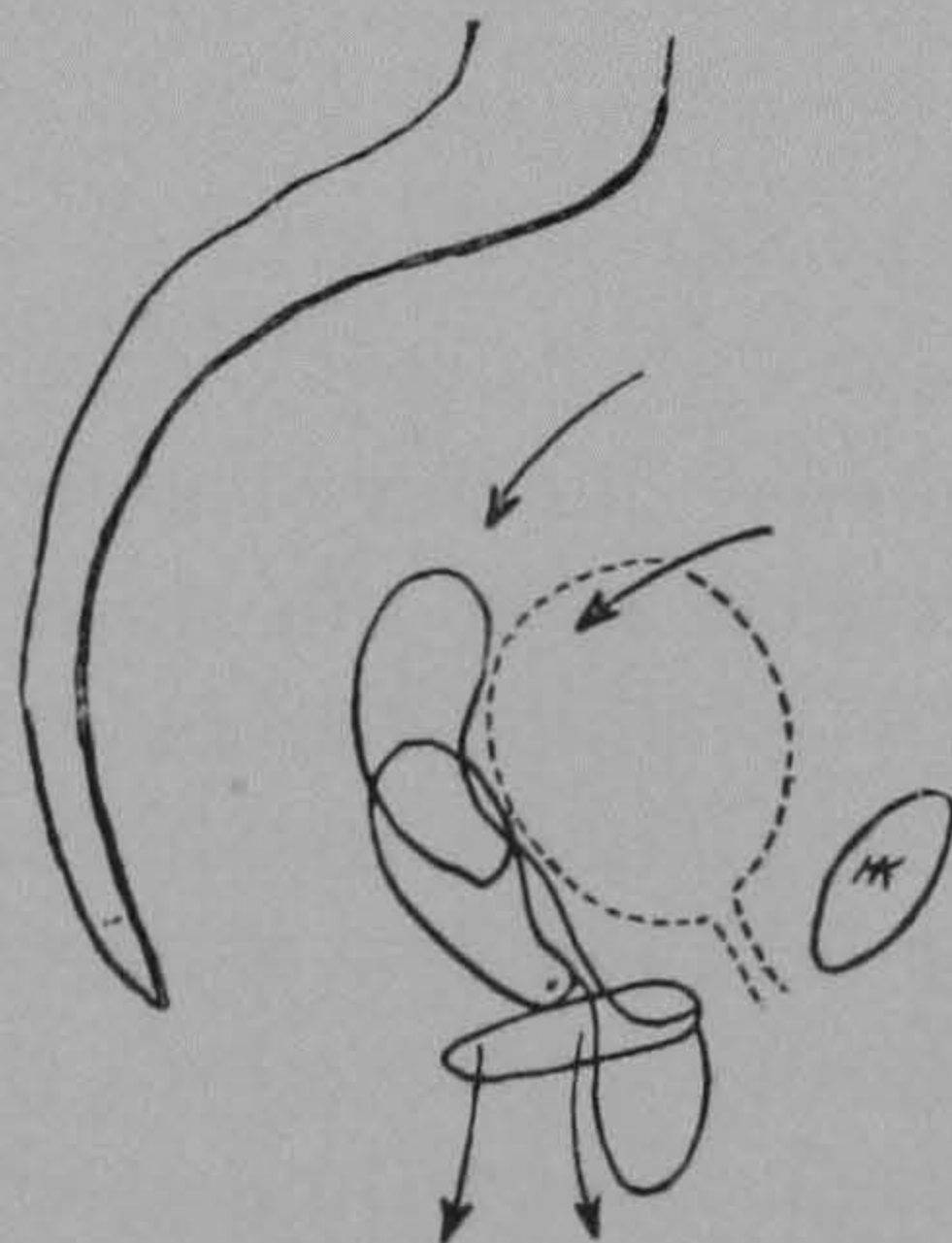
Pelvic Floor broken down, Uterus in retroflex-
ion. The intra-abdominal pressure now
increases the displacement and ends finally
in prolapsus.

various movements of the body. When such a woman defecates,
the sphincter relaxes, the levator contracts and closes the vaginal
cleft, while the rectal is open, thus preventing any marked descent
of the uterus. There is a very sufficient correlation between the
actions of the two muscles. There are other supplementary but

unimportant perineal muscles. The levator ani is covered by a
sheet of the pelvic fascia, known as the obturator fascia, which
gives it great strength.

When the fibres of this fascia and muscle are separated as in
laceration of the perineum, their ends retract gradually toward
the ischial rami of either side, producing the "angles" or "sulci"
spoken of in articles on perineorrhaphy. The older the case the
more marked is this retraction. As the rectocele comes down it
pushes out between these separated fibres.

A woman with ruptured perineum on defecating relaxes the

FIG. 197.



Illustrating the Formation of a Complete Prolapsus,

sphincter, but the levator fibres are torn asunder, and their dilat-
ing action upon the sphincter is gone. She has to strain, and as
she does so the vagina can no longer be closed by the levator, but
the rent allows the intra-abdominal pressure and the advancing
feces to force the posterior vaginal wall out of the vulval orifice,
producing a rectocele. In this way, is prolapsus produced. The
condition is rightly described as a hernia through the pelvic floor.
The result is produced gradually, sometimes taking many years to
become fully developed.

The first step in prolapsus is a retroposition of the organ. As
this increases rectocele supervenes, and in a short time cystocele.
When the uterus has descended to the vulva, it loses its retroposed
position through its attachment to the bladder, becomes more erect,
and is pulled toward the symphysis. On escaping from the body
it occupies a position in the centre of the sac. After a certain

amount of descent has taken place retarded venous circulation causes the organ to enlarge, and still more contributes to prolapse.

SYMPTOMS.—In acute prolapse there are the symptoms of great shock, signs of internal hemorrhage perhaps, and severe pelvic pain. This condition is rarely seen. Examination will readily demonstrate the lesion.

The uterus is found at or outside the vulva, covered with the anterior or posterior wall of the vagina, according as it was anteverted or retroverted before the accident. The parts are livid from venous stasis, due to pressure on the thin-walled veins in the tense broad ligaments. The patient is usually unable to urinate, owing to distortion of the urethral canal and pressure upon it by the displaced organ. The bearing-down pain amounts to agony.

In chronic prolapse, coming on gradually, the first symptoms are those of backache, bearing-down or tenesmus, shooting pains from rectum to bladder, costiveness, dysuria, pains radiating down the thighs, and absolute inability to walk; and yet a complete prolapse of many years' standing may produce no effect upon the woman, she merely complaining of the inconvenience of the mass. There may be symptoms of kidney disease from obstruction in the ureters, and the peritoneum is often involved in old cases. The erosions which occur produce an annoying discharge. The uterine walls are thickened, but the endometrium is not markedly changed. Menstruation seems as often decreased as increased, due in part, probably, to the fact that most cases occur about or after the menopause. Cystitis is not uncommon, due to incomplete evacuation of the bladder. The costiveness, the continual straining at stool, and the use of evacuants produce a proctitis, which may lead to the supposition of the existence of rectal disease only. Objectively, a tumor is found projecting from the vulva and attached to the margins of the pelvic outlet, and more or less pear-shaped with the base up. At its apex is found the os externum, into which the probe readily enters. As demonstrating the importance of drainage from the uterus, it may be mentioned that these cases, though subjected to much examination at many hands and exposed to all sorts of filth, seldom present the changes of septic endometritis, so perfect is the escape of the discharges.

If intestines be prolapsed into the posterior cul-de-sac, there may be a tympanitic percussion note at the upper border of the tumor behind.

water is merely to fill the tube when the patient is up, and thus prevent the escape of air with collapse of the bag.

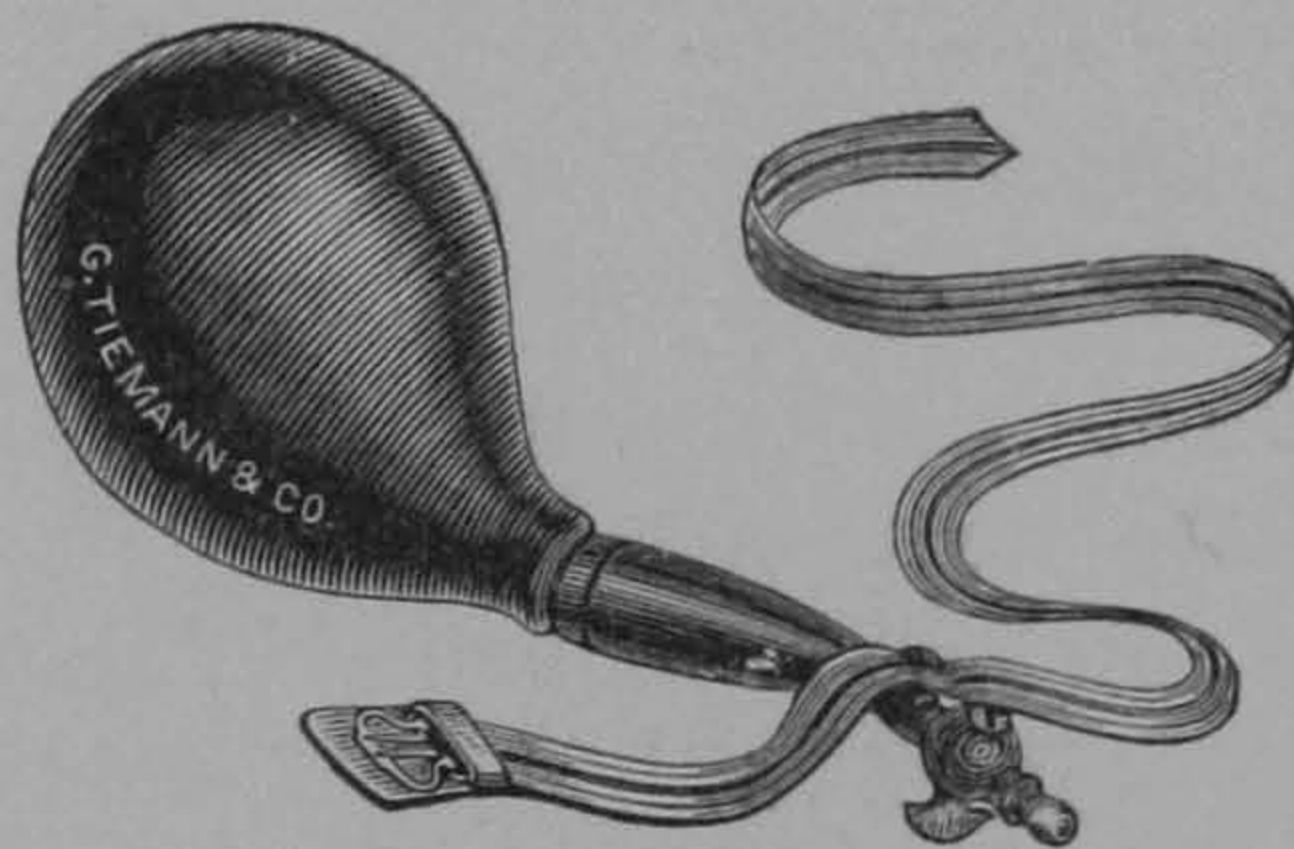The detail of the treatment of the cases of partial prolapse is

FIG. 198.
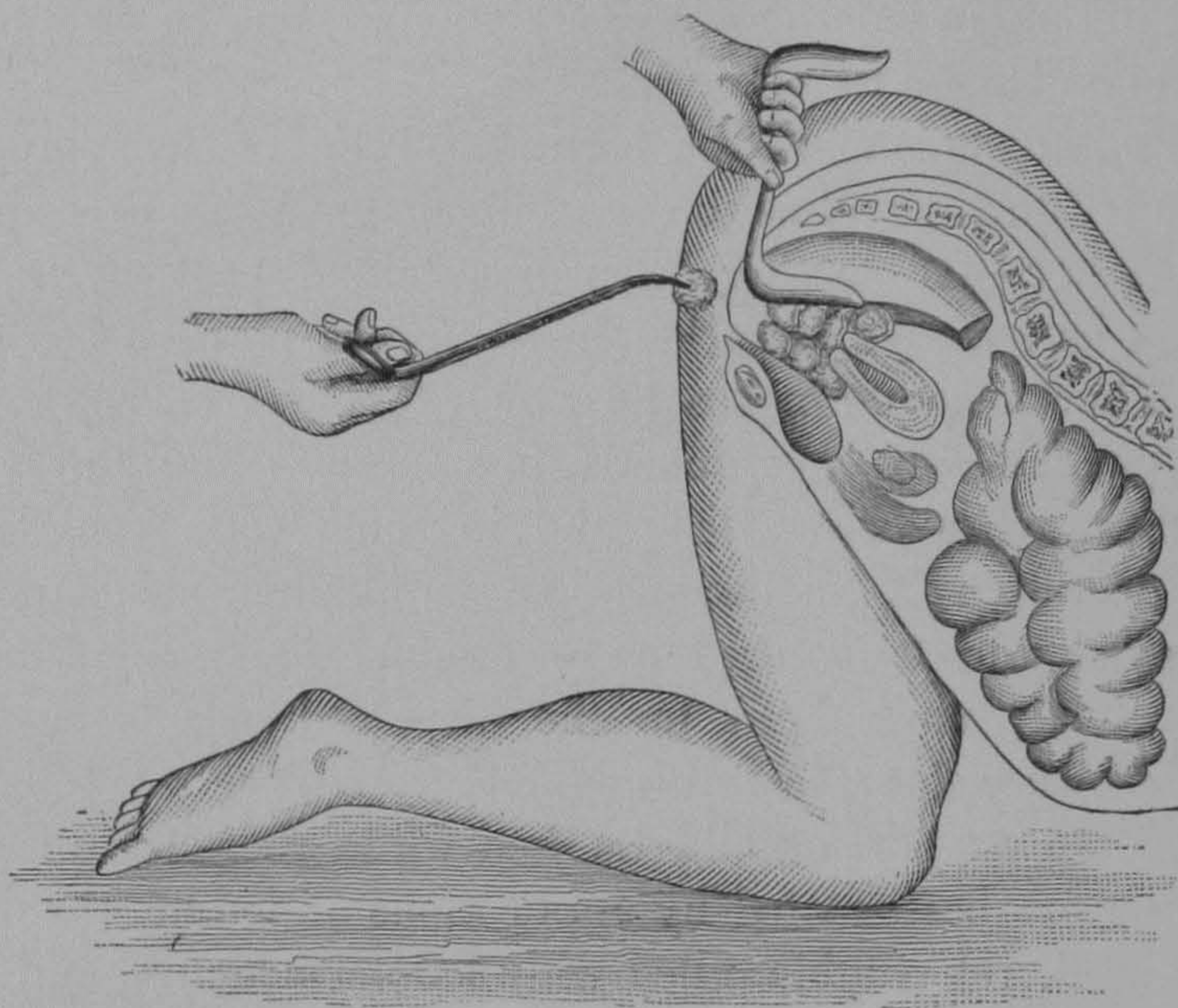


Tamponade of Vagina for Prolapsed Uterus, in the Knee-chest Position.

practically an enumeration of every known pessary and support, the physician trying one after another until one be found to suit the case or all fail.

Patients may experiment with hollow rubber balls until one is

FIG. 199.



Braun's Colpeurynter.

found which will remain in the vagina and keep the uterus within the pelvis. It should be removed each night and cleansed, to be introduced in the morning before rising.

Posture has a marked effect upon the size of the uterus, and

*also clean the vagina thoroughly + disinfect.*

Taxis = replacement.

normal position. At some point about the pedicle the finger can be passed up into the cervical canal, and even into the uterine cavity.

Strangulation of the prolapse may occur when the vulval orifice is small, the organ coming out easily enough, but so swelling from stasis as to endanger its vitality.

The PROGNOSIS is excellent, both as to relief of the symptoms by palliative treatment and as to the result of operative procedures.

TREATMENT.—It having been ascertained that by taxis the hernia can be reduced, retention in its proper position becomes our object. There are two means by which this may be accomplished. Certain patients will not submit to operation until every other known means has been tried; and in some very feeble and old patients operation is impossible. In employing mechanical supports they should be so used as to produce as little irritation as possible. They must hold up the displaced organs against not only their own weight, but also against the entire intra-abdominal pressure. No support should be used while there are ulcerations. These latter are best treated by applications of iodine, the displacement reduced, the vagina filled with iodoform gauze, and a tight T-bandage applied; or by reducing the displacement, dusting the vagina with boracic acid, and packing it with borated cotton. Having cured the ulcerations and erosions, choice may be made of a means of support. Hard pessaries must take their *points d'appui* from some bony prominence, as the natural curves of the vagina are lost and the canal is perfectly straight, incapable of retaining any pessary against the force of the intra-abdominal pressure. The only pessary which can be of any use in complete chronic prolapse is the cup pessary supported externally by a belt about the waist. This should be removed at night and a boracic-acid vaginal douche taken. Where this cannot be worn a good substitute is Braun's colpeurynter. It takes its point of support *evenly* from all parts of the pelvic outlet. Before introduction it should be thoroughly cleansed, the vagina washed with boracic-acid solution, and the bag covered by zinc ointment. Being of soft rubber, it has a tendency to excoriate the moist parts unless greased. In some patients the bowels and bladder functions continue with the inflated bag in position. The instrument retains the organs in a high position. About an ounce of water should be introduced into the colpeurynter, and the rest of the distention made with air. The

21

uterus from cornu to cornu, dipping down deeply into the muscular substance of that organ. It is best to place these sutures so that they do not penetrate all the tissues of the abdominal wall, but only the peritoneum, muscles, and deep fascia, the free ends coming out on the surface of the fascia. The ends are securely tied together, and when the abdominal walls are approximated remain buried. The sutures should be of silkworm-gut.

FREUND'S OPERATION.—In a certain limited number of cases which have passed the menopause, and in whom genital atrophy has begun, the operator may apply the procedure devised by Freund. But this operation is indicated only when it is deemed unwise to attempt plastic work, and where it is inadvisable to keep the patient in bed for any length of time.

Under narcosis the uterus is curetted and irrigated, but not packed. The uterus is left in a prolapsed position. Upon one side of the vagina, about half an inch below (above while the prolapse is present) the cervix, the operator makes a short incision through the vaginal mucosa. A stout half-curved needle is threaded with silk to carry silver wire. The needle is introduced into the cut and made to completely encircle the vagina, and is brought out at the point of entry. To it is now attached a strand of silver wire (No. 24), and this is drawn beneath the vaginal mucosa.

Half an inch lower down another incision is made in the vagina and another wire suture drawn beneath the mucous membrane. The procedure is repeated at equal distances until the vulvar orifice is reached. The lowest (highest while the prolapse exists) suture is within the vagina entirely, and is at least half an inch internal to the meatus urinarius. The sutures are half an inch apart, and all lie entirely beneath the mucosa. If possible, the operator should avoid traversing the mucous membrane, but his needle should pass beneath it. It is commonly necessary, because the needle cannot be made to entirely encircle the vagina at one sweep, to withdraw the needle twice for each suture; it should be reintroduced precisely in the aperture of exit. When all the sutures are in place the cervix is replaced sufficiently to tighten the suture nearest the cervix. When the proper degree of tension is secured the wire is closely twisted and the ends cut off outside the fourth turn of the twist. The twisted end is sharply bent and is tucked beneath the edges of the lateral incision. The uterus is further replaced, the second loop of wire is tightened so as to sufficiently pucker the vagina, the ends

twisted, cut short, and tucked beneath the edges of the short lateral cut. In this way, progressively replacing the prolapsed organ and securing the wire loops, the operator completes the operation. The vagina is irrigated with boric-acid solution and a loose filament of iodoform gauze is introduced. This is removed in two days and the vagina again washed out. The patient is allowed out of bed for a few hours after six days.

The success of this operation depends upon the degree of tension produced by each suture. The suture nearest the cervix should draw the vaginal walls together, so that the little finger will pass readily. The next suture will admit of the passage of the index finger, while the suture nearest the vulva constricts the vagina only sufficiently to furnish support to those above. The operation seeks

Fig. 200.



Freund's operation for complete prolapse: *P*, pubis; *c*, cervix; *1, 2, 3, 4*, the wire sutures circling the vagina. Both ends are shown protruding from the short lateral incisions in the vagina ready to be tightened and twisted. They are introduced and twisted in the order of their numbers.

the establishment of four permanent submucous silver-wire ring pessaries. The sutures are never removed. They should at least remain in place long enough to cause the formation of rings of con- nective tissue around the vagina. If the operator has succeeded in applying his sutures tightly enough to afford to each other mutual support, and yet not so tightly as to cause them to cut through, he will have the satisfaction of seeing his patient relieved of this most distressing condition. Coition is to be absolutely forbidden and laborious work avoided. The lateral incisions are preferable to those either upon the anterior or posterior wall, for with the first the wire knots will not lie beneath either movable hollow viscus, the bladder or rectum. The operation consumes about fifteen minutes.

*Acute prolapse* rarely occurs alone, but associated with it are other injuries produced by the same violence. It is to be treated

by gently returning the organ and packing the vagina lightly with cotton or gauze. An ice-bag to the suprapubic region will limit pain and bleeding. Symptoms of internal bleeding from ruptured ligaments should be treated by putting the patient at rest and by saline transfusion.

In old women, who may not expect conception, the preferable procedure is either Freund's operation or extirpation of the organ. The uterus may be removed per vaginam much more rapidly and with less risk to these patients than if tedious plastic work be done.

The operation should be performed with ligatures, and the stumps fastened into the vaginal opening, so as to draw the vagina upward during the process of contraction and repair, and give that organ a permanent support from above, which can be obtained in no other way.

The danger to very old women lies largely in prolonged etherization necessary to plastic work of this extent. This is not the case with the rapid hysterectomy.

Not a few failures occur in the hands of every operator to effect a cure in certain cases of complete prolapse. Where this has occurred, or in such cases as, in the opinion of the surgeon (based on experience), it is liable to occur, the operation proposed by Baldy is to be performed. The class of cases to which this method is applicable is limited to women in whom the question of future childbearing is eliminated. Other than the mortality incident to an uncomplicated hysterectomy there is no danger.

BALDY'S OPERATION.—A glance at the accompanying diagrams will disclose what is proposed.

The procedure is in all essentials an abdominal hysterectomy by amputation at or below the internal os. The points to be observed are—

To include both the ovarian arteries and the round ligament in the first ligature on each side of the uterus.

To place this ligature as near the pelvic wall as possible, so as to leave but a small amount of broad ligament behind with the stump.

To place but one other ligature on each side of the uterus, this ligature to include the uterine artery with as little other tissue as possible. This leaves both broad ligaments open.

To amputate the uterus as low on the cervix as possible.

Fig. 201 shows this part of the operation completed, together

with the second step—namely, the placing of the sutures. A glance at this illustration shows the suture *in situ,* while a glance at Fig. 202 shows the suture tied with the parts drawn into place.

It will be noted first that the suture is composed of heavy ligature silk—that in the course of its application it includes both the ovarian and uterine stumps, *deeply* placed well *back* of the ligatures. These points are important, as considerable traction occurs when the sutures are tied, and unless these precautions were taken, the suture might tear out or the ligature on the stumps become displaced.

Fig. 201.
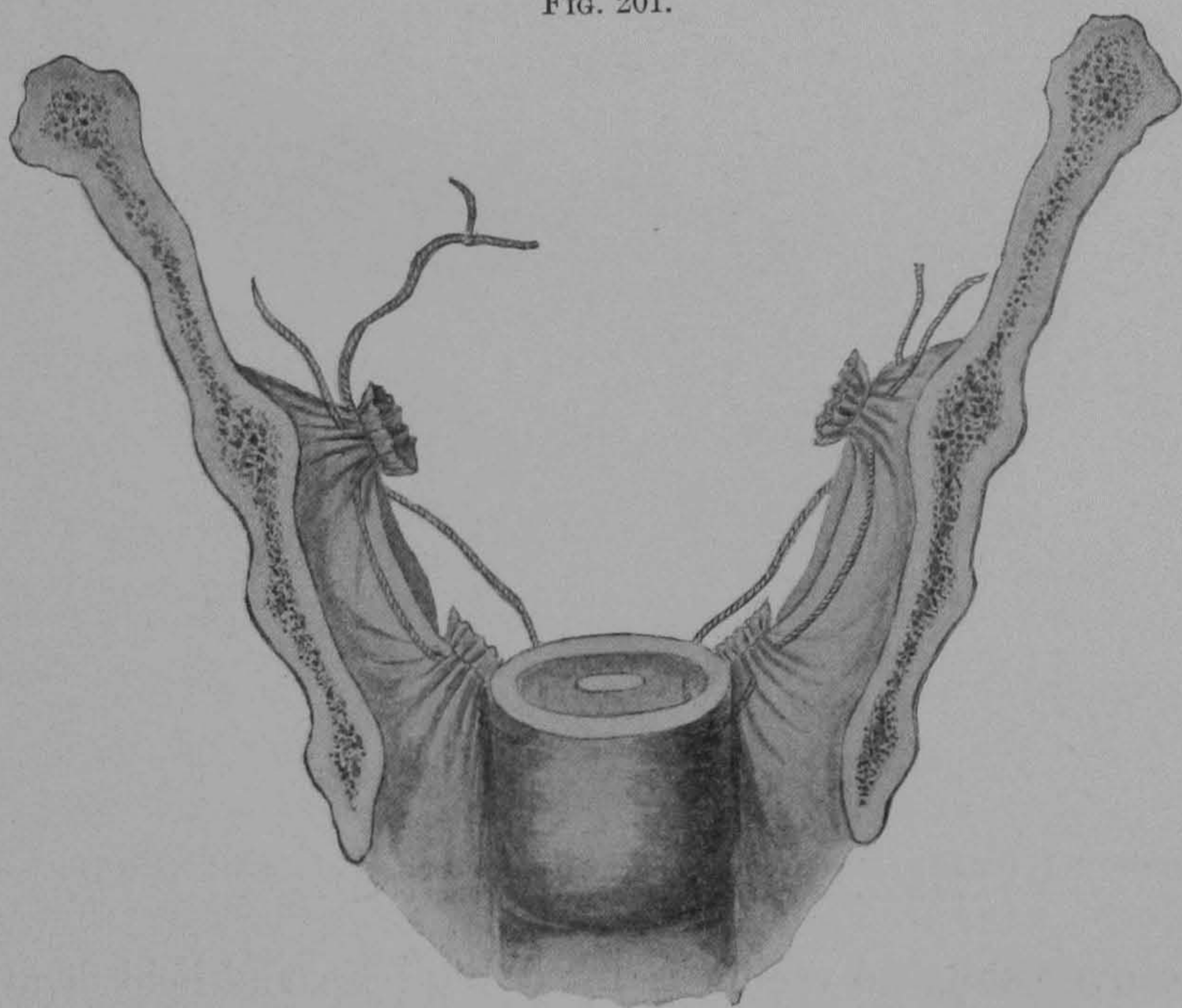


Uterus amputated. Ligatures in place ready for tying.

It will be further noted that the sutures include the sides of the cervical stump.

It can readily be seen that the effect of tying these sutures is to lift up the stump of the cervix together with the vagina, and to bring it in close approximation with the ovarian stumps, doubling the opened broad ligaments together, as shown by Fig. 202.

Of course the portion of the broad ligament at the point of the ovarian stump will be drawn down somewhat, but the main effect is to lift to a high point the cervical stump and at the same time to drag up the vagina. Adhesions take place throughout the full extent of the doubled broad ligament, and most surprisingly firm support is given from above to the vagina.

Fig. 203 shows the peritoneum drawn together by a catgut suture over that portion of the cervical stump which remains uncovered after the two sutures are tied. The abdominal incision is closed in the usual manner and the usual dressings applied.

The result of the operation is as near perfect as is possible by any operative procedure.

The results accomplished are—

The weight of the heavy uterus is removed.

Fig. 202.
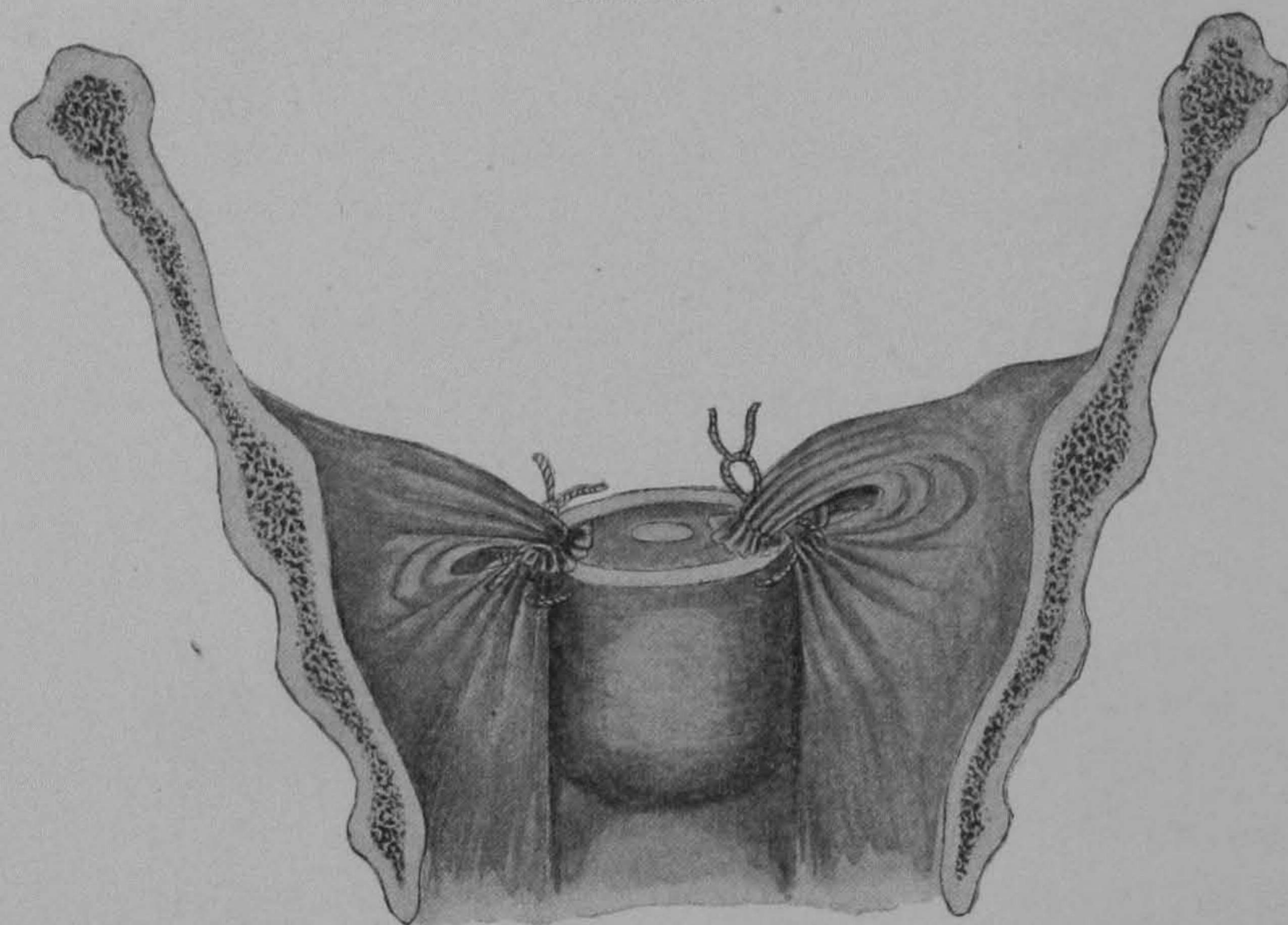


Ligatures tied; lifting up cervical stump; approximating cervical stump and ovarian stumps. Broad ligament doubled upon itself, burying uterine stumps.

The over-stretched vagina is lifted high up and held firmly in place.

The supports utilized are the natural supports of the uterus and upper portion of the vagina—the broad ligaments.

The cervix remains a pelvic organ, as is natural to it.

The immediate and remote result as regards fixation of the upper part of the vagina is perfect.

The plastic operations on the vagina already recommended are absolutely essential as an adjunct to this as well as to any other similar procedure, for the reason that unless we remove the causes which produced the original prolapse we can hardly hope to escape a relapse, however well the work above may be conceived and executed.

In cancerous or tubercular disease of the uterus the operation

may be varied by performing a pan-hysterectomy. The vaginal mucous membrane is to be whipped together, closing off the vagina. The cut edges of the broad ligaments should be whipped together on both sides down to the former site of the cervix. The raw sur-

Fig. 203.
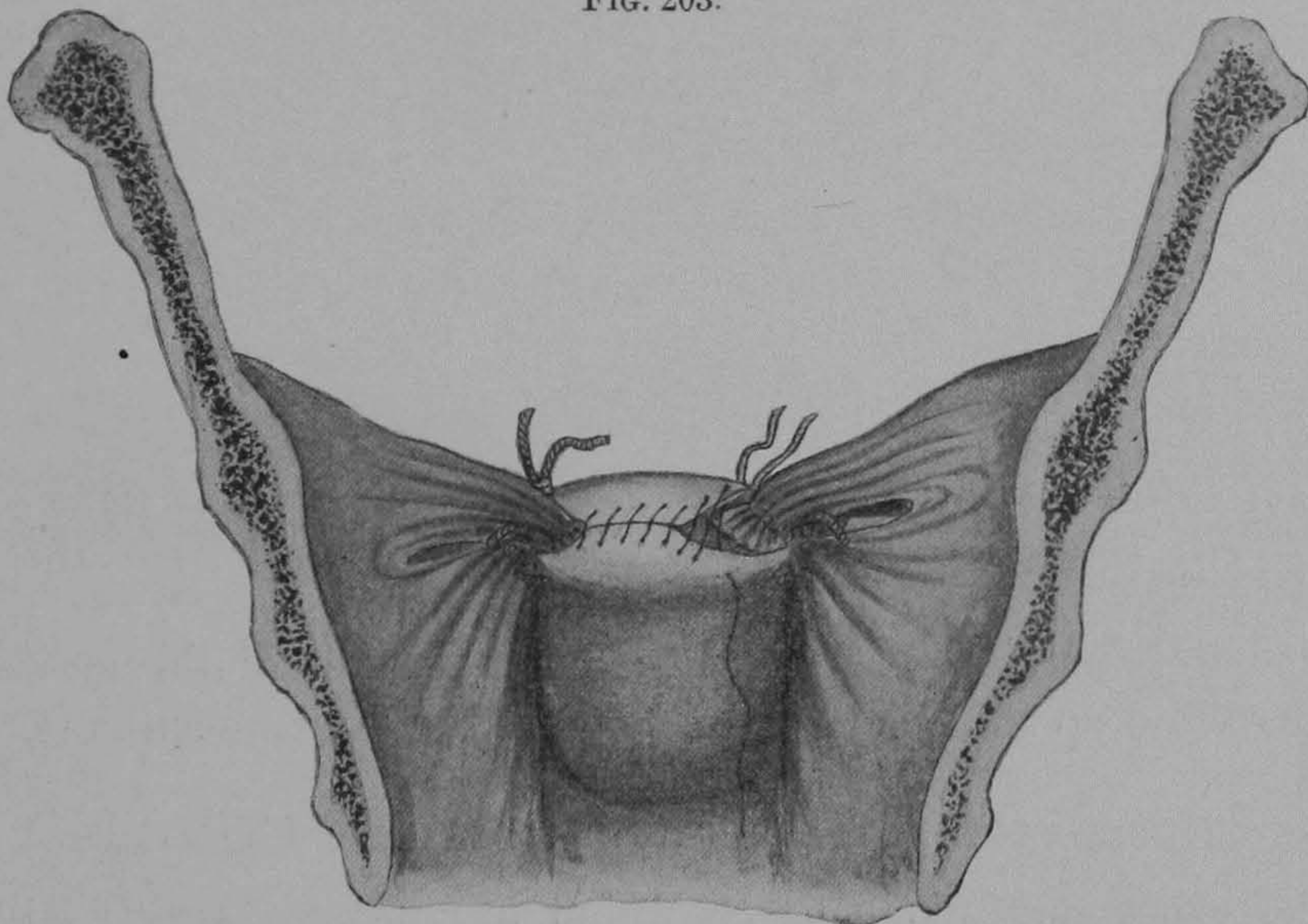


Peritoneum whipped over all, closing the wounds outside the peritoneal cavity.

face at this point can then be brought up and fastened to the abdominal wall in a similar manner as when the cervix was not removed.

This operation may be performed in any case which necessitates either a double ovariotomy or a hysterectomy, complete or incomplete, when in the opinion of the operator a subsequent prolapse of the vaginal vault may occur.

Another and excellent modification of this operation is, after the uterus has been removed by amputation at or below the internal os to fix the cervical stump to the abdominal wall at the lower angle of the abdominal incision by means of two silkworm-gut sutures passed through the full width of the cervix from side to side, and the free ends brought through the peritoneum, muscles, and deep fascia of the abdominal wall, where they are securely tied together, cut off short, and the knot buried when the incision is closed. The opened broad ligaments should be closed by a continuous catgut suture on each side, preferably before the cervix is anchored by its fixation sutures. The abdominal wound is then to be closed in the usual manner. This operation is to be chosen when a very large

Fig. 204.
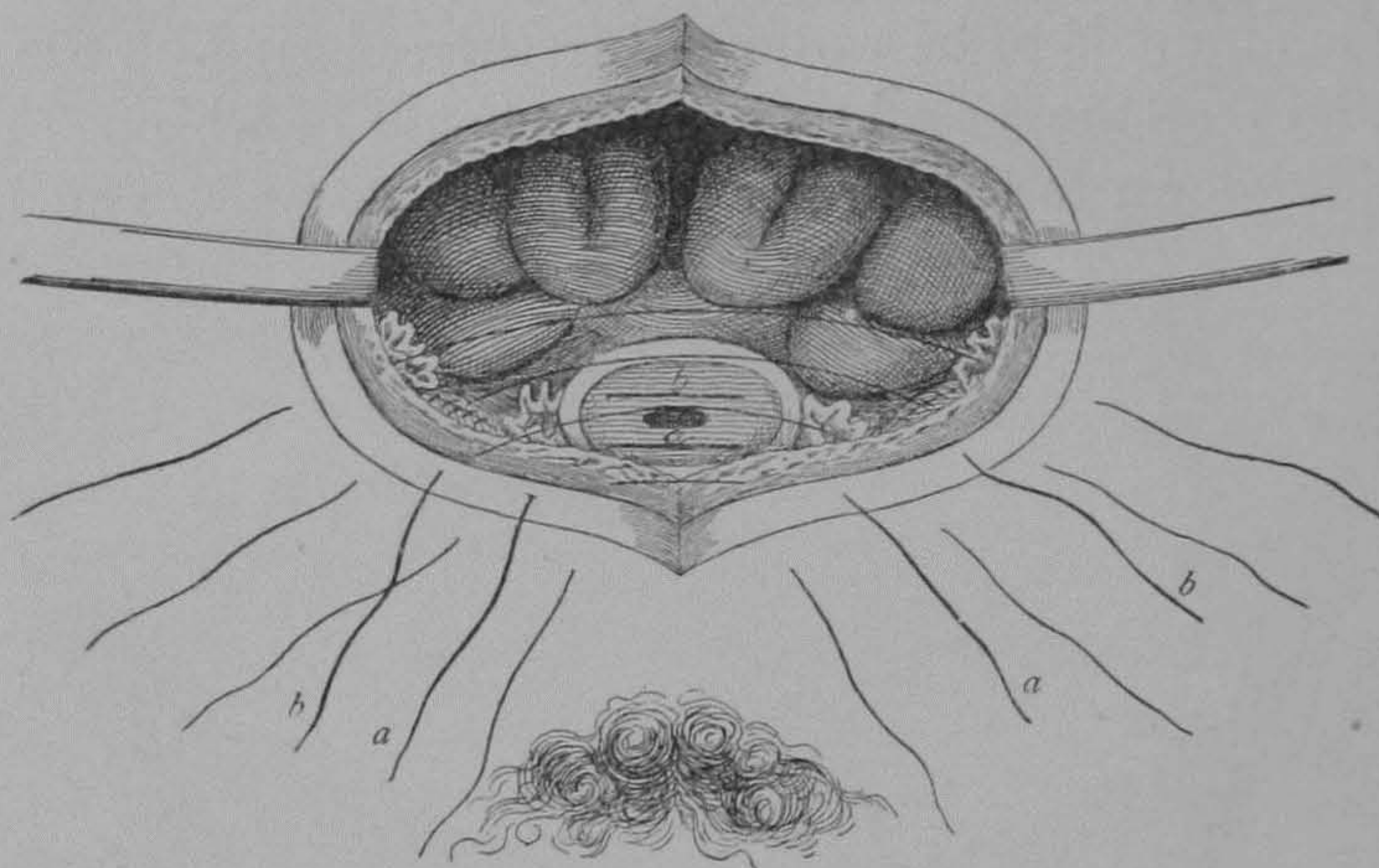


Fixation of Cervical Stump to Abdominal Wall after Hysterectomy. Heavy lines, *a, a,* and *b, b,* indicate sutures passing into fascia. through muscle and peritoneum, thence through the amputated stump of the cervix, and finally through the peritoneum, muscle, and fascia of the opposite side. Light lines indicate sutures to close abdominal wound.

amount of relaxation exists, and the vaginal vault would not otherwise be lifted up sufficiently high to give the requisite support.

## SUPRAVAGINAL HYPERTROPHY OF THE CERVIX.

The exact causes of this condition are unknown. It will be remembered that in early infancy the cervix alone exists, there being no corpus. It is possible that some excitant gives the cervix a false start about puberty, and it grows in an entirely disproportionate degree. The condition is to be distinguished from the other forms of cervical hypertrophy already described. It is characterized by an inordinate hypertrophy of that portion of the cervix which is attached to the bladder. So great is this hypertrophy that the increased weight of the uterus causes it to prolapse. The condition is peculiar to the nulliparous or primiparous, and is only occasionally found in women who have borne children. With the exception of acute prolapse produced by violence, this is the only form found in nulliparous women. The uterus descends because of its great weight. As it comes down displacement of the upper part of the vagina takes place first, whereas in the prolapse of the multiparous the rectocele and cystocele precede the descent of the uterus. When the prolapse has become complete so that the entire vagina is turned inside out, yet will a part of the fundus remain within the pelvic cavity. The essential pathological condition is one of hypertrophy of the cervix above its insertion into the vagina. This is not due to inflammatory action, but is rather an excess of normal elements.

The changes in the vagina and bladder are here the same as in the other form of prolapse. Owing to the small size of the vulva the tumor is constricted above at first, but in long-standing cases the vulvar orifice is fully distended. The base of the tumor is above, the apex below. The sound in the urethra and finger in the rectum show that the corpus lies between. The sound in the uterus will demonstrate its great length. As the patient lies on her back the marked difference in shape between the two kinds of prolapse becomes apparent. Here the pelvic floor is intact, and there is no true rectocele, no redundant vagina. Consequently there is absence of that puffy ending to the mass which is observed in the prolapse of multiparæ. In prolapse due to cervical hypertrophy the vaginal walls leave the cervix at an acute angle. The cervix is not lacerated, but rather conical.

SYMPTOMS.—These are the same as those of the other forms of chronic prolapse. Reduction is not as easy as in true prolapse, owing to the greater amount of uterine tissue relative to the size of the vagina, and complete replacement within the body to the length of the vagina is not usually possible. Straining does not materially increase the displacement, and, conversely, the dorsal decubitus does not lessen it. The general mobility is less than in true prolapse. The physical characteristics are stated above.

TREATMENT.—This must remain purely of a surgical nature. Palliative measures which afford relief in true prolapse are here useless. The cervix must be removed by high amputation as described in the chapter on Malignancy, so that sufficient tissue may be taken away. While the wound is healing the uterus must be kept in the pelvis by vaginal tamponade of gauze. After the union is firm and the sutures are removed the anterior and posterior walls may be narrowed by making on each an oval denudation. The immediate decrease in size obtained does not represent the ultimate decrease, for involution of the organ proceeds some time after the operation of amputation, and the uterus continues for some time to get lighter and smaller. If necessary at a subsequent time hysterorrhaphy may be performed.

## INFRAVAGINAL ELONGATION OF THE CERVIX UTERI.

Infravaginal elongation of the neck of the uterus occurs as a complication of prolapsed uteri, of lacerations of the cervix, and

as a congenital condition.  The elongation in the first two varieties is merely apparent, and will not be considered.

In prolapsus, as the uterus descends, the vaginal vault folds back over the supravaginal portion of the cervix and gives it the appearance of actual elongation.  By placing the patient in the knee-chest position the uterus falls back into the pelvic cavity, the uterus and vagina assume their natural relations, and the apparent elongation of the cervix disappears, showing at once the true condition.

In lacerations of the cervix one lip is oftentimes partially absorbed and everted, giving the cervix the appearance of being elongated.

Congenital elongation of the cervix is comparatively rare.  The narrow conical cervix of a non-fully-developed uterus is often mistaken for this condition.  Such a cervix is really not elongated, but is seemingly so from its peculiarly narrow, tapering shape.

A true elongation of the cervix is always congenital.  It may consist of an increase in length from half an inch to a protrusion from the vulvar orifice.  Frequently the examining finger comes in contact with it immediately on passing into the vagina.

FIG. 205.



Elongation of Infravaginal Portion of Cervix.

The symptomatology consists wholly in sterility, unless the descent be sufficient for its protrusion into the vulva, when the presence of the tumor will usually be detected.  Under these circumstances coition would materially be obstructed.  The diagnosis is easy. It may be mistaken for a prolapse, an inversion, or a polypus.  A digital examination of the vagina will show the tumor to be continuous with the true cervix, and in no way different from it.  Inspection as well as examination by the finger discloses the os.  A bimanual examination with the finger in the rectum will reveal the corpus

uteri in its normal relation and position and the vaginal mass perfectly continuous with it. These points being ascertained, there can be no excuse for a mistaken conclusion.

The treatment consists in a simple or wedge-shaped amputation of the cervix at a point about an inch from the vaginal attachments. A description of the operations will be found below.

## PLASTIC OPERATIONS.

The partial extirpation of the cervix may be performed by two methods : either by a simple amputation of that part of the cervix projecting into the vagina or as a modified wedge-shaped excision.

*Simple amputation of the cervix* is less desirable than that by the wedge-shaped excision, on account of the greater accompanying

FIG. 206.
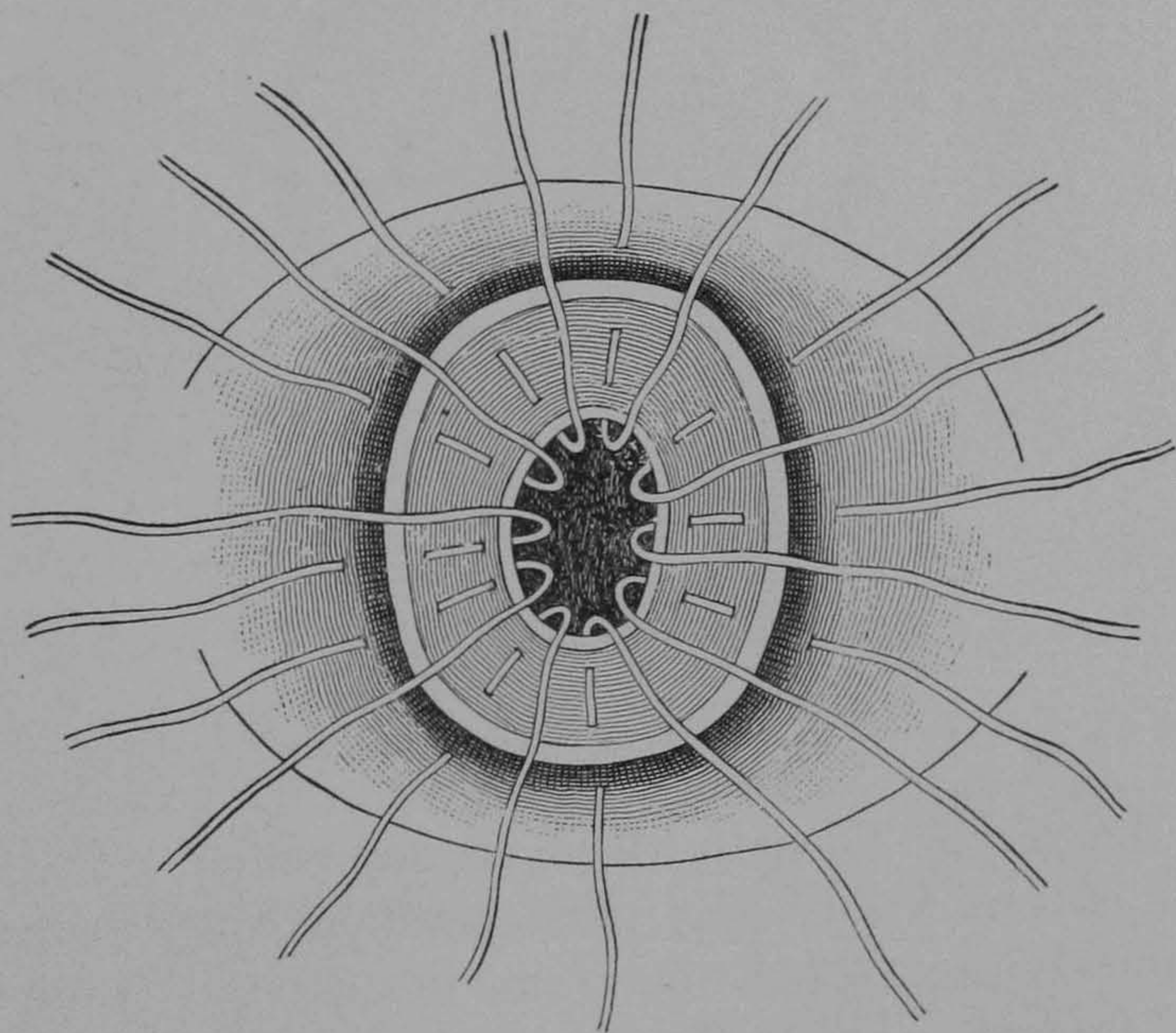


Simple Amputation of the Cervix, stitches in situ.

hemorrhage and the greater difficulty in covering the stump. The operation is performed as follows : The cervix is exposed by a perineal retractor and grasped by a double tenaculum or volsellum forceps. The labia are held apart by two other retractors, and the womb is then drawn down as far as the elasticity of the uterine ligament will permit. The farther this is possible the easier is the operation. Great care must be observed in applying traction, however, when inflammatory changes coexist in the adnexa. The mucous mem-

brane is incised by a circular incision, and the cervix severed as far as the canal.    Before the entire separation it is advisable to place one or two stitches in the severed wall, leaving the ends long. These control the bleeding and act as tractors after the cervix has been completely severed.    Tractors are applied by some operators before beginning the operation by passing a strong silk thread

Fig. 207.
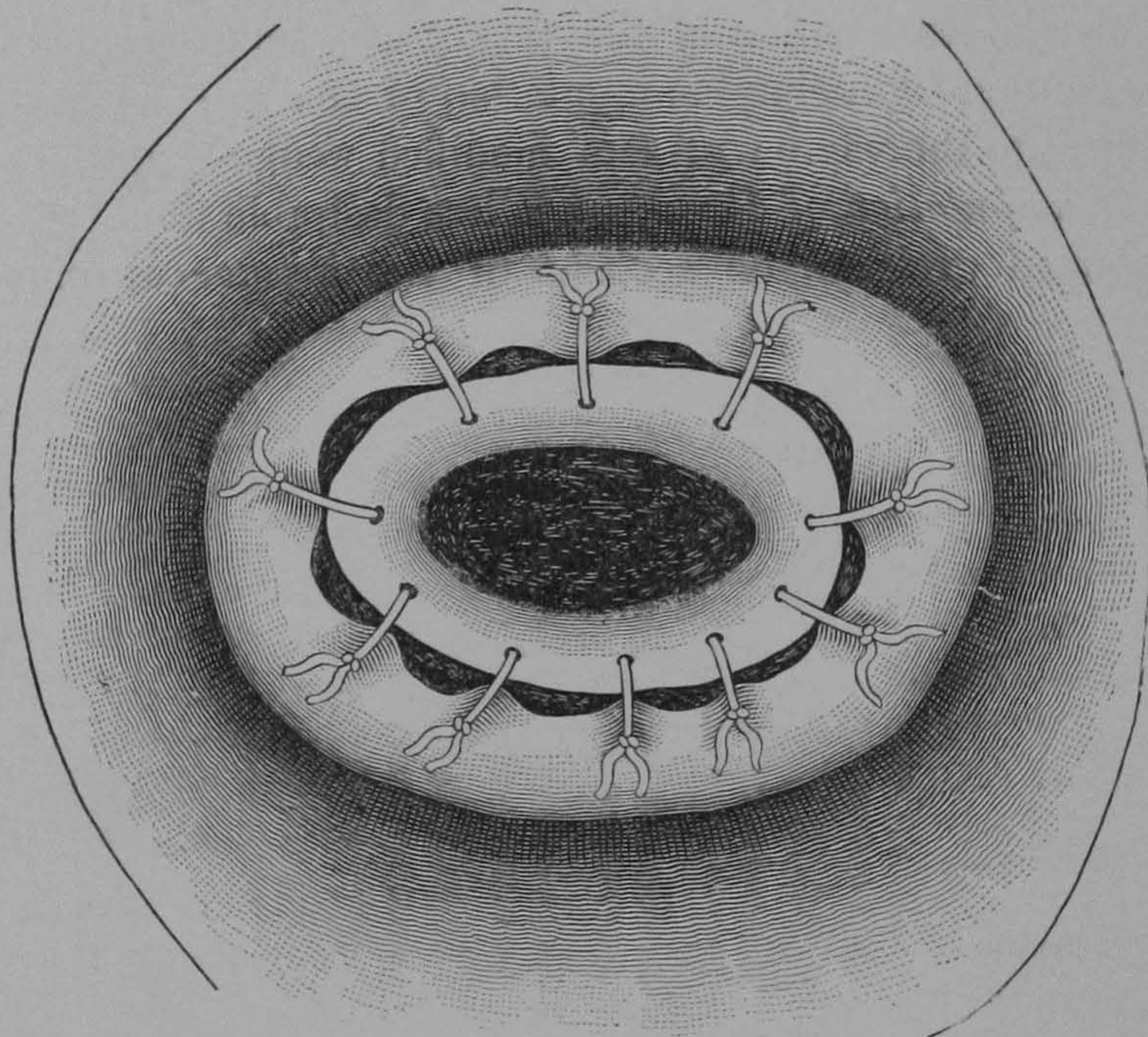


Simple Amputation of the Cervix, stitches tied.

through the cervix above the field of amputation.    The womb is now held fast by the tractor, the separation completed, and the sutures quickly placed, radiating from the cervical canal like the spokes of a wheel.    The union of the two mucous surfaces over the stump is facilitated if the needle be introduced in the cervical mucosa, brought out midway between the cervical mucosa and the vaginal mucosa, and again introduced through the vaginal mucosa.    As the circumference of the circular edge of the vaginal mucous membrane is much larger than that of the mucous membrane of the cervical canal, and the tissues of the cervix are very hard and unyielding, exact coaptation and a smooth line of suture are never attained.    The vaginal mucosa is always thrown into folds radiating from the cervical canal, but good union is ultimately obtained.

*Wedge-shaped Amputation of the Cervix.*—The uterus is curetted, irrigated, but not packed.  Pulling the cervix down by means of one pair of bullet-forceps fastened into the centre of the anterior lip and one pair in the posterior lip, the operator splits the cervix

FIG. 208.



Profile of the Wedge-shaped Amputation of the Cervix Uteri, sutures in place.

from side to side.   The cut extends from the internal os, or a little higher than the amputation is to go, out upon each side to the vaginal junction.   This produces two flaps, an anterior and a posterior. Upon the anterior flap, at a point as high as the amputation of the mucous membrane of the cervix is to extend, the operator cuts into this flap for a depth of a quarter of an inch across the entire face of the flap.   The knife is now drawn across the vaginal face of the anterior flap, and this cut is made to reach the bottom of the first. By this last procedure a wedge is removed from the anterior flap, and the anterior is converted into a double flap with a shorter portion or " bench," made by the first cut, and a larger portion composed of the unamputated part of the anterior flap.

The same maneuvre is employed upon the posterior flap.

A needle is now entered upon the anterior flap at the centre of the cervical canal, passing entirely beneath the " bench."   It is

withdrawn, and is inserted into the raw surface of the anterior flap, and emerges at the edge of the vaginal covering of this portion.
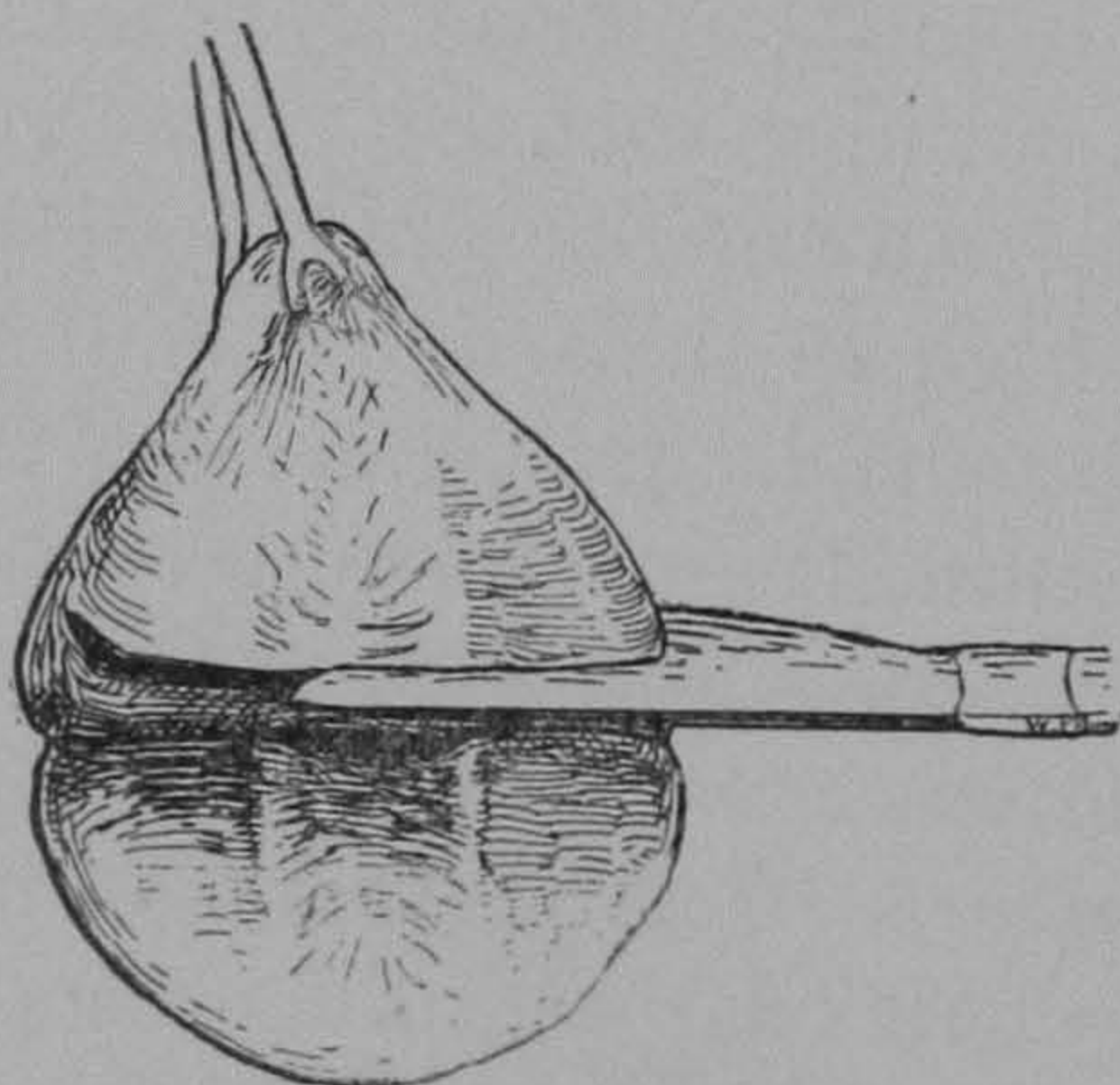
FIG. 209.
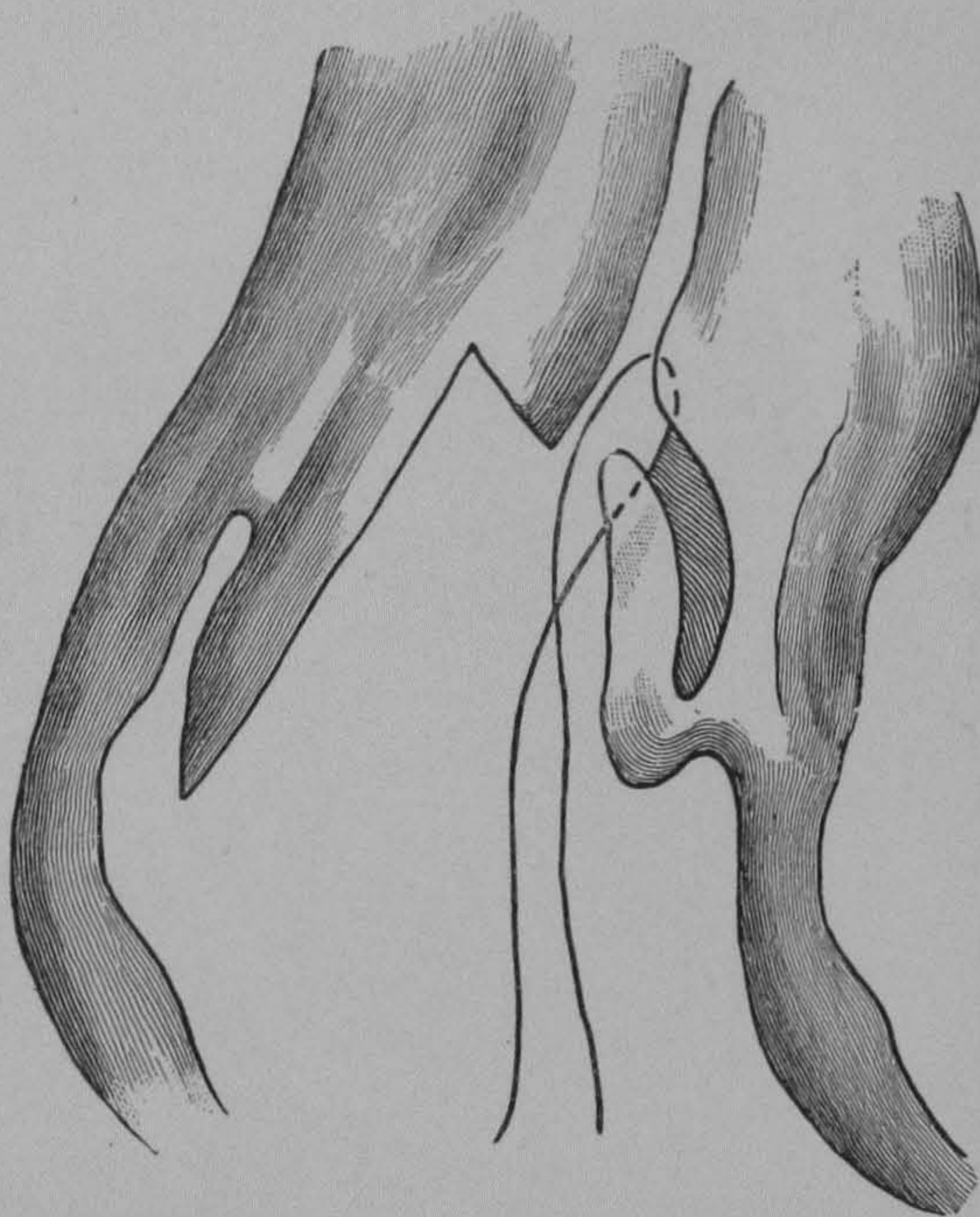


Profile of the Wedge-shaped Amputation of the Cervix Uteri, sutures ready to tie.

Two more sutures are similarly passed, one upon each side of the first. When these sutures are tightened it will be seen that the vag-

FIG. 210.

FIG. 211.



The cervix has been split bilaterally. and the anterior flap is held up. The knife is cutting the "bench" upon the anterior flap. (Sketched from nature.)
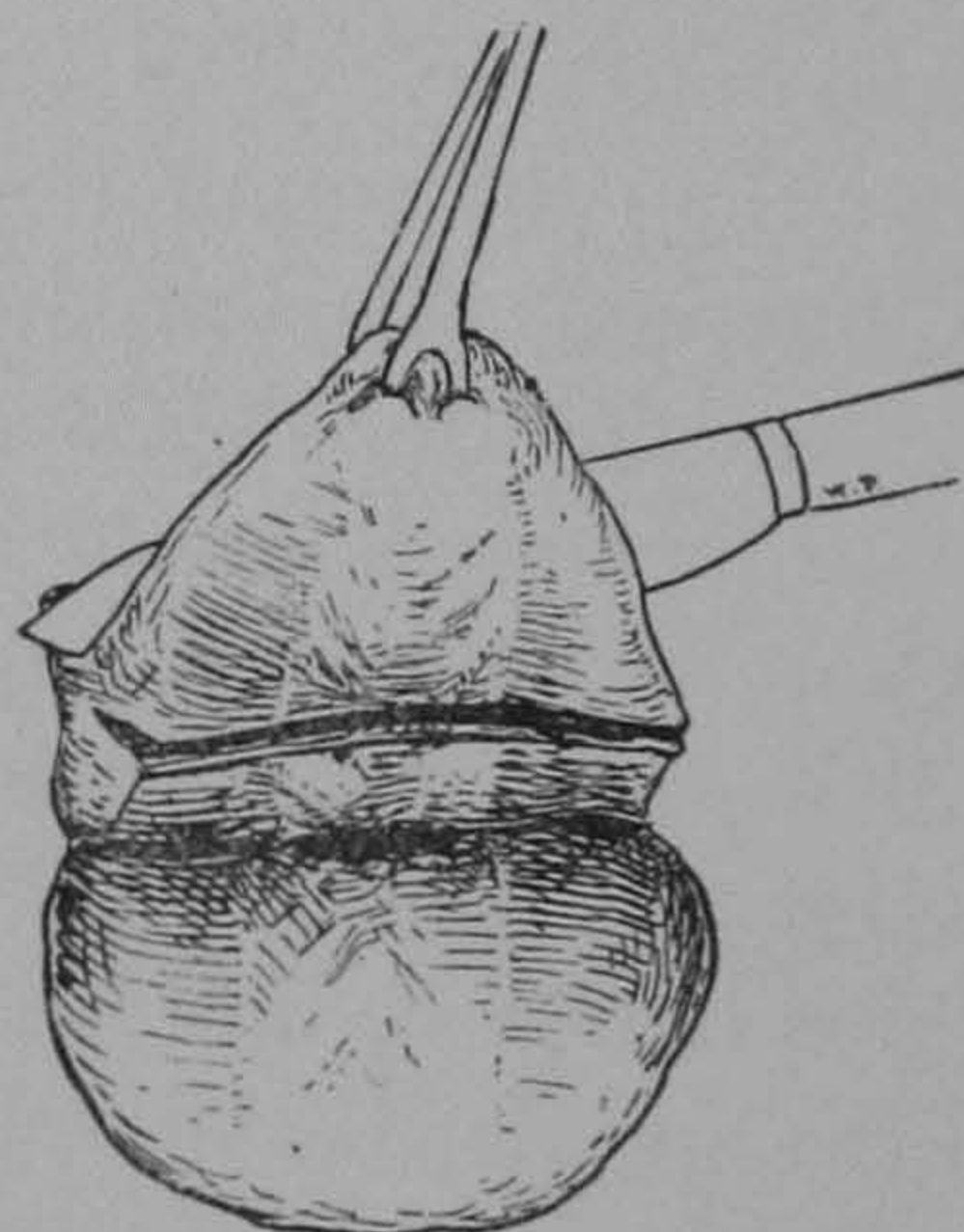
The knife is amputating a portion of the anterior lip by a cut which joins the cut forming the "bench." (Sketched from nature.)

inal face of the anterior flap is folded over upon the anterior cervical mucous membrane. This makes provision for the anterior portion

of the future os externum. The same thing is done upon the posterior flap, and the entire new external os is made. It will now be seen that the lateral portions of both " benches " are redundant. These are cut away with scissors down to the bottom of the incision,
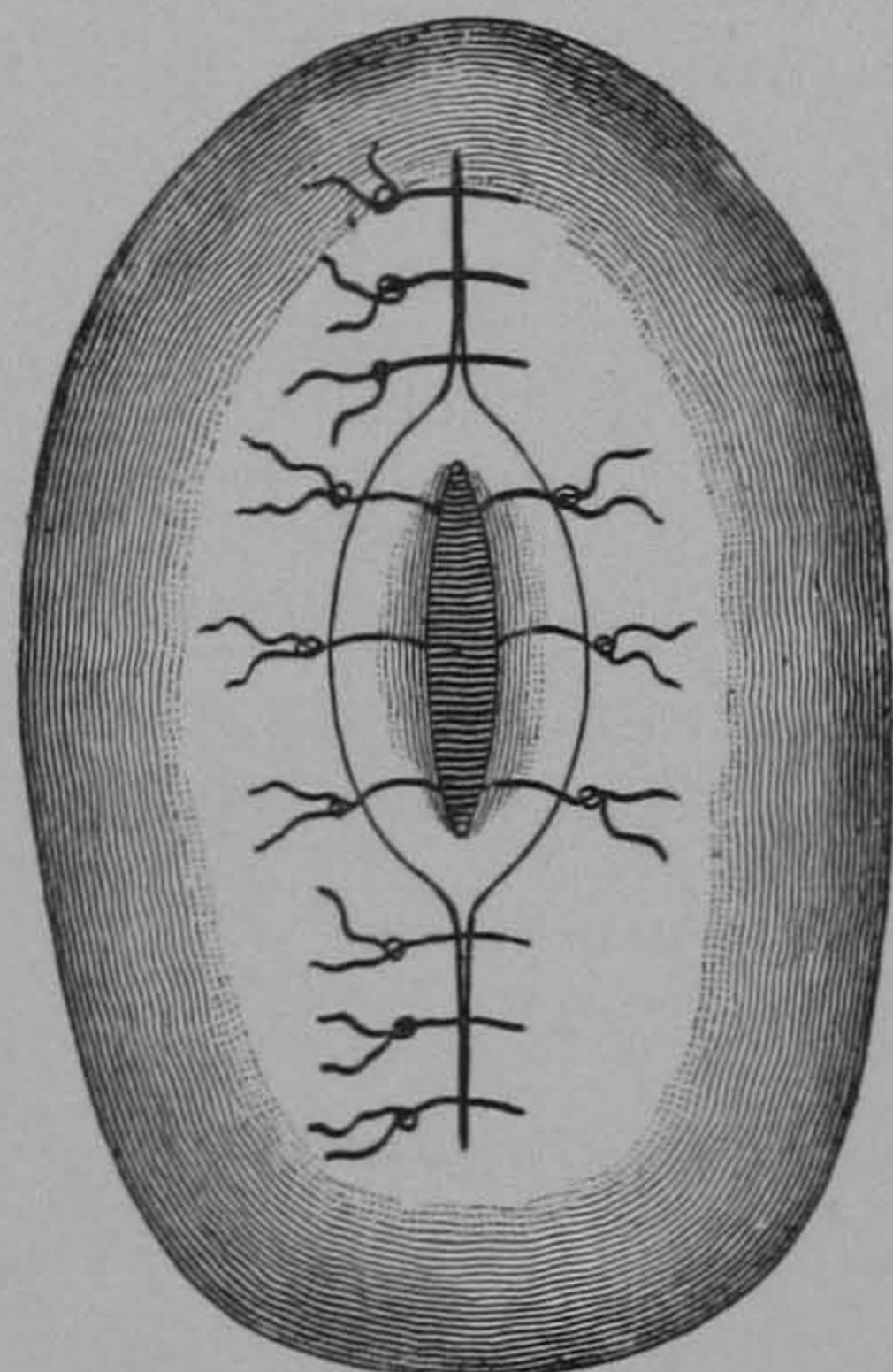
FIG. 212.
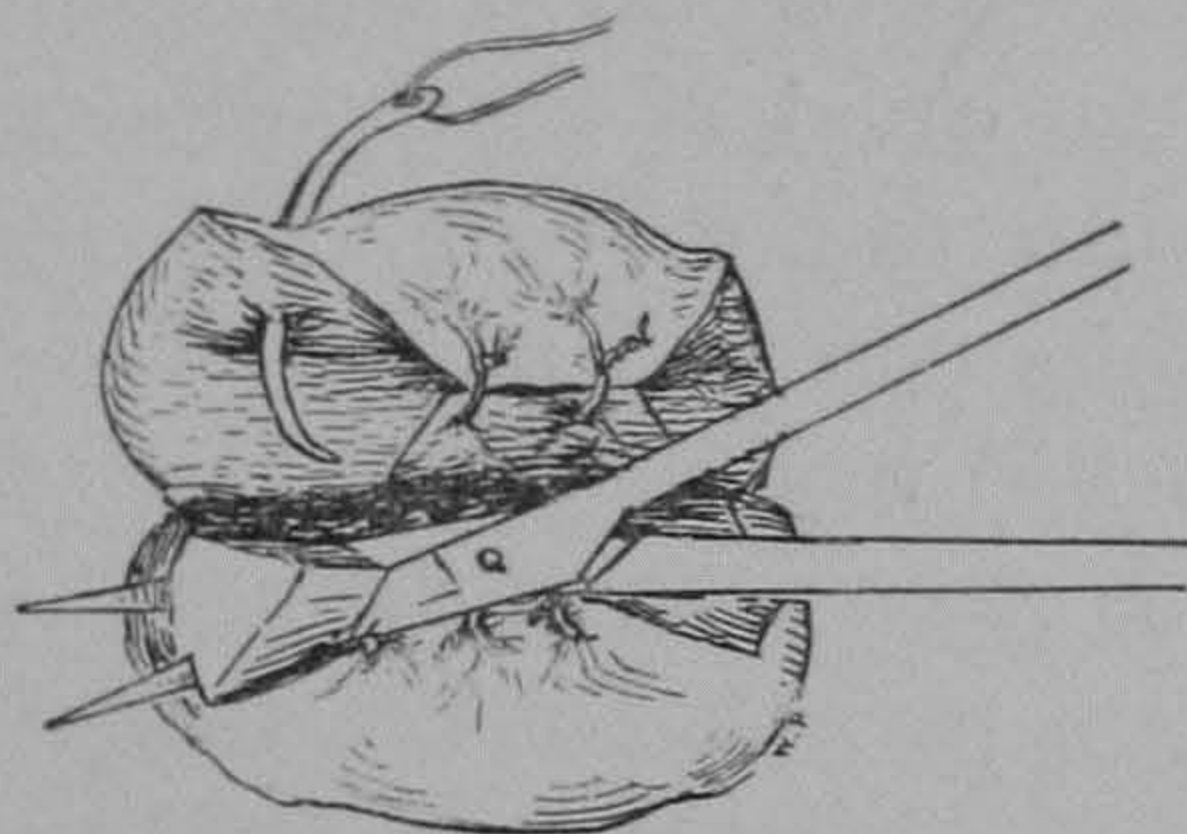


The middle sutures have been inserted on the anterior lip, and the redundant " bench " at each angle is cut away. Upon the posterior lip the scissors are cutting away the excess of the " bench."

so that at the angles there will remain but two smooth flaps, an anterior and a posterior. These are approximated by sutures passed from before backward, each suture being entirely buried. In applying these through-and-through sutures it may be necessary to bring the needle out several times at one sweep. The needle cannot em-

FIG. 213.



Wedge-shaped Amputation of the Cervix, sutures tied.

brace all the tissue of both lips of the cervix. The first introduction and withdrawal of the needle is shown in Fig. 212.

When the operation is completed the appearance will be as shown in the illustration (Fig. 213).

If, after completing the external os upon each lip, the " benches "

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were left undisturbed, the through-and-through sutures upon each side of the cervical canal would bring together four projections of tissue. To avoid this and limit the possibility of failure to get union, the benches upon each side of the canal are cut away as described.

Having completed the operation and holding all the sutures to steady the cervix, the canal is gently dilated, the uterine cavity again washed out with salt solution, and packed with iodoform gauze. The sutures are now tied and their free ends cut off. The vagina is snugly packed with iodoform gauze. On the third day the vaginal dressing is removed and the uterine packing withdrawn. The uterus is not again packed, but the vagina is.

The vaginal dressing is changed once in three days, and the sutures are removed in from ten days to three weeks. If the vulvar orifice be tight enough to retain the iodoform gauze dressing within the vagina, the patient is allowed out of bed in six days. But if there be risk of dropping the vaginal dressing, so that mobility of the uterus will follow, she had better remain in bed until the sutures are removed.

The operator seeks to remove two-thirds of the hypertrophied vaginal portion of the cervix. He leaves none of the diseased tissues, cysts, etc. which trachelorrhaphy fails to remove, because of the necessity for leaving a central portion upon each lip which that operation requires in order that a cervical canal may be retained. Subsequent pregnancies progress normally so far as the cervix is concerned. It will be further noticed that this operation provides a cervical canal slit-like in form, and not a round tubular canal, such as is secured by trachelorrhaphy. Whenever there is much cervical hypertrophy of a chronic character, with or without laceration, this operation is recommended.

Where a purulent endometritis coexists with a degree of cervical disease necessitating an amputation, it is not wise to curette and amputate at the same sitting. Either the curettage should be done a week before the amputation, or the operator should control the endometritis by means of irrigation with large quantities of mild antiseptics, such as boric-acid solution, together with the use of gauze tamponade of the uterus, before doing the amputation.

*Anterior Colporrhaphy (Sims').*—A point just posterior to the urethra is marked, and another in front of the cervix. With tenacula the lateral walls of the vagina, midway between cervix and

urinary meatus, are brought together. If they can be approximated too readily, the tenacula should be placed farther to the sides. The object is to catch up the sides of the anterior vaginal wall at points which may be approximated without too much strain. These being determined, they are marked. The four points thus chosen are united by an oval line, the greatest diameter of which is at the middle of the vagina. But this rule is not invariable, and the greatest width may be made where there is the most slack. Den-

FIG. 214.
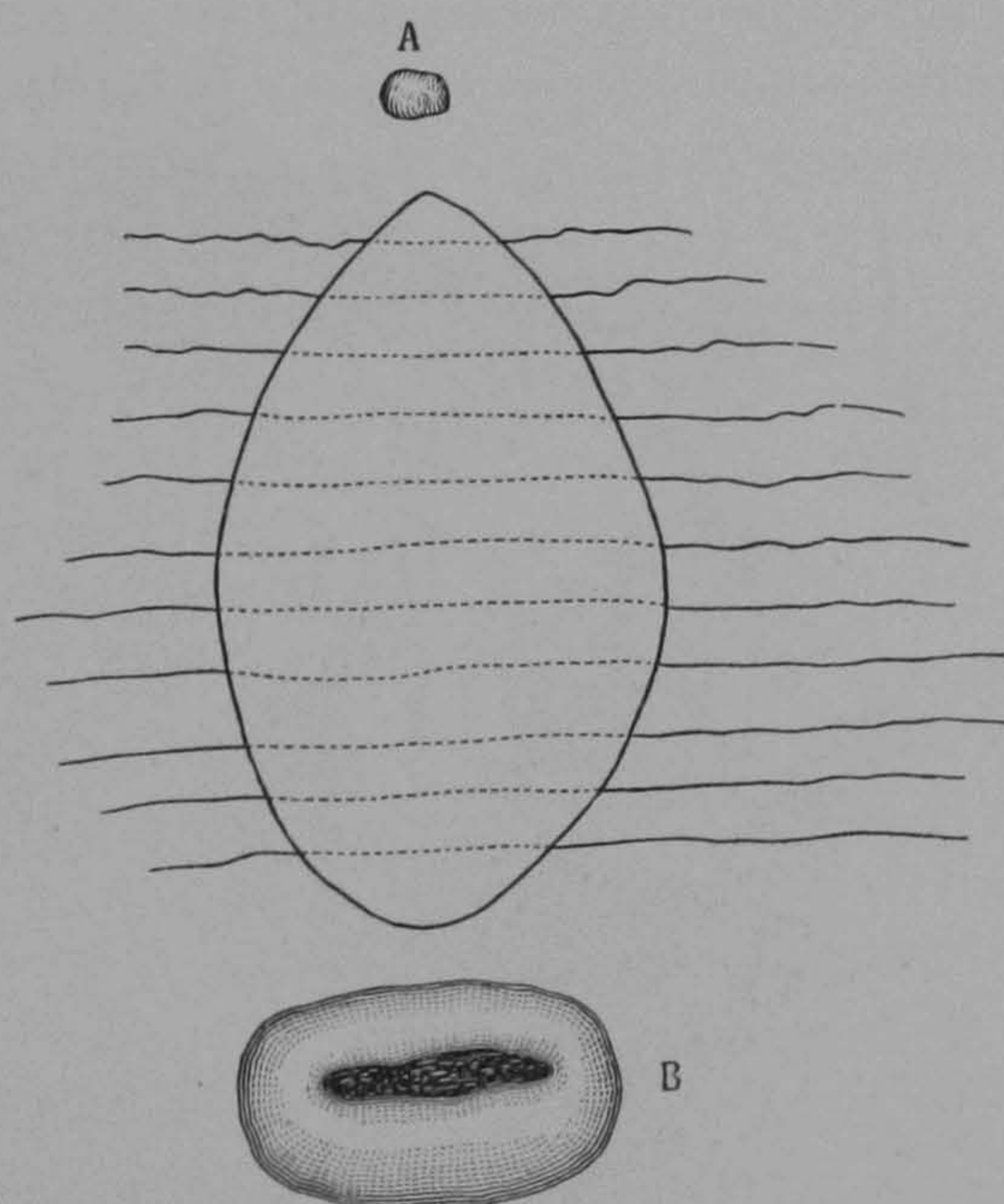


Sims' Anterior Colporrhaphy, stitches in situ: A, urethra; B, cervix.

udation is made by cutting with scissors. The operation is exceedingly simple and easily performed. The sutures are catgut and are passed from side to side. A double row of continuous sutures is used, the first row being placed entirely within the denuded surface, narrowing it fully one-half and removing considerable of the tension on the row approximating the mucous-membrane edges. The second row brings the edges of the incision together, burying the former suture. This is the preferable operation when it is desired merely to narrow the vagina. It does not foreshorten it, as does Stoltz's operation. It is a valuable adjunct to other procedures adopted for repair of the pelvic floor and reduction in the calibre of the vagina.

*Colpo-perineorrhaphy* (Hegar).—The object of this operation is
to unite the separated ends of the levator ani muscle and pelvic
fascia, to push the rectocele upward, and to narrow the vagina.
Although the surfaces denuded by this method do not resemble the
freshly-torn perineum, yet it must not be overlooked that we deal
with torn perinea when they have acquired two elements never pres-
ent in fresh tears—viz. the rectocele and retraction of the divided
muscular and fascial edges. We carry out this indication to such
an extent that we have extended the line of denudation higher than
Hegar does. The divergence between the separated fibres of the

Fig. 215.
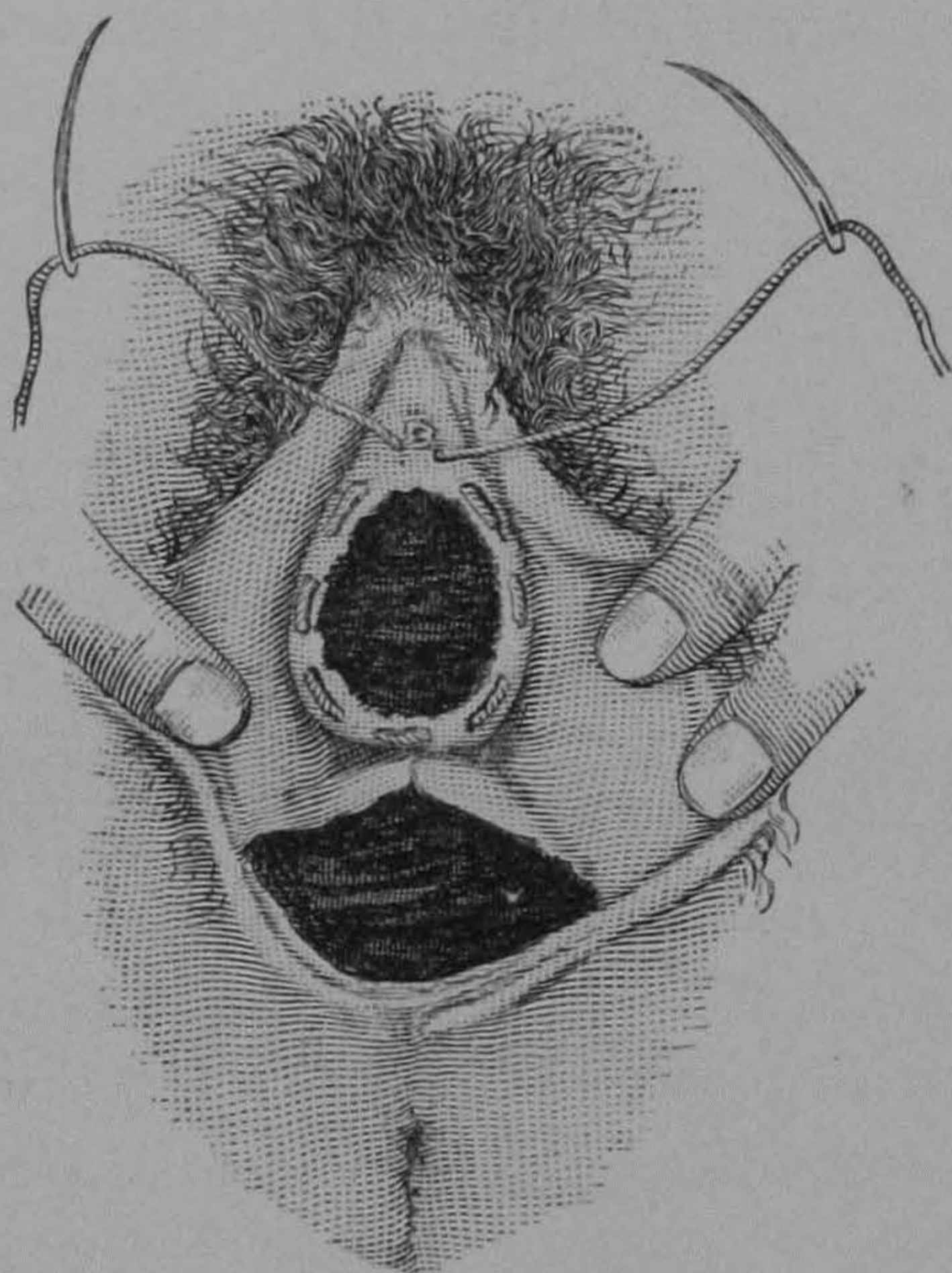


Stoltz's Operation for Cystocele and Hegar's Operation for Rectocele.

levator ani and fascia is very apparent upon parting the labia in old
cases, and these lines constitute the two depressed lateral angles.
These two angles are near together at the vulval orifice, but diverge
as they enter the vagina, until at the upper third they are not appa-
rent at all. Between them is an elevation of greater or lesser promi-
nence, which pouts out into the vulval orifice upon straining. This
is the hernia of the rectum covered by the posterior vaginal wall.
There are two parts of Hegar's operation—that which narrows the
vagina, and that which approximates the muscular fibres and fascia.
The former is entirely intra-vaginal, the latter partly vaginal and
partly perineal. The sutures for the former are all intra-vaginal;
those for the latter are vaginal and perineal.

At a point corresponding to the former fourchette, and above the level of the "angles," the mucous membrane of the vulva is caught by forceps and nicked with scissors. The same is done on the opposite side. High up on the posterior vaginal wall, above the rectocele curve, a similar mark is made. The latter is joined to the two former by a light linear touch of the scalpel. The vulva margin is caught in forceps, and from its lower circumference a strip of tissue is removed to a point on the opposite side at a level with the first. This maneuvre is repeated until the denudation is complete, each successive strip being shorter than the preceding. Denudation completed, all bleeding from arterial branches must be checked by ligature with very fine catgut. Unchecked hemorrhage will produce hematomata and interfere with union.

When the tear has extended through the sphincter the procedure is identically the same; only the denudation should extend downward, so as to uncover the edges of the sphincter. When the recto-vaginal wall is torn, again the denudation is made in a triangular form, the tear in the rectum running through the centre of the denudation. In such cases the apex of the denudation must be at least half an inch above the upper margin of the tear, even though it be next the cervix. If this amount of tissue is not taken, the perineal part may close nicely, but leave a recto-vaginal fistula.

FIG. 216.
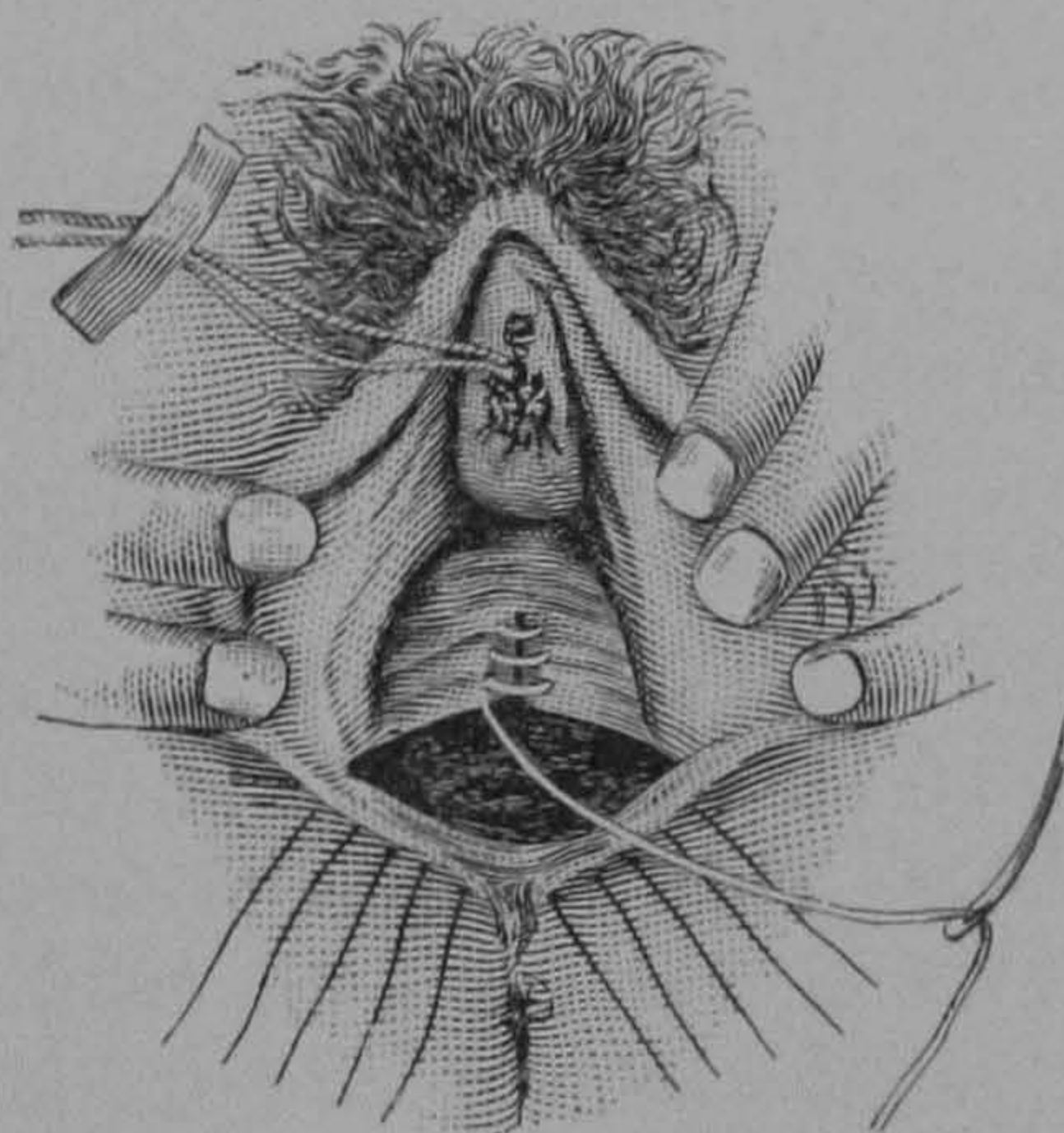


Suture Tied in Stoltz's Operation for Cystocele. Stitches in place ready for Tying in Hegar's Operation for Rectocele.

In passing the sutures a Hagedorn needle and holder are best. The first sutures passed are those in the vagina. They are of catgut, but may be of silkworm-gut or silver wire if subjected to much tension.

They are entirely buried, and are passed from side to side, one finger in the rectum guiding the needle. The continuous suture is inadvisable, but interrupted sutures should be used. When the suturing has proceded so far as to bring the last stitch passed through the middle of the rectocele—*i. e.* about three-quarters of an inch from the base of the triangle—the needle is threaded with heavy silkworm-gut. The lowest suture is passed first, the needle entirely buried. The caution is necessary not to enter the needle too far out on the skin, but it should be just at the edge. Four or five of these perineal sutures are passed, the last or uppermost one extending on the rectocele, up to the track of the last catgut suture, but not interlocking with it.

When the fibres of the sphincter ani are torn, the lower margin of the denudation should extend above a quarter of an inch on each side, below the lines of junction of the anal mucous membrane and the cicatricial tissue. In these cases there is always more or less rolling out of the sphincter ends, and these lines may be readily

FIG. 217.
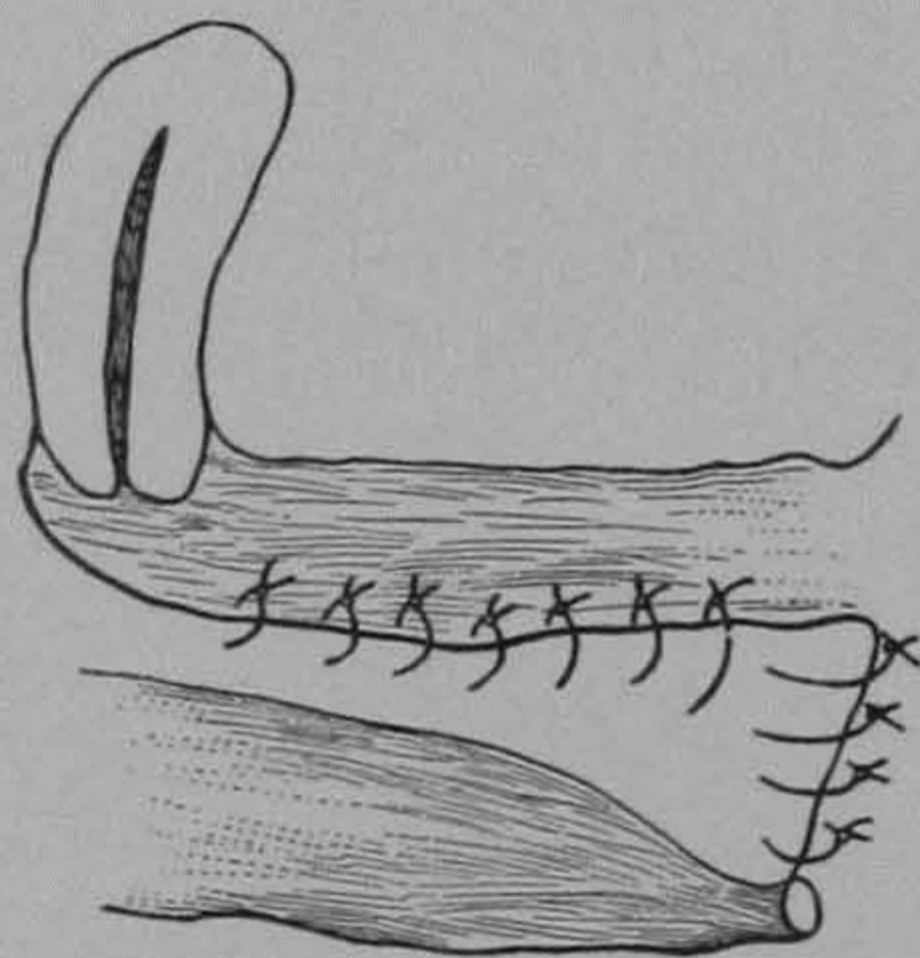


Profile View of Hegar's Operation of Perineorrhaphy.

discerned. In such cases the lower two sutures approximate the sphincter fibres.

Where the recto-vaginal septum is torn a continuous suture should be passed from the rectum, from above downward to unite the lacerated borders. This converts the complete into an incomplete laceration. When tied the knot of this suture is at the anal margin. All sutures being passed, the next step is to stretch the sphincter ani so as to paralyze it entirely. This is not done where the recto-vaginal wall or sphincter is torn. The suturing brings together fascia and muscle which perhaps for years have been separated and from disuse have atrophied. Hence such approximation is accomplished under great tension, which latter

pulls against the sphincter ani, tending to separate its fibres. This muscle involuntarily contracts against the attempt, and produces a great deal of pain. In addition to this indication, stretching allows of the more free escape of intestinal gas. After the sutures are tied a stout drain of iodoform gauze is introduced into the vagina and projects from the vulva. The catgut sutures are tied in three knots, the silkworm-gut in two. Both should be cut to leave ends half an inch long. Iodoform is dusted on the perineum, and gauze placed over the sutures and held in place by borated cotton and a T-bandage. The vaginal gauze is removed at the end of forty-eight hours, and a vaginal douche of saturated solution of boracic acid given. Another drain is not introduced unless there be special indications for it, such as bleeding or sepsis. Twice a day the nurse should irrigate the perineal sutures with bichloride solution, 1 : 4000.

The patient should be given vegetable cathartic pills the second night, so as to operate on the third day. When she has the stool it may be softened by small enemata of saline solution. After this first stool others should be had every second day. The sutures are removed about the tenth day. If there be much tension, they may cut into the flesh. Alternate ones may be removed then on the seventh day. Scrupulous cleanliness is imperatively necessary throughout the whole after-treatment. The diet should consist largely of soups, vegetables, and fruits. Opium is not needed. There is no necessity for confining the legs after the patient has recovered her senses from the narcosis, and she may be allowed to lie on her side. Confinement to bed for at least two weeks is necessary, and longer if the operation be part of the procedure to correct prolapse.

When the recto-vaginal wall has been torn and repaired, the after-treatment is somewhat different. As little disturbance as possible of the pelvic floor is here demanded. Therefore these patients should have received a most careful preparation as regards emptying the entire intestinal tract before the operation. After the operation they should receive liquid food only for three days, with cooked fruits. The bowels may gently be assisted by enema if they tend to move, but if not laxative pills may be given on the third night. In these cases, if the bowels are too fluid, particles are apt to leak into the wound, and if too hard, the stool may separate the united edges of the rectum. Rectal tubes, whether covered by

gauze or not, are of no use, but rather harmful where there has been complete laceration.

*Flap-splitting Perineorrhaphy.*—The objections to this operation are twofold: It in no way narrows the vagina, and it only partially approximates the levator ani fibres. Its field of usefulness is very limited indeed. Practically, it is applicable to those cases in which only the superficial and most exterior fibres of the perineum are torn. That by means of it the separated sphincter fibres can be united is undoubtedly true. But where a tear is so extensive as to produce rectocele prolapsus the levator ani also is entirely separated. To unite the sphincter by flap-splitting is but part of the work indicated. In no way possible can this operation narrow the vagina, abolish a rectocele, or bring together the separated fibres of the pelvic fascia. It should be performed only in the case of a patulous

FIG. 218.
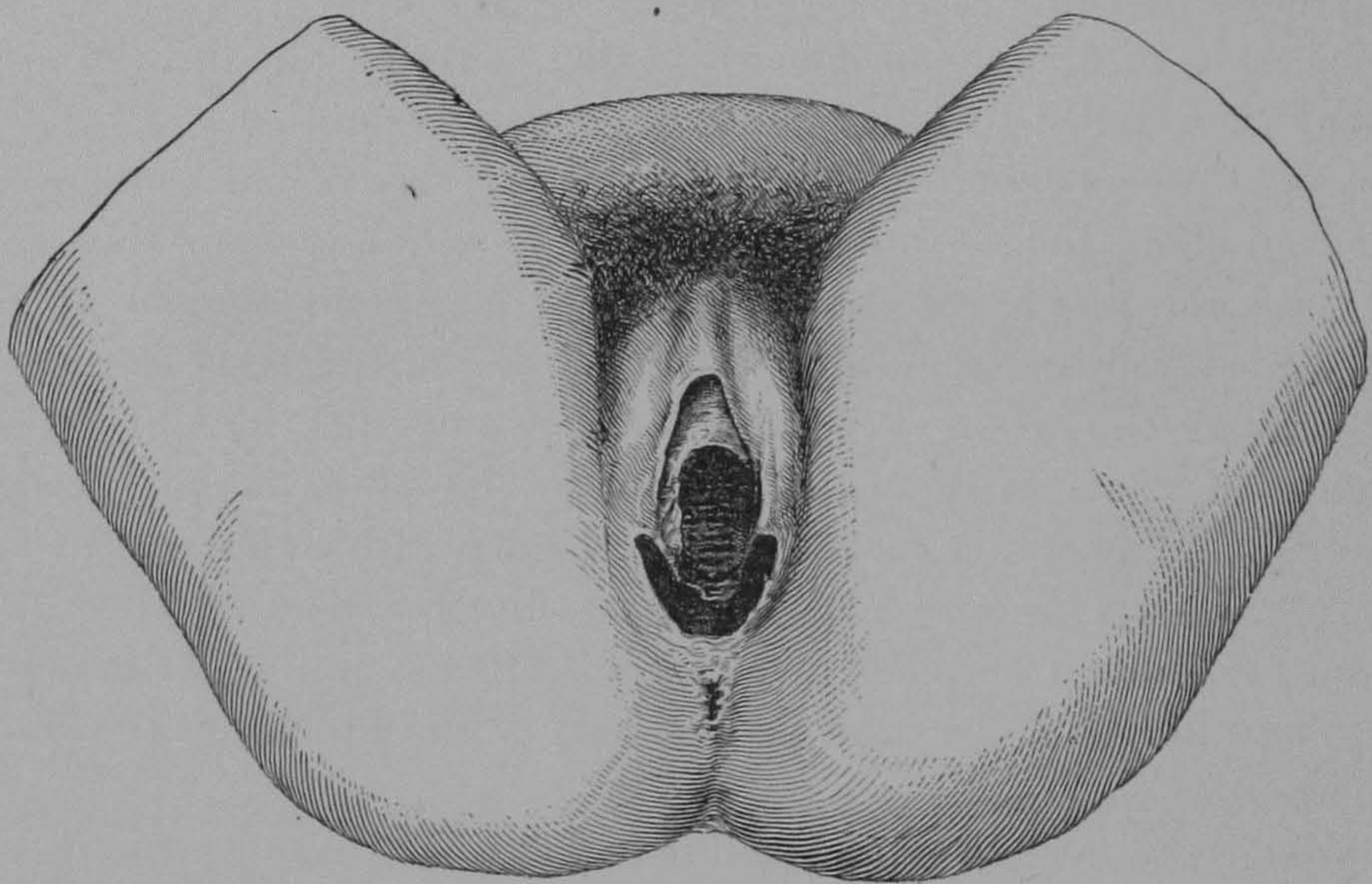


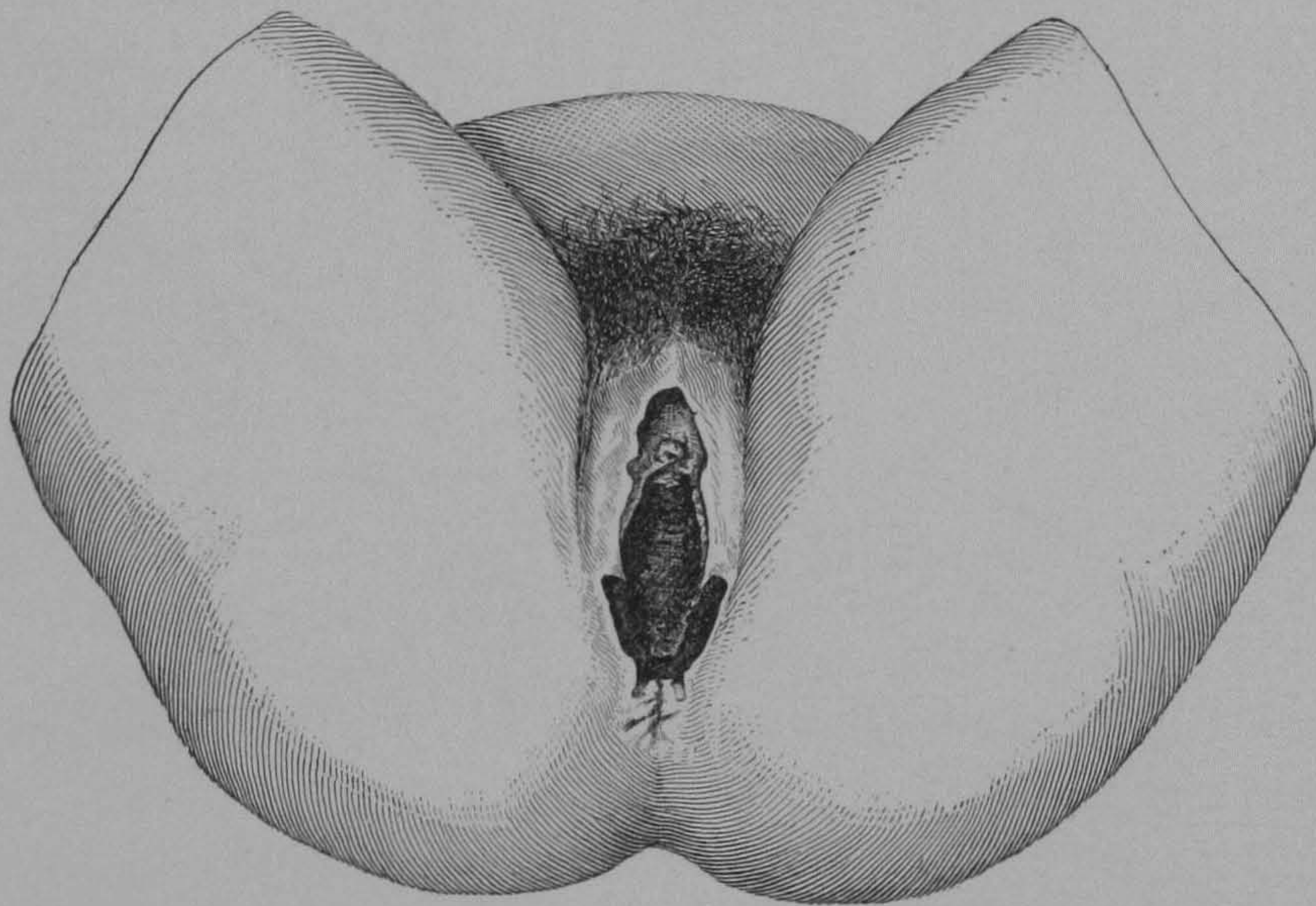Flap-splitting for Incomplete Laceration of the Perineum; Relaxation of the Vaginal Outlet.

vulval orifice without rectocele, in the case of either complete or incomplete laceration of the perineum.

The operation is performed with the patient in the dorsal position. The instruments required are a sharp-pointed pair of scissors bent on the flat, a handled perineum needle, and a tenaculum. Occasionally a pair of hemostatic forceps will be necessary to temporarily control bleeding.

FOR INCOMPLETE LACERATION.—The index finger of the left hand

being introduced into the rectum as a guide, the point of one of the blades of the scissors is thrust into the recto-vaginal septum, midway between the vaginal opening and the anus, to the depth of half an inch or more, care being taken that the instrument enters neither the vagina nor rectum. From this point the incision is made, first to one side and then to the other. The line of the incision is carried on each side outward and upward along the boundary-line between the vaginal mucous membrane and the skin of the labium. It is extended up the labium to that point at which it is desired the new vaginal floor shall exist; this point is usually that at which the lower caruncle (remnant of the hymen) exists, which point, in addition, can be located by the existent scar-tissue. The depth of the incisions tapers gradually until they reach the highest point

Fig. 219.



Flap-splitting for Complete Laceration of the Perineum; Laceration through the Sphincter Ani Muscle.

on the labia. When completed the incisions form the elliptical figure U.

FOR COMPLETE LACERATION.—Where the sphincter ani muscle is involved in the laceration the method of repair is precisely similar, with the addition of two small slits. They are made by cutting down each side of the anus to the ends of the retracted sphincter muscle, beginning the cuts at the curve of the original incision. Their length and depth are variable, depending upon the position of the retracted ends of the sphincter muscle, which must be exposed,

so that when they are brought together the two ends may unite. When completed the incisions present the appearance as shown in Fig. 219.

With the sides of the wound well separated the sutures are passed transversely.   Beginning at the middle of the opening, the handled needle is made to pierce the skin about one-eighth of an inch from its cut edge, is carried three-quarters of the way to the bottom of

FIG. 220.
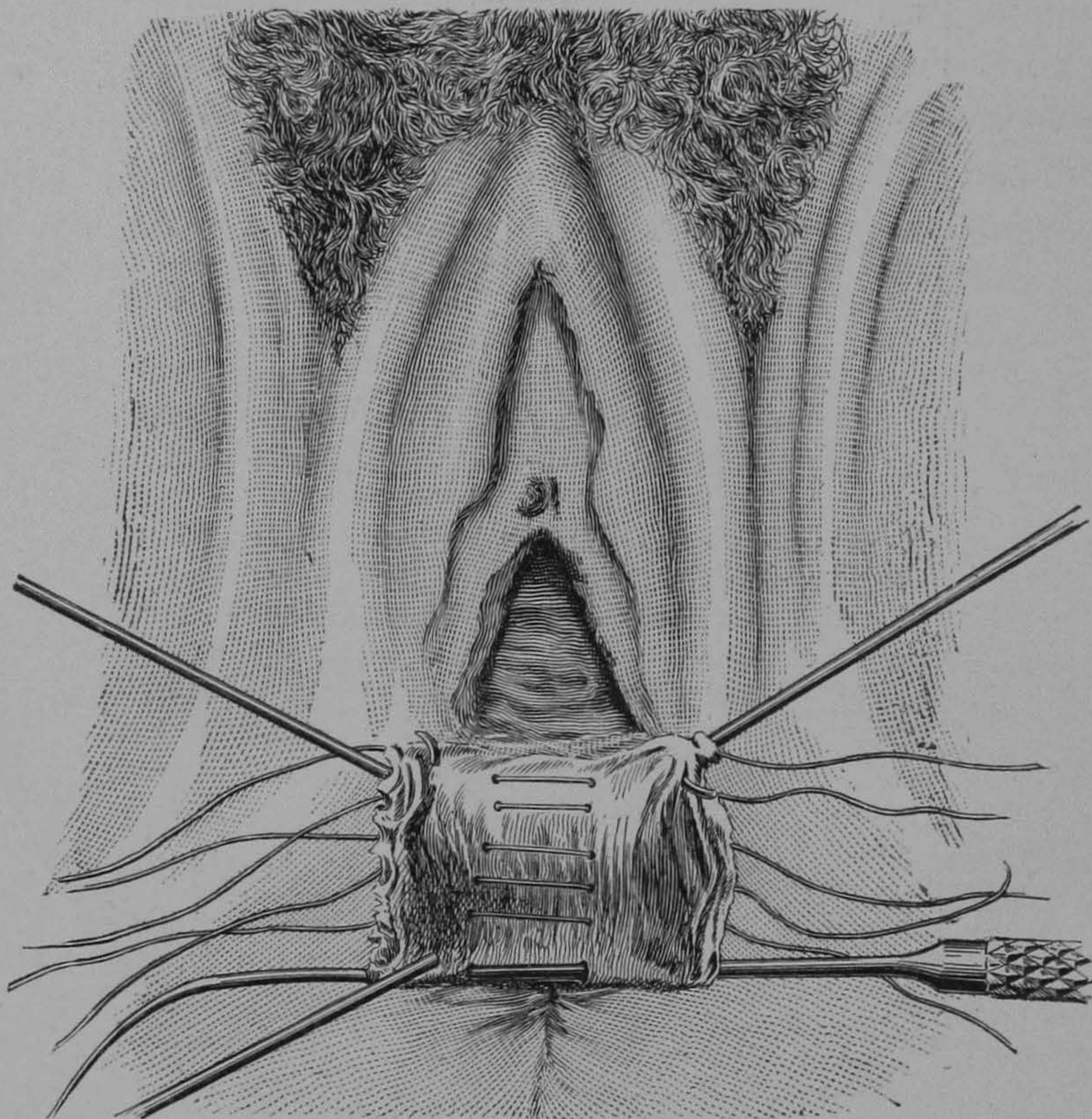


Introduction of Sutures in Flap-splitting Operation.

the wound, where it is made to emerge, and, being reintroduced at a point directly opposite the point of emergence, is carried under the tissues of the opposite side until it appears on the skin surface at a point directly opposite that at which it was first introduced.   The eye of the needle is now threaded with a silkworm-gut suture and the needle withdrawn, dragging with it the end of the suture.   Several similar sutures are passed above and below this median one. The topmost suture must pass through the vaginal flap as it is held up by a tenaculum ; the lower suture, if the laceration be a complete one, must include both ends of the retracted sphincter muscle.   The

corresponding ends of the suture being now tied, or, better, shotted, the pelvic floor is lifted up toward the pubis by the crowding in below of the gluteal tissues. The result forms a fair support to the vaginal outlet, but in no way has any influence on any injury done to the vaginal floor.
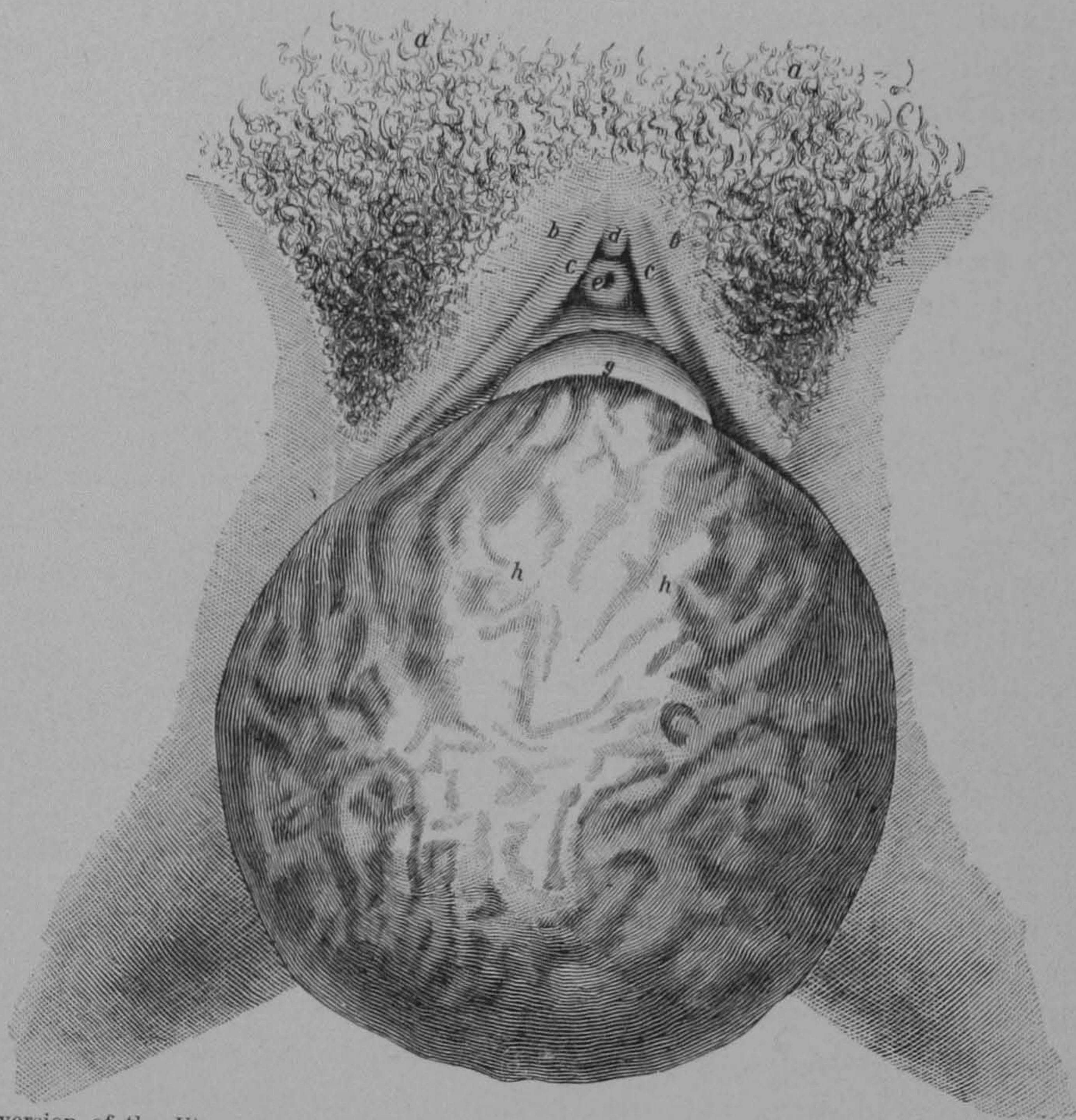
## INVERSION OF THE UTERUS.

This fortunately rare complaint is most often a complication of labor, and at times is fatal. But cases often live, and, as the condition results also from neoplasms, such as fibroids, they come to gynecologists as cases of chronic inversion. As such they will be described.

That inversion may occur in the virgin uterus is undoubtedly true, but the vast majority of cases result from childbearing. It is necessary that the cervix be large and patulous, the fundus heavy and soft to enable the uterus to turn inside out, for such is, in reality, the condition in inversion. Continuous severe hemorrhage marks most cases. The patients are anemic, suffer great pain and bearing-down in the uterus, and frequently there is a profuse leucorrheal discharge, often purulent. They are very generally incapacitated for their work, and as time progresses they become more and more disabled by exhaustion. Examination shows a tumor symmetrical, firm, and of reddish color, filling the whole or part of the vagina as the inversion is partial or complete. Occasionally a fibroid polyp of greater or lesser size is attached to the inverted fundus, and this has probably been the exciting cause of the displacement. At first, in the early stages, the cervix is open and is occupied by a loop of intestine, but later it becomes contracted and merely contains the Fallopian tubes. The condition may also be associated with prolapsus, in which case the tumor may protrude from the vagina, under which circumstances it is not infrequently mistaken for prolapsus uteri. Generally the tumor is retained in the vagina. Inversion having taken place, the cervix contracts, and strangulation and gangrene of the uterus may result. Cases have been reported of spontaneous cure by the fundus sloughing away in consequence of the constriction to its circulation caused by the cervix squeezing it tightly; also by the organ returning to its normal condition. Atlee reports an interesting case of this kind, where the inverted uterus was reduced by persistent and long-continued efforts at coition on the part of the husband after all other treatment had

failed. The woman became pregnant and was delivered of a healthy child. The uterus had been inverted for years. Cases progress to a fatal issue from shock, due to hemorrhage, and progressive asthenia, sepsis, or peritonitis. The usual cause of death in the chronic cases is exhaustion from the continuous loss of blood.

The DIAGNOSIS must be made by examination, and is occasion-

FIG. 221.

Inversion of the Uterus: *a*, mons veneris; *b*, the larger labia; *c, c,* nymphæ; *d*, clitoris; *e*, meatus urinarius; *g*, anterior border of the external os of the uterus; *h, h,* the internal surface of the uterus turned outside.

ally very difficult, although usually the condition is readily determined by a vaginal exploration. The soft, uniformly-enlarged mass is felt filling the vagina, the upper end or pedicle of which is constricted by a ring of tissue, through which it is very evident that the mass protrudes. If that condition be made out satisfactorily, the true lesion can hardly be overlooked. Should there

be any uncertainty as to the diagnosis, the bladder and rectum should be emptied. Examination combined by means of a sound in the bladder and a finger in the rectum will demonstrate the absence of the body of the uterus from its normal position, and the dimple of the inverted cervix will be felt from above. The tumor itself is firm, smooth, and the surface bleeds easily. The invariable diagnostic signs are the opening of the cervix above, which can be reached by the rectum, even though it may not be felt through the abdominal wall, and the very small openings of the tubes, at the sides of the base of this tumor, together with the

Fig. 222.
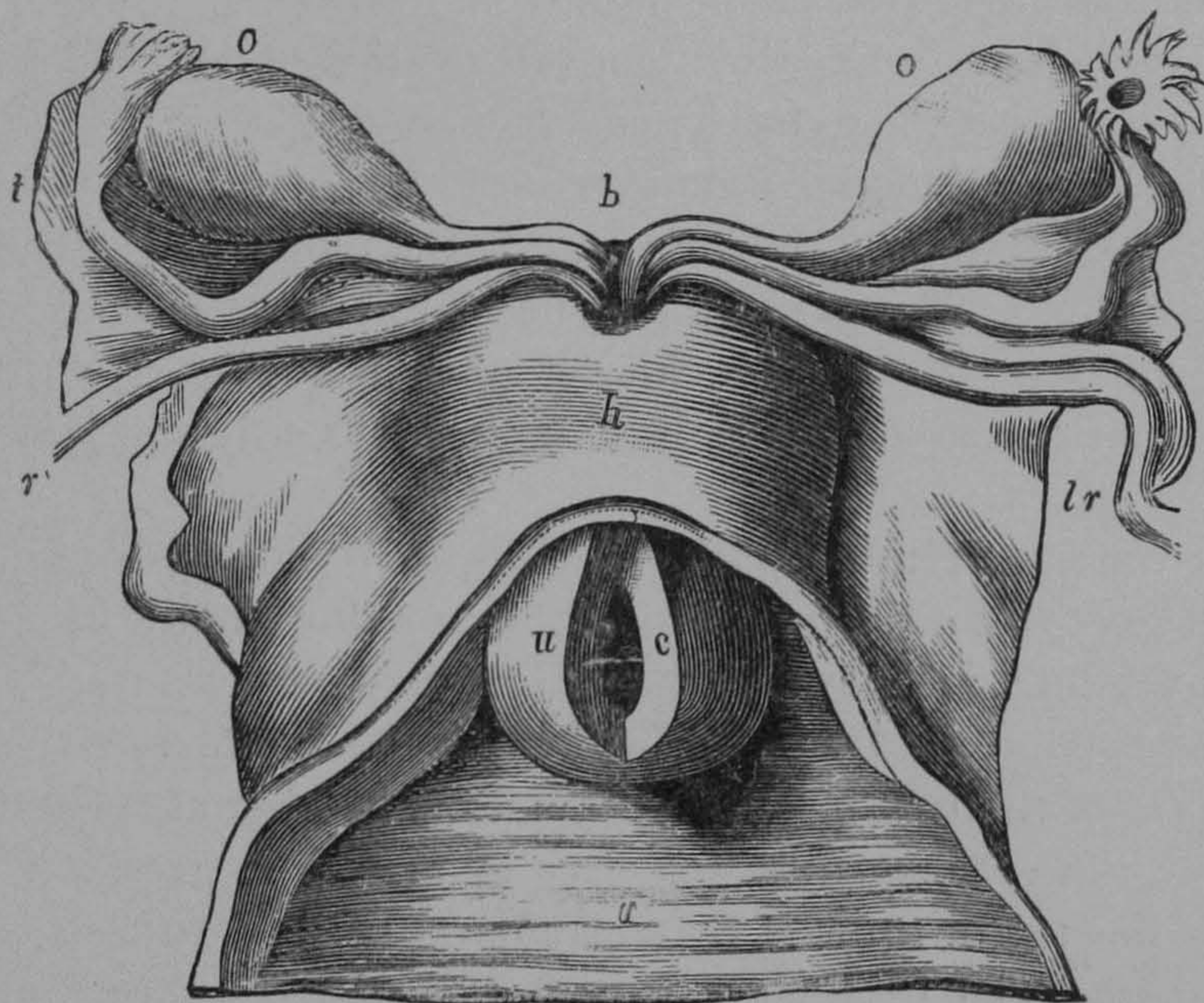


Complete Inversion: *v*, vagina; *u c*, incised uterus, showing the cavity; *b*, border of the inverted portion; the round ligaments, the Fallopian tubes, and the ovarian ligaments are drawn in; *l r*, round ligaments; *t*, Fallopian tubes; *o, o*, ovaries; *h*, cervix covered by peritoneum.

constricting band of cervix, beyond which the finger cannot pass at any point about the pedicle of the tumor as felt in the vagina.

The PROGNOSIS is unfavorable, on account of the constant loss of blood, it being only a question of time as to how long the patient can stand the drain.

TREATMENT.—Chronic inversion is exceedingly difficult to cure. Gentle, continuous taxis, at the same time using some force, is the preferable method first to be tried. It is made as follows: The hand in the vagina grasps the fundus and exercises firm pressure upon it. The hand above, on the abdomen, attempts to distend the

cervix and make counter-pressure, while the fundus is squeezed and pushed up. Many failures should not discourage the surgeon, but the pressure should be gradual and steady, care being taken not to use undue force, as must be the case in all efforts to overcome the contraction of unstriped muscular fibre. Peritonitis and death have been known to result from rough and too prolonged efforts in this direction. If the cervix yields, it yields rather suddenly. The attachments of the vagina to the cervix are of aid to the manipulations, and the tumor can be so pushed up as to render the vagina tense during the maneuvre. The operation is best performed with the woman under the influence of an anesthetic. Repeated failures after conscientious effort compel us to consider continuous elastic pressure, removal of the organ, or, possibly, attempt at replacement by Thomas's method.

Taxis having failed, continuous elastic pressure must be tried. The bladder and bowels being empty, the uterus is pushed up if prolapsed, and a Braun's colpeurynter, previously soaked in a saturated solution of boracic acid for several hours, is introduced. This is then injected with tepid water until it fills the pelvis very snugly.

The contents of the colpeurynter are to be gradually increased. It should not be left in too long, but once a day should be removed for a few hours, the parts and the colpeurynter cleansed, and the latter reintroduced. Few cases will resist this method of treatment. The object of the treatment is to exercise a continuous pressure, not sufficient, however, to obstruct circulation to too great an extent. During the treatment the patient should be kept in bed; indeed, the pain produced by the colpeurynter is pretty severe, and would of itself confine the woman to bed. Morphia for its relief is indicated, but should not be pushed too far.

The only caution to be made is that the physician should not become too easily discouraged in his attempts to replace by taxis and the colpeurynter.

It is now twenty-three years since Thomas advocated opening the abdomen and dilating the cervix, and in that time the mortality from celiotomy has fallen to a very small percentage; therefore when taxis and the colpeurynter have been given repeated tests and have failed, Thomas's operation may be tried, although without much prospect of success. If replacement cannot be made by Thomas's method

very promptly, at the same sitting the organ can be removed by abdominal hysterectomy in a few minutes.

*Thomas's Operation for Inversion.*—Thomas succeeded with one case, and lost his second from infection—something which now may be prevented. Other successful cases have been reported. A consideration of the technique of the operation and the changes in the uterus gives promise that the mortality can be kept below 10 per cent., but the proportion of successes is very slight.

The patient is prepared for both a vaginal operation and a celiotomy. The special instrument required is Thomas's dilator. It might be modified usefully by making the flanges wider, so that at the act of dilating pressure upward may be made, thus contributing to the rolling out of the inversion. The dilating portion need not be so long. A short abdominal incision only is necessary, merely sufficient to ascertain the condition of the intraperitoneal tissues. The abdomen being open, the operator's left hand is introduced into the vagina and the mass pushed up to the incision. The dilator is introduced and the upper part of the constriction dilated at the same time. This is an important observation by Thomas—

FIG. 223.
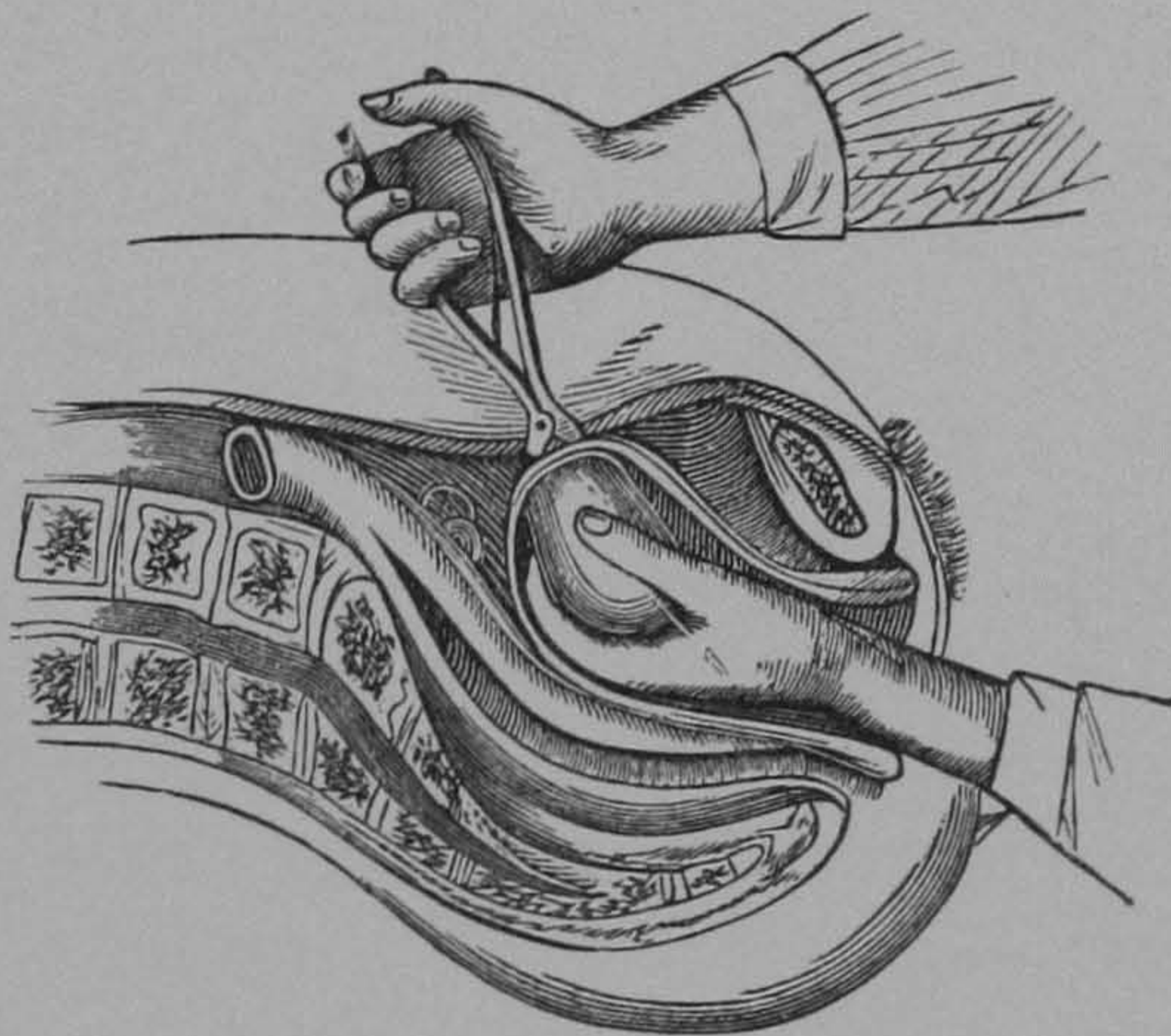


Thomas's Operation for Replacement of the Inverted Uterus.

that the reduction takes place in a manner exactly the reverse of that in which the inversion occurred. In this way each fraction of the constriction is successively dilated, and the inversion is reduced in stages beginning with the cervix. The caution is necessary to so apply the instrument as not to wound the tubes. Because of the

possibility of this it might be better to try the fingers arranged into a cone before using the dilator.

*Vaginal amputation of the corpus uteri* is at no time justifiable. If conservative methods fail to reduce the deformity, the uterus must be removed in toto. Should the abdomen be opened for a trial with Thomas's operation, and that fails, as has usually been the case, removal of the wound through the abdominal opening is the proper procedure. Should it be decided from the first not to try the Thomas method, but to remove the displaced organ, vaginal hysterectomy is the proper procedure to be adopted.

To recapitulate, gentle but well-directed efforts at taxis are to be first tried, with the patient under an anesthetic. Should this not accomplish the object at a single sitting of an hour, or show very decided signs of ultimate success, continuous elastic pressure by means of the colpeurynter or Aveling's repositor is to be tried. Should this give no promise of success after several days' trial, vaginal hysterectomy is the most rational procedure.

Malignant growths characteristics:

Progressiveness
Rapid growth
Return after removal
metastasis
Cachexia.
Debility
Anæmia
Hæmorrhage
Pain
Discharge
Odor.