

and each should pass from the vaginal surface under the whole denuded area and through the edge of the mucosa which has been left to form the new canal. Usually from three to five sutures on each side are sufficient. Sometimes, on account of the large amount of scar which has to be removed, it will be found necessary to cut away one strip of the mucous membrane which was left to form the new canal. This can be done without fear of atresia. It is generally better in operations upon the cervix not to pack the uterine cavity, as the removal of the gauze may tear out the sutures. Stellate and atypical lacerations must be repaired in a manner suited to each case. Where small tabs exist, they are often advantageously removed, especially if the cervix is enlarged, and the two adjoining edges denuded and sutured.

George Haven.
Ernest Boyen Young.

UTERUS, DISEASES OF: CONGENITAL MALFORMATIONS. — DEVELOPMENT. — The

uterus is formed by the approximation and fusion of the middle portions of the Müllerian ducts. The upper portions remain distinct, constituting the Fallopian tubes, while the lower unite and form the vagina. A vertical partition separates at first those parts of the ducts of Müller which go to make up the uterus and vagina, but this subsequently disappears, and the two canals become one. At a later period in the course of development, at the lower end of the middle third of the tube thus formed, the cervix appears, dividing the genital canal into uterus and vagina. The tissues at the summit of the middle third and between the points of origin of the Fallopian tubes likewise thicken, and the fundus uteri comes into existence. The insertion of the round ligament separates the upper from the middle third.

It is interesting to note that in the lower animals development regularly stops short at various points in the scale of progression, which ultimately ends in the formation of that which in the human female is a perfected genital canal, so that what in the latter are termed abnormalities, in the lower animals are the normal characteristics. At birth the cervix is longer and thicker than the uterine body, and this state of affairs persists throughout childhood. At puberty rapid growth occurs, and this condition is reversed, the cervix then appearing as an appendage to the body. By the twentieth year the genitalia have reached their full measure of development.

GENERAL ETIOLOGY.—Congenital malformations of the uterus are owing to a non-appearance of the elements

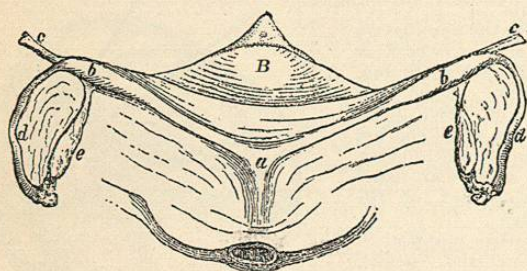


FIG. 4883.—Rudimentary Uterus, Posterior View. (After Veit.) a, fused but solid portion of the uterus; b, b, uterine horns; c, c, round ligaments; d, d, tubes; e, e, ovaries; B, bladder.

which go to make up this body, to an arrest in their development, or to their complete destruction by nutritive disturbances, pressure changes, etc.

CLASSIFICATION AND NOMENCLATURE OF VARIETIES.—The whole subject of congenital malformations of the sexual passages has been thrown into much confusion by the varying methods of arrangement and classification

adopted by different authors, and still more so by the complicated and pedantic terminology that has been employed. The same name has been given to different conditions, and the same condition has received different

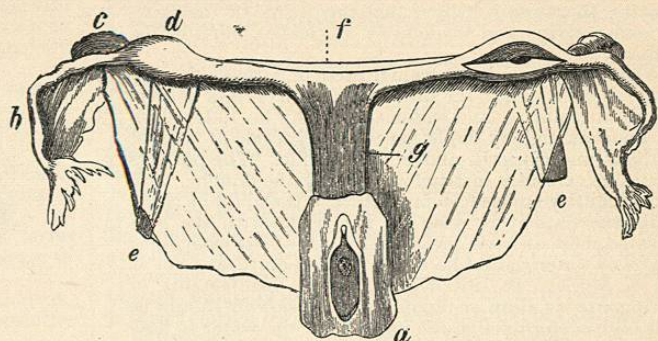


FIG. 4884.—Uterus Rudimentarius Bipartitus or Bicornis. (After Rokitsky.) a, Vagina; b, tubes; c, ovaries; d, enlargement of the horn; e, round ligaments; f, point of union of the two horns; g, cellular tissue traversed by muscle fibres which simulate the uterus in form.

designations. The classification and nomenclature which follows is that of Müller; it is at once the simplest and the most comprehensive.

I. COMPLETE ABSENCE OF THE UTERUS: DEFECTUS UTERI.—Anatomy.—Complete absence of the uterus, a

condition rarely met with in viable subjects, is by no means uncommon in monstrosities incapable of life. Whenever encountered, other evidences of a serious blow to the progress of development are almost always present in some portion of the genital apparatus. The individual, in voice, habit, and general conformation adheres to the female type, but the organs which characterize the woman may, alone or in combination, be entirely wanting, or else may exhibit all grades of rudimentary development. Thus, with absence of the uterus it may be impossible to discover any trace of ovaries, tubes, vagina, or mammary glands; yet these structures may be present, though in a sufficiently undeveloped condition to render the proper performance of the functions severally peculiar to them a matter of doubt or of impracticability. Still, though this is true only of those in whom life is possible, the remaining organs characteristic of the female may be nearly perfect in their construction, and some, though rarely all, may correspond entirely with the normal type. The external genitals have been observed to be either normal or poorly developed, and in adults occasional absence of the pubic hair has been noted.

Etiology.—Defectus uteri is dependent either upon an entire absence or upon a complete destruction of the median portions of Müller's ducts.

Diagnosis.—The recognition of the abnormality under discussion is surrounded with the utmost difficulty, and it is never warrantable to assume positively in a given case, even after negative results have been obtained from careful abdomino-rectal palpation, assisted by a sound in the bladder, that no traces of a uterus exist; for even upon the post-mortem table errors have arisen, and the rudiments of a bilobed uterus have been mistaken for the Fallopian tubes, or a hollow rudimentary uterus for the vagina.

Treatment.—No treatment will, of course, be of any avail.

II. RUDIMENTARY UTERUS: UTERUS RUDIMENTARIUS.—Anatomy.—Between defectus uteri and uterus rudimentarius there is often no very great hiatus in the scale of development, for the more decided forms of the latter malformation may be almost indistinguishable from complete absence of the womb. Thus the presence of a slight indefinable thickening on the posterior surface of the bladder, or at the junction of the imperfectly developed broad ligaments, or again, of a solid, fibrous

mass, the size of a hazelnut, located at the point normally occupied by the womb, may be all that there is to indicate an attempt at uterine formation.

If development has proceeded a step farther, a solid, narrow, flat, laterally extended band composed of muscular tissue, with the tubes ascending and the round ligaments descending from it, may be encountered; or a fibrous mass without a neck, and solid, but still having the general conformation of the uterine body, has been observed, from the upper angles of which the round ligaments originate and extend downward into the inguinal canal.

In the uterus bipartitus, which exemplifies the next stage in progression toward the typical organ, two separate, round, solid, vertically placed bodies, composed of muscular and connective tissue, lie between the bladder and the rectum. Occasionally these two bodies unite toward their lower extremities, forming a mass not unlike the cervix in shape, which is in immediate relation below with a rudimentary vagina, while above they still remain independent, like two diverging horns, and are usually solid, but may present a slight hollow enlargement lined by mucous membrane at or near the point of origin of the round ligaments. To this latter abnormality the name uterus rudimentarius bicornis has been given, although some prefer the term uterus rudimentarius bipartitus.

With uterus rudimentarius, which is not confined to monstrosities, but occurs also in viable subjects, the external genitals, vagina, tubes, ovaries, and mammae may exhibit the same variations in structure which have been alluded to in speaking of defectus uteri.

Etiology.—The cause which produces the rudimentary conditions just described operates during the very earliest stages of fetal development, and as the exact time of its appearance and the degree of its activity vary, so a variation in results, though always within certain limits, will be observed.

In defectus uteri the elements from which the uterine body is to be formed are wanting or have been obliterated, but in the present instance they have appeared, but have been more or less destroyed, at divers periods of their development, by nutritive disturbances of differing intensities. It should not be forgotten, however, that there may be growth of even the lowest rudimentary forms.

Physiology and Symptoms.—Although in absence of the uterus and in atrophy of the organ the general conformation peculiar to the female and her desire for the opposite sex are preserved, yet there is such an imperfect development of other organs that the functions characteristic of woman do not come into play at all. The condition of the ovaries will determine the existence of ovulation. Menstrual molimina may, but menstruation cannot, occur, and vicarious hemorrhages are rare. Sexual intercourse is possible when the vagina is not too seriously involved, and even then the urethra may be utilized for this purpose. Conception is, of course, impossible.

Diagnosis.—It is not difficult to confound absence of the uterus with atrophy of the organ, when development has been arrested at a very early stage. Even on the most careful examination mistakes have been made by the most skillful among diagnosticians. In any doubtful case, to determine the presence or exact condition of the womb, the patient should be thoroughly anesthetized, and the bladder and rectum should be empty. A sound or a silver catheter is introduced into the bladder, the finger of one hand is passed into the rectum, and the other hand is placed upon the abdomen; the entire length of the catheter or sound can now be felt between the hands if no uterus, or only an extremely rudimentary one, is present. Any solid mass lying in the median line between the rectum and the bladder is probably a rudimentary uterus. The tubes usually occupy a somewhat lateral position, but may be mistaken for uterine cornua. The ovaries, by their sharply defined boundaries, size, shape, mobility, and situation can be more or less easily recognized.

The more advanced forms of atrophic uterus are not difficult to map out, and, in any event, examination is often facilitated by palpation through the posterior bladder wall, if the urethra has been dilated by previous attempts at cohabitation.

Treatment.—If menstrual molimina occasion severe suffering, castration is a justifiable procedure. The rudimentary uterus has also been extirpated.

III. ABSENCE OR ATROPHY OF THE CERVIX UTERI: DEFECTUS CERVICIS UTERI ET CERVIX UTERI RUDIMENTARIA.—Anatomy.—Numerous grades of this deformity may be encountered. The entire cervix is absent, or a solid fibrous mass or band replaces the normal structure.

When its formation is more perfect the internal os is alone closed, or the external os may be thus affected, or both may be occluded, while the cervical canal between is partially or entirely patent. Atresia of the external os only, marks the slightest degree of this maldevelopment. The uterus above may be perfect in structure or rudimentary. The vagina is normally developed, though occasionally the upper part of the canal may participate in the cervical atresia.

Since obstruction is the essential accompaniment of absence or atrophy of the cervix, hæmatometra is the natural pathological sequence when menstruation occurs.

Etiology.—In the more pronounced types of the deformity under discussion, and especially if other portions of the genital canal participate in the existing maldevelopment, it is probable that there has been at best only an abortive attempt at cervical formation. But when the uterus, vagina, etc., are normal in structure and the cervix presents no very aggravated form of atresia, we must regard as the important etiological factor some

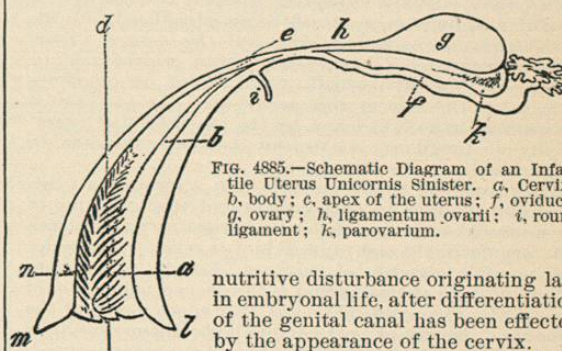


FIG. 4885.—Schematic Diagram of an Infantile Uterus Unicornis Sinister. a, Cervix; b, body; c, apex of the uterus; f, oviduct; g, ovary; h, ligamentum ovarii; i, round ligament; k, parovarium.

nutritive disturbance originating late in embryonal life, after differentiation of the genital canal has been effected by the appearance of the cervix.

Physiology and Symptoms.—If the ovaries and uterus are not arrested in development, menstruation will occur when puberty has been reached and hæmatometra appears, accompanied at first with menstrual molimina, and later by almost continuous pain, by pressure symptoms, and by threatened rupture of the Fallopian tubes. If the uterus and ovaries are rudimentary, there will be no menstruation, and therefore no blood stasis. Sterility is an invariable accompaniment of any form of cervical atresia.

Diagnosis.—Careful combined manipulation, performed as described in speaking of atrophy of the uterus, will reveal an absence or marked rudimentary condition of the cervix, while the failure to pass a sound or probe, or to find an opening in a neck apparently of normal structure, will at once denote the existence of one of the less marked forms of cervical atresia.

If hæmatometra exists, fluctuation can be detected through the rectum, and perhaps through the obstructing membrane, if it be not excessively thick and resistant, as is likely to be the case when the upper part of the vagina is involved in the atresia.

IV. THE ONE-HORNED UTERUS: UTERUS UNICORNIS; UTERUS UNICORNIS SINE ULLO RUDIMENTO CORNU ALTERIUS.—Anatomy.—When the uterus is one-horned the cervical is larger than the corporeal portion, and the latter consists of a long, tapering, arched, or bow-shaped

cone, situated laterally or lying obliquely in the pelvis, from the apex of which spring a Fallopian tube, a round ligament, and an ovarian ligament supporting an ovary.

In the purest form of this anomaly no trace of the other horn, or of the tube, round ligament, ovarian ligament, ovary, or broad ligament of the corresponding side is to be found.

Occasionally the one-horned uterus is solid.

Although uterus unicornis may be the only rudimentary condition discoverable in a given case, yet the vagina is often narrow, and in the more pronounced types of this anomaly one-half of the whole genito-urinary apparatus is occasionally found to have suffered in its development.

Etiology.—In uterus unicornis without a rudimentary second horn, it is probable that only one Müllerian duct has ever been formed.

Physiology and Symptoms.—Although the one-horned uterus differs in shape, size, and position from the normal uterus, yet when hollow it possesses such anatomical essentials as enable it to perform all the functions which pertain to that organ. Menstruation, conception, and pregnancy occur without hindrance, and even twins have been delivered from a one-horned womb. On account of somewhat deficient muscular development, it might be surmised that rupture of the uterus would be readily induced during the throes of labor. Such is not usually the case, although, if the muscular structure of the organ be weakened and displaced by the growth of placental vessels, such an accident during parturition is not improbable.

The muscular hypertrophy accompanying the first pregnancy assists the uterus unicornis in the part it has to play in those occurring subsequently.

Diagnosis.—Uterus unicornis is easily recognized on careful examination, a sound being introduced into the uterus and one examining finger into the rectum. Even when impregnated its shape and oblique position may be preserved; but the normal organ is not uncommonly deflected to the side at this period, and the one-horned uterus may be so broadened by the physiological hypertrophy of pregnancy as to lead to some confusion in diagnosis.

Treatment.—It is not unlikely that appropriate treatment will produce an enlargement and strengthening of the muscular structure of the one-horned uterus, and this is a very desirable end to be achieved when we consider the possible danger of rupture during parturition. When rupture at this period is threatened, labor should be expedited by artificial means, if necessary, and at the same time the risk of post-partum hemorrhage should be held in mind and proper contraction of the organ secured.

V. THE ONE-HORNED UTERUS WITH ATROPHIED SECOND HORN: UTERUS UNICORNIS CUM CORNU RUDIMENTARIO; UTERUS UNICORNIS EXCAVATUS CUM RUDIMENTO CORNU ALTERIUS SOLIDO s. EXCAVATO.—**Anatomy.**—On the convex side of an obliquely inclined uterus unicornis

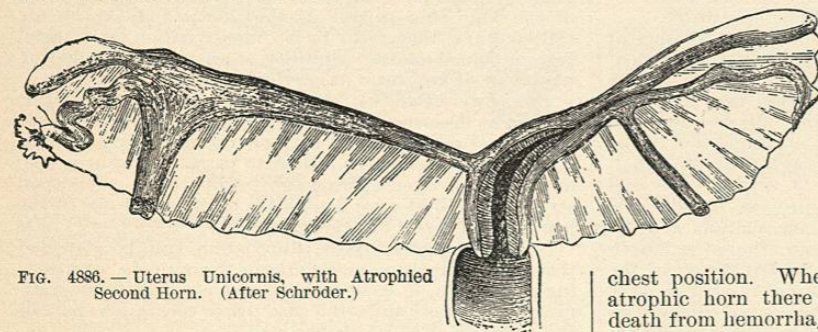


FIG. 4886.—Uterus Unicornis, with Atrophied Second Horn. (After Schröder.)

there may be found a rudimentary second horn, which exhibits in different cases various degrees of imperfect development. A solid muscular cord, or band, unconnected with the ovary above or the other horn below, is

sometimes observed, but occasionally this is expanded at the upper extremity, is hollow, and communicates with the tube alone, or with the better developed cornu below, or with both, although it may be closed at each extremity.

Etiology.—In this condition both Müllerian ducts have appeared, but one has been more affected in its development than the other by causes, of a nature already described, operating early in embryonal existence.

Physiology and Symptoms.—The functions which a rudimentary cornu attached to a one-horned uterus is capable of performing depend, of course, upon the degree of its development. If it is hollow and its inferior extremity is patent, menstruation may occur, though not so early nor in so great quantity as from the more perfect horn. But if there is no opening below, a slowly developing hæmatometra will result, and perhaps a hæmatosalpinx as well.

When pregnancy occurs, it is usually in the more typically formed cornu, and utero-gestation is quite normal, and parturition also, except when, as sometimes happens, the rudimentary horn offers a mechanical obstacle to its accomplishment.

It is quite possible, however, for the product of conception to be implanted in the rudimentary horn, especially if a communication exists between it and the vagina through the normal cornu. When there is no such communication, a like result may be accomplished by the processes known respectively as transmigratio ovuli externa and transmigratio seminis externa.

When pregnancy does take place in the atrophic horn, this enlarges up to a certain point and then ruptures, as a rule between the second and fifth months of utero-gestation, death usually ensuing, although encapsulation of the fœtus may occur and recovery take place. Still, pregnancy may go on to full term without interruption.

The normal horn participates to a certain extent in the changes incident to pregnancy, and a decidual membrane forms within its cavity.

Diagnosis.—The existence of a conical arched body, with a mass more or less like itself springing from its convex surface, will convince the examiner that he has to do with a one-horned uterus with a rudimentary second horn, although a pedunculated subperitoneal fibroid may closely resemble the atrophic cornu and be mistaken for it.

When pregnancy occurs in the poorly developed horn the symptoms will all be those of extra-uterine fetation, and as the round ligament cannot be mapped out with any certainty, it will remain a matter of doubt whether the ovum has been implanted in the Fallopian tube or in the rudimentary horn.

Treatment.—In this condition active interference is indicated only when there has been considerable blood stasis in the rudimentary horn and rupture or other dangers threaten, or when the horn offers a mechanical impediment to delivery, or is itself the seat of pregnancy. Accumulated blood may be evacuated by trocar puncture through the vaginal vault, although in some cases laparotomy and drainage, or entire removal of the sac, will be the more judicious procedure.

The rudimentary cornu, which makes labor tedious or impossible, may be elevated above the parturient canal by vaginal manipulation combined with the assumption of the Sims or knee-chest position. When pregnancy occurs in a markedly atrophic horn there is serious danger of rupture and death from hemorrhage. The condition should be treated as an ordinary ectopic gestation should be, by abdominal section and removal.

VI. THE TWO-HORNED UTERUS: UTERUS BICORNIS.—**Anatomy.**—Next above the uterus unicornis with a rudimentary subsidiary cornu, is placed, in the scale of

development, the uterus bicornis. Various degrees of this latter rudimentary condition are described. In the lowest and most imperfect forms there are two separate and distinct hollow uterine bodies, projecting laterally like horns, which unite below in a common cervix, deeply furrowed before and behind. Again, the union is

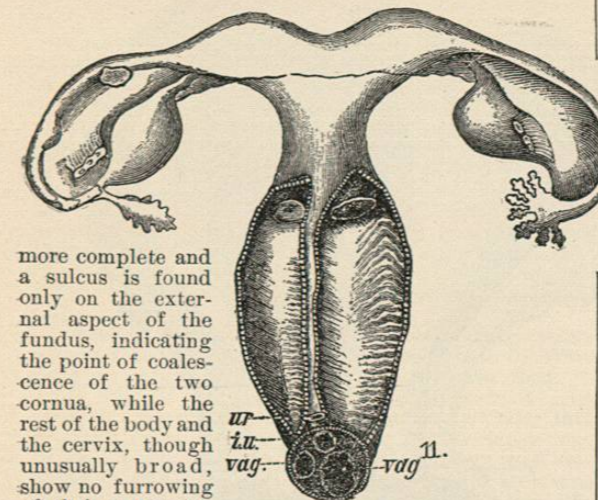


FIG. 4887.—Uterus Bicornis. (After Hunke-möller.) ur, Urethra; v, entrance to the urethra; vag and vag¹, entrances to vagina. The anterior wall of both vaginæ has been removed.

more complete and a sulcus is found only on the external aspect of the fundus, indicating the point of coalescence of the two cornua, while the rest of the body and the cervix, though unusually broad, show no furrowing of their outer surfaces. This condition has been variously termed uterus arcuatus, uterus in-trorsum arcuatus, and saddle-shaped uterus. When the fundus shows no furrow, but is flat—the next step in advance—the designations uterus triangularis, uterus incudiformis, and uterus planifundalis have been employed. In all forms of the two-horned uterus one side of the organ is apt to be larger than the other, and the left horn—that is, the normally developed organ—lies a little farther forward than the right. A partition wall more or less complete may divide the cavity of the uterus bicornis. The entire womb may be thus separated into two parts (uterus bicornis septus), or the body is divided while the horns remain distinct (uterus bicornis unicorporeus), or the body is double and the cervix single (uterus bicornis unicolis). Still, in many cases no pronounced partition is discoverable, though bands of tissue may run from the anterior to the posterior uterine wall, or a prominent ridge on the interior of the uterus may show an attempt at division. With uterus bicornis, although the vagina is often found divided, the remaining elements of the genital system are usually perfect in development. Sometimes, very curious to say, the face, thorax, and pelvis are broadened, as if to correspond with the unnatural width of the uterus. When one-half of a two-horned uterus is conspicuously behind its fellow in development, it is not unusually occluded; this is more frequent on the right than on the left side, and the atresia may be seated in the cervix or at the external os uteri.

Etiology.—When coalescence of the middle portions of the Müllerian ducts is only partial, uterus bicornis will result, and the degree of deformity will depend upon the extent of fusion. The recto-vesical ligament undoubtedly plays an important part in the genesis of this rudimentary condition. This ligament, as its name implies, stretches from the anterior surface of the rectum to the posterior surface of the bladder, and lies in the furrow on the fundus uteri. Its origin is somewhat doubtful. Winckel suggests, from a study of a case of his own, that its formation is due to an unfolding of the peritoneum before the upward-growing uterus. He examined the tissues of the ligament microscopically, but could find no muscular fibres.

Physiology and Symptoms.—The uterus bicornis may, in the performance of the functions pertaining to the normal womb, act like two independent organs. Thus, while menstruation may occur simultaneously from the two cornua, it is not unusual to see them alternately performing this function, and a periodical flow may continue to escape from one cavity after pregnancy has occurred in its fellow. If one side is occluded (bilateral atresia has never been observed), hydrometra or hæmatometra develops slowly, and here, as also with pyometra, rupture of the sac may take place and its contents be discharged into the vagina, into the better developed cornu, or into the abdominal cavity. Hæmatosalpinx is a frequent and early source of danger.

A considerable number of patients with two-horned uterus never conceive, but this is not due to the condition of the uterus, but rather to the fact that intercourse is carried on in the larger and occluded half of the accompanying divided vagina. Either half of a two-horned uterus may become gravid, the other horn participating in the subsequent hypertrophic and decidual changes. The fœtus may lie largely in one cornu while the placenta is adherent to the inner surface of the other. Sometimes pregnancy occurs first in one and then in the other horn, and in twin pregnancies, which are not uncommon, both ova may occupy the same or each a different cornu. The presentation varies largely with the grade of the rudimentary condition: in uterus bicornis septus and uterus bicornis unicolis, the vertex; with a common uterine cavity, the breech; in uterus arcuatus unicorporeus, transverse presentations are common. During labor, contractions may occur simultaneously in both horns of the uterus, or the empty horn may play an entirely passive part in the process of delivery. In twin births contractions of the two horns alternate, and delivery from one may be accomplished much earlier than from the other. Independence of action between the two cornua is observed most characteristically when independence of structure is most marked.

The course of utero-gestation and of the puerperium in individuals with uterus bicornis is usually uneventful, but labor is apt to be tedious, difficult, or dangerous. The non-gravid horn, the recto-vesical ligament, or the septum dividing uterus or vagina, may oppose barriers to the exit of the child which are difficult to surmount. Death from exhaustion is apt to ensue, and rupture of the lower uterine segment has been observed. In nearly every case some operative interference is called for to insure safe and rapid delivery. Placenta prævia is by no means uncommon, and post-partum hemorrhage is to be feared when the placenta is attached to the uterine septum.

Diagnosis.—When, from great breadth of the uterus or the presence of a divided vagina, uterus bicornis is suspected, a correct diagnosis is often arrived at by the introduction of two sounds into the womb. When their points cannot be approximated low down in the uterine cavity a partition is usually present, and if after further introduction they diverge markedly toward the respective sides of the pelvis, they have probably entered the independent cornua of a two-horned uterus. Diagnosis is facilitated also by the various combined methods of examination, and is especially easy when, after labor, the finger can be introduced through the dilated cervical canal.

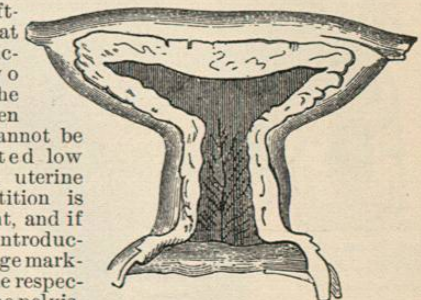


FIG. 4888.—Anvil-shaped Uterus. (After Oldham.)

Treatment.—The same rules governing the operation for the evacuation of fluid retained in the rudimentary cornu attached to a one-horned uterus, apply when a like result has followed unilateral atresia of a two-horned uterus, and the same complications originating in imperfect drainage and rupture of a tubal blood sac are to be feared. Puncture of the sac is best made at its most dependent part. Müller observes that when the head during delivery is impeded by the recto-vesical ligament, the correction of the obliquity of the pregnant horn, or placing the patient on the side corresponding to the non-pregnant half of the womb may suffice; but if not, podalic version and extraction should be attempted. Obstructing septa or bands may be pushed to one side or divided.

VII. THE TWO-CHAMBERED UTERUS: UTERUS BILOCULARIS; UTERUS SEPTUS, SUBSEPTUS, OR UTERUS SEPTUS DUPLEX.—*Anatomy.*—The two-chambered uterus is an organ rather broader than normal, but of perfect outward form except that there is usually some disparity in size between the two sides. A partition more or less perfect divides its cavity into two lateral portions. If this dividing wall extends from the fundus downward only for a short distance into the body of the womb, we have the sub-variety of uterus bilocularis known as uterus bilocularis unicorporeus or uterus subseptus unicorporeus; if to the level of the internal os, the designation uterus bilocularis unicollis, or uterus subseptus unicollis is employed; if to the external os, uterus bilocularis septus sive completus; when the partition extends only so far into the cervical canal that there is but one external opening (os) common to both chambers, the condition is termed uterus subseptus unifornis. The name uterus biforus supra simplex indicates that a septum is situated only in the neighborhood of the external os and that the cavity above is single. Occasionally the uterine partition is continuous with a septum dividing the vagina into two lateral chambers. As in other varieties of duplex uterus, the dividing wall is not always perfect in its structure, but may contain one or more perforations. Atresia of

ine life as uterus bicornis, or perhaps, better, to a slightly later time in the same period. The causes of the two anomalies are the same. The fusion of the Müllerian ducts has been complete, but the partition wall

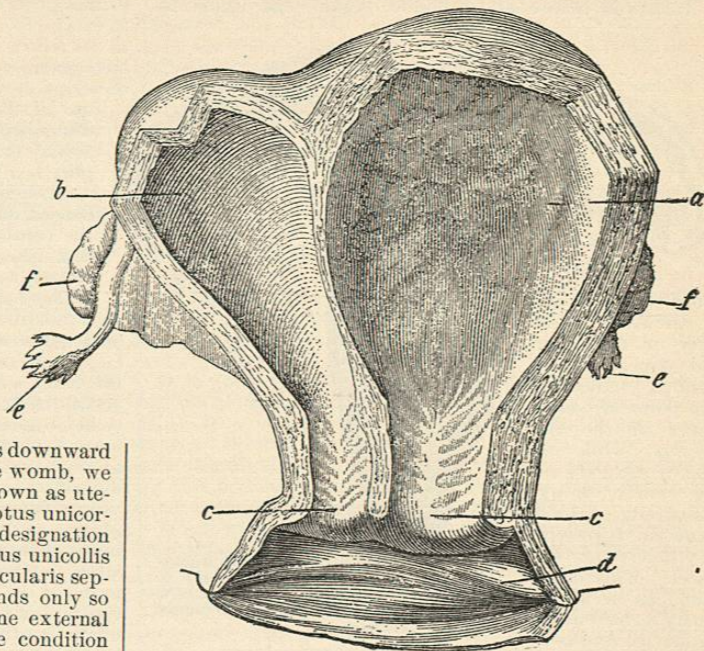


FIG. 4890.—The Same, Front View. Anterior walls removed.

has only partially disappeared, or else persists throughout.

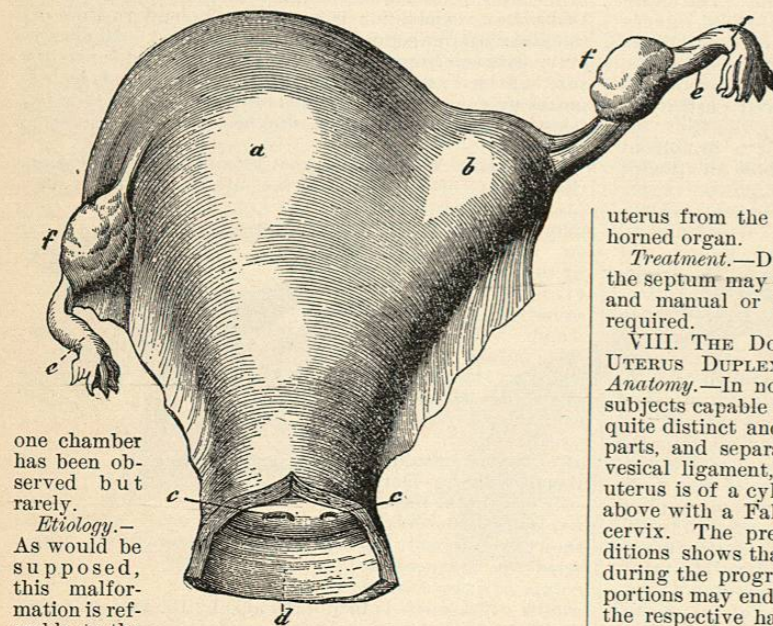
Physiology and Symptoms.—The two-chambered uterus, in so far as menstruation, conception, pregnancy, and delivery are concerned, in no way differs from the two-horned uterus.

Diagnosis.—On bimanual examination the uterus is found to consist of a single, somewhat broadened body, while two sounds introduced into its interior are prevented from touching by the dividing wall. With all the facilities at our command it is safe to say that, in the living subject, it is not possible to differentiate the two-chambered

uterus from the least rudimentary forms of the two-horned organ.

Treatment.—During labor, as in the uterus bicornis, the septum may interfere with the process of expulsion, and manual or instrumental assistance is occasionally required.

VIII. THE DOUBLE UTERUS: UTERUS DIDELPHYS; UTERUS DUPLEX SEPARATUS; UTERUS DIDUCTUS.—*Anatomy.*—In non-viable monsters, and occasionally in subjects capable of life, two uteri are sometimes found quite distinct and independent of each other in all their parts, and separated, sometimes widely, by the recto-vesical ligament, urachus, bladder, and rectum. Each uterus is of a cylindrical or conical shape, is continuous above with a Fallopian tube, and terminates below in a cervix. The presence of other grave anomalous conditions shows that quite a severe blow has been struck during the progress of development. Thus the cervical portions may end in the bladder, rectum, or cloaca, or in the respective halves of a septate vagina, which themselves terminate in these cavities. The uteri also may be solid throughout or a limited atresia of either organ may be present.



one chamber has been observed but rarely.

Etiology.—As would be supposed, this malformation is referable to the same period of intra-uter-

FIG. 4889.—Pregnant Uterus Bilocularis. (After Cruveilhier.) a, Right horn; b, left horn; c, external os; d, vagina; e, tubes; f, ovaries.

Etiology.—Before the eighth week of embryonal life, when as yet there has been no approximation or fusion of the Müllerian ducts, certain of the abdominal or pelvic organs, among which are the bladder and intestine, force their way between the ducts and prevent their union. The recto-vesical ligament is also, no doubt, an important etiological factor. As a result of this interposition the formation of a single uterine body is rendered impossible.

Physiology and Symptoms.—In double uterus the menstrual discharge does not seem to alternate between the two cavities. Either may be occluded, and either organ or both simultaneously may become gravid.

Diagnosis.—In the recognition of the rudimentary condition under discussion, it has been truly said that the presence of two vaginal portions are of the utmost diagnostic value; for since the tubes which coalesce to form the middle portion of the genital tract unite from below upward, two cervixes predicate two independent uterine bodies. If a sound is introduced into each uterine cavity, a finger inserted in the rectum can be pressed forward in a straight line without coming in contact with either uterus.

Treatment.—Retained menstrual blood is to be evacuated, and any obstacle offered to delivery is to be overcome by methods which have already been described.

IX. FAULTY OR DEFICIENT DEVELOPMENT OF THE UTERUS: HYPOPLASIA UTERI.—*Anatomy.*—Under this head are grouped a large number of associated conditions, in all of which the uterus is fairly well developed, but has not quite reached the type of structure usually found in adults. Thus it may retain in later life the characteristics of the organ as found at the time of birth (uterus fetalis), when the cervix is large and the body small, the whole possessing the shape of an anvil, while often an extreme degree of cervico-corporal ante-flexion exists. Again, it may be developed yet a little further, and though still unnaturally small, with thin walls, the body and cervix are of equal size, or the former is somewhat larger than the latter (uterus pubescens; congenital atrophy or hypoplasia of the uterus).

The walls are occasionally excessively thin and membranous (uterus membranaceus). The body and cervix may exhibit the same relative proportion to each other as in the perfectly developed uterus, but the whole organ perhaps is still deficient in size and possesses walls of abnormal thinness, while the plicae palmarum pass well up into the cavity of the corpus (uterus infantilis). All these forms are closely allied with one another, and with the least pronounced types of congenital malformation on the one hand and the normal adult uterus on the other. The term hypoplasia uteri may be used to include them all. As a rule, some of the remaining elements of the genital system show slight errors in development, and the ovaries are not infrequently rudimentary, or are sometimes entirely absent. The heart and the rest of the vascular apparatus may likewise be undeveloped.

Etiology.—Hypoplasia uteri cannot with justice be called a purely congenital condition. It is true that during the final months of embryonal life injurious influ-

ences, such as constricting peritoneal adhesions, may prevent a uterus almost completely formed from attaining anatomical perfection. But unhealthy systemic states (associated with disease of the vascular or nervous

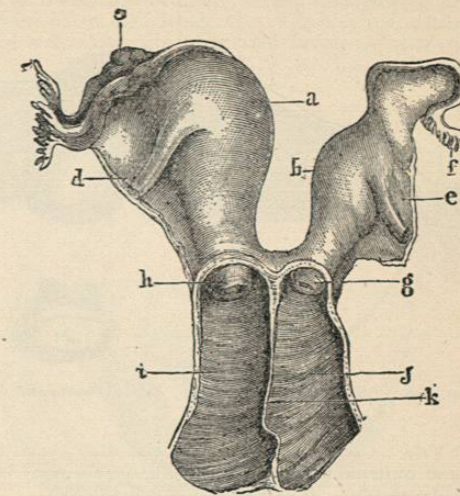


FIG. 4892.—Didelphic Uterus and Divided Vagina. (Olivier.) a, Right segment; b, left segment; c, d, right ovary and round ligament; e, f, left ovary and round ligament; g, h, left cervix and vagina; i, j, right cervix and vagina.

system) during infancy or childhood, and lack of ovarian stimulation when these glands are absent or rudimentary, may bring about a like result.

Physiology and Symptoms.—It is the condition of the ovaries rather than that of the uterus which determines largely the nature and degree of the disturbances which accompany hypoplasia uteri. Menstruation may not appear at all, or may be scanty, irregular, and painful; and pregnancy, when it takes place, is not unlikely to end in abortion.

Diagnosis.—If, upon examination, the uterus is found to be less than two inches in length; if the cervix is larger than the body; and if the uterine walls are thin and membranous, even with a cavity which measures a little over two inches, the condition is one of hypoplasia; though we should be careful to exclude uterus unicornis before expressing a final opinion.

Prognosis.—In many cases a hypoplastic uterus will of itself, or in consequence of appropriate treatment, or of pregnancy, take on further growth, and ultimately attain normal proportions.

Treatment.—When the general condition is good; when the ovaries are present and are not excessively atrophic, and when the uterus is not too small, much can be done for the relief of amenorrhœa, or dysmenorrhœa with scanty menstruation, by the employment of the well-known local uterine irritants, and if these fail and suffering is excessive, castration in suitable cases should be resorted to.

X. SLIGHTER DEVELOPMENTAL ANOMALIES OF THE UTERUS.—1. *Obliquitas Uteri quoad Formam.*—From deficient development of one Müllerian duct, and from the traction exerted by a broad ligament shortened by fetal inflammation, one side of the uterus may be somewhat smaller than the other, and the organ is thus made to occupy an oblique position in the pelvis (Fig. 4894).

Dysmenorrhœa and sterility usually accompany this condition.



FIG. 4893.—Infantile Uterus. (Schnöder.)

2. *Congenital Ante-, Retro-, and Lateropositions of the Uterus.*—The uterus, although normally formed, may be situated too near the anterior, posterior, or lateral wall of the pelvis. If displaced laterally, it is usually toward

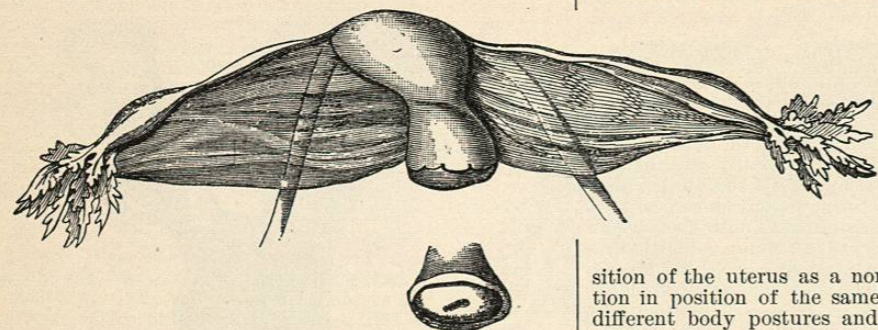


FIG. 4894.—Obliquity of the Uterus. (After Tiedemann.)

the left side. Contraction of one or the other broad ligament, and unusual size of neighboring organs, may bring about this result.

3. *The Double-mouthed Uterus: Uterus Biforus.*—An antero-posterior partition may divide the external os into two lateral halves, the cervix and uterus being otherwise normal in every particular. As in other forms of septate uterus, of which this represents the least pronounced type, the dividing band may offer an obstacle to the passage of the presenting fetal extremity, and may, when ruptured, either cause considerable hemorrhage or form a starting-point for septic infection. If the septum during labor cannot be pushed aside, it can with safety be ligated in two portions and divided.

4. *Abnormal Plication of the Cervical Cavity.*—In this condition a fold of tissue, not unlike a second portio vaginalis, projects into the cervical canal, causing hemorrhages occasionally, and leading also to tedious labor. Incision or ablation is sometimes indicated.

5. *Abnormal Communications with the Uterus.*—The uterus may either open into the cloaca, or have faulty communications with different portions of the urinary system, or with the rectum. A case is on record in which one side of a uterus bipartitus opened upon the external surface of the body.

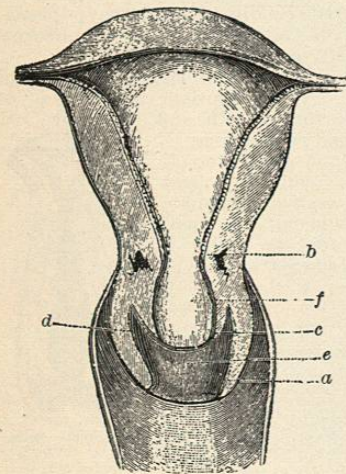


FIG. 4895.—Abnormal Plication in the Cervical Cavity. (After P. Müller.) a, Os externum; b, os internum; c, d, abnormal fold; e, f, cervical cavity.

and to become pregnant in this peculiar situation, Cæsaræan section being thereby necessitated.

George Woodruff Johnston.

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UTERUS, DISEASES OF: DISPLACEMENTS.

—A displacement of the uterus may be defined as a permanent departure from a normal position, and is therefore to be sharply distinguished from a temporary normal deviation. One reason for the slowness of investigators in the past to agree upon any position of the uterus as a normal one has been the variation in position of the same uterus when examined in different body postures and under different conditions of distention of the bowels by gas or fæces, or of the bladder by urine. In the perfectly normal pelvis the range of mobility is great, the condition being one of delicate poise maintained by the resultant of various forces, while the supporting structures are elastic, and some of them (round ligaments) are contractile.

Several structures more or less yielding and elastic serve to maintain the uterus in position. The upper portions of the broad ligaments at the sides and the round ligaments forward and laterally serve chiefly as stays or guys. Connective tissue in the lower portions of the broad ligaments, together with the so-called uterosacral ligaments and bladder attachments in front, serves as a kind of sling attached low down on the organ, and gives support to its weight. The most important supporting structures are the muscles and fascia of the pelvic floor, chiefly the levator ani and coccygeus muscles, and the internal pelvic fascia with the perineal fascia (Fig. 4896). Another supporting influence may be likened to hydrostatic pressure. When the pelvic floor is intact, the tonicity of its muscles and of those of the abdominal wall serves to some extent to float, as it were, all movable bodies in the abdomen. This support is greatly reduced when the abdominal parietes have lost their normal tone.

The uterus moves with the whole pelvic diaphragm in the acts of vomiting, violent coughing, or straining in defecation. As it is attached to the bladder by a comparatively broad surface, the constantly varying distention of that organ swings the upper part of the uterus forward and backward. A range of normal mobility of several inches can be demonstrated without instrumental traction by contrasting the position of the cervix when the patient is in the standing position, with its position in the knee-chest posture after air distends the vagina. Under anæsthesia the cervix may with a tenaculum be drawn to the vaginal outlet without injury.

It must be understood that nearly all illustrations of the female pelvis are misleading, in that for the sake of clearness the vagina, bladder, and rectum are represented as distended, whereas the walls of the empty organs are in contact and occupy very little space.

The normal uterus is poised in the pelvis, the organs

being empty, the cervical portion almost central and as high as the top of the symphysis pubis, the fundus inclined forward almost horizontally and at times a little to the right or left to accommodate the rectum. The fundus is readily felt by the examining hand near the pubic bone, behind and below a line joining the promontory of the sacrum with the top of the symphysis (Fig. 4897).

CAUSES OF DISPLACEMENT.—Congenital defects of development result in some changes of position, chiefly backward deviation of the axis or a curving of the axis of the organ forward upon itself. These congenital alterations are usually accompanied by an imperfect development of ovaries and tubes, as well as of the uterus, though the external genitalia may be normal. The accompanying dysmenorrhœa and sterility are usually difficult to overcome.

Acquired displacements may be due to sudden strains, especially downward strains, to the slow action of tumor pressure, of gravity, of intra-abdominal pressure, or of contraction of inflammatory adhesions, while among contributing causes are laceration of the pelvic floor, subinvolution after labor, hyperplasia, œdema, passive congestion, general loss of muscular tone, faulty dress, constipation, infrequent emptying of bowel and bladder.

Sudden or acute displacements are usually backward and downward. They occur in persons who have sustained laceration or overdistention of the pelvic floor, though a few cases have been reported in which the cervix has appeared through the vulva in the virgin as the result of strain, and it is not very uncommon to have the fundus forced backward into acute retroversion in the unmarried. The history of the case usually shows that strain had been applied while the person was in an extreme stooping posture, as in lifting a heavy weight from the floor, or it may result from a fall upon the nates. One of the writer's patients, when a girl of fifteen years, previously perfectly well and totally unconscious of her anatomy, while lifting the corner of a heavy cook stove and trying to put a block under it, felt something "give way." Great pain in the lower pelvis and back followed, confining her to bed for a few days. There was soreness in walking, lasting months. The uterus remained in retroversion, and was an element in a disability which had continued for years until completely relieved by operation. Another patient, with a rather fat abdomen and an impaired pelvic floor, suffered acute retroversion while stooping and lifting the tray of a trunk. There were acute pain in the pelvis and back, frequent urination, and pain down the thighs. The uterus was caught below the promontory of the sacrum. Immediate relief followed the reduction of the displacement. In the extreme flexion of the thighs or the abdomen, not only is the muscular support of the perineum relaxed, but considerable pressure is made by the thighs upon the abdomen. The relief obtained in the squatting position, naturally assumed by some persons in extreme cases of difficult defecation, illustrates the mechanical principles involved. The uterus when suddenly forced down and back is most likely to be caught below the sacral promontory when the organ is somewhat enlarged by an early pregnancy or when the promontory projects well forward.

Laceration of the pelvic floor and imperfect involution after labor are the two chief elements in the production of *gradually acquired* displacements. The lacerations which occur during labor are not to be regarded as involving only the perineal body and the outlet of the vagina. A very complicated series of changes has taken place in the whole pelvic diaphragm. Planes of fascia are torn, and they slide one upon the other. Their attachments are pulled away, especially from the central areas. Great muscle planes are relaxed and torn apart, so that the levator ani, the coccygeus, and co-ordinating structures act less perfectly as a sling for the support of the pelvic viscera. If the upright position is resumed too early after confinement, and if the patient takes too little rest, not only the uterus but all the pelvic tissues fail to regain their normal tone. The uterus remains soft, large,

and flaccid, and under the mechanical influence of gravity and imperfect support an exceedingly complicated change of relation of parts follows, infinitely varied according to the integrity of the holding power of uterine parts; but the uterus tends slowly to descend, tilting backward as an early step; the vaginal walls, becoming lax and redundant, are protruded before the descending

bladder and rectum, until in extreme cases a true hernia of pelvic contents and even small intestine takes place through the pelvic outlet.

The contraction of adhesions which result from inflammatory disease in the abdomen, is responsible for some well-marked uterine displacements, especially those in a backward and those in a lateral direction. When, for example, a collection of pus, two or three inches in diameter, forms behind the uterus and broad ligaments, a heavy wall of plastic exudate unites the uterus and upper edges of the broad ligaments to the large intestine behind or to both large and small intestines, the omentum still further covering in the mass. Should this pus escape into the bowel or bladder or by the slow process of absorption disappear, the limiting wall of adhesions, following the shrinkage, slowly contracts around the remains of the mass. This contraction will in some cases fix the uterus and tubes, pulling the former slowly back over the disappearing pus sac. The influence of other causes which have been mentioned is obvious without detailed description.

VARIETIES.—The varieties to be described are: Upward, lateral, forward, backward, and downward; the organ may also occupy various hernial sacs, or may be completely turned inside out, the so-called inversion.

Upward displacement of the uterus is seen only as the result of the growth of tumors. A dermoid cyst of the ovary for example, or a nodule of a fibroma of the uterus, may become adherent in the pelvis behind the uterus, and by its growth push that organ out of the pelvic cavity entirely. Uterine fibromas which completely surround the uterus, grow too large for the pelvic cavity, and drag the uterus and bladder upward, stretching the vagina, so that on examination the os uteri is found to be completely beyond the reach of the finger. The treatment is determined by ordinary surgical principles in the removal of the growths, should that be called for.

Lateral displacement may follow contraction of plastic exudate or adhesions about an obliterated pelvic abscess.

FIG. 4896.—Diagram showing Arrangement of Pelvic and Perineal Fasciæ. (Tarnier.)

INTERNAL PELVIC FASCIA

THREE LAYERS OF THE PERINEAL FASCIA

being empty, the cervical portion almost central and as high as the top of the symphysis pubis, the fundus inclined forward almost horizontally and at times a little to the right or left to accommodate the rectum. The fundus is readily felt by the examining hand near the pubic bone, behind and below a line joining the promontory of the sacrum with the top of the symphysis (Fig. 4897).

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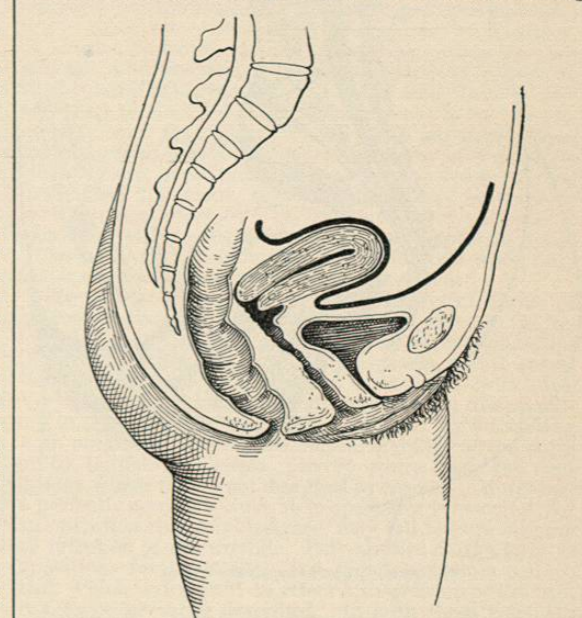


FIG. 4897.—Normal Position of the Uterus.

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