

In rare cases, the vagina has been found *double*, like the womb, sometimes with two uteri, and at others with only one. I once saw a case of this kind myself, in which connection could be effected perfectly in either of the two passages, each having a perfect external mouth and sphincter muscle of its own, one being below the other.

The uterus is variable in different animals, in many ways. In some it is single, as in the human species, while in others it is double, triple, and even quadruple. It is globular, ovoid, elongated, or triangular. In the apes the uterine walls are very thick, as in the human being, while in many other animals they are quite thin, almost like the bladder. When the walls are thick, and the internal cavity small, the changes which the womb undergoes during gestation are very remarkable. It increases wonderfully in size, and its small mouth expands sufficiently to allow of the birth of the new being, after which it contracts again to nearly its former condition. In the double uterus, as in the rabbits, where many young are formed at once, each one is partly inclosed in a separate enlargement, connected with the others by a narrower part. In the marsupials the womb undergoes but little change, because the young is retained there so short a time, and leaves it while very small.

The Fallopian tubes differ but little in different animals, except in length, and in being more or less straight or twisted. In viviparous animals they terminate in the uterus, and in the ovipara in the cloaca.

The *vagina*, and its mouth, the *vulva*, vary as much as the penis does in the male, and correspondingly, because it is in them that the penis is inserted, in the act of copulation. Its size, length and form, are therefore always proportionate to that organ. In some animals it has great power of constriction, and closes firmly on the male organ till copulation is complete, as in the dog.

The clitoris is usually present, and is as variable as the other parts. It is always the principal seat of pleasurable sensation, and those animals in whom it is large are very lascivious, as the apes for instance. In the female bear it is very long, and curved like a double S. In marsupials it is double, like the male penis. In those animals in which we find a bone in the male penis there is also one in the female clitoris.

In the hyena the vulva is cross-wise, instead of length-wise of the body, as in other animals. In form it is usually long oval, but is sometimes round. Its situation is commonly near the anus, but in the lamantine they are eight inches asunder, while in the marsupials the two orifices are united in a common ring.

Instances have been noticed, in the human being even, of all these organs, womb, vagina, and clitoris, being double, as in some other animals.

HUMAN MALE ORGANS.

The course of the semen will be readily understood from the following illustration, which is made simply diagrammatic, so that the relative positions and connections of the parts can be better understood. It is formed in the *testicles*, of which the left one is shown in the scrotum (1). From the testicle the semen passes up the tube called the *vas deferens* (2), which runs up the side of the bladder and around the back of it, where it enters the *seminal vesicle* (3), and from that passes along the *ejaculatory canal* (4) (which is only a continuation of the *vas deferens*), and enters into the urethra (7) through two small openings, called the *seminal ducts*, just

In some cases the vesicle has been found double, like the nymph sometimes with two parts, and in others with only one. I once saw a case of this kind myself, in which connection could be effected, certainly in either of the two passages, each part of a perfect external mouth and sphincter muscle of its own, one being below the other.

The ureters are variable in different animals, in some they are double, in the human species, while in others it is double, triple, and even quadruple. In the dog, the ureters are double, and in the cat they are triple. In the sheep, goat, and in the human being, while in many other animals they are double, and in some like the bladder. When the walls are thick, and the internal cavity small, the changes which the sperm undergoes during passage are very remarkable. It is very considerably in size, and its small mouth expands sufficiently to allow it to pass at the neck, after which it contracts again to nearly its former condition. In the human species, as in the dog, the young are formed in each of the two parts, and are partly enclosed in a separate membrane by a number of folds, in the human species, the changes become the same.

PLATE XVI.

THE HUMAN MALE GENERATIVE ORGANS.

Figure 1. A. The bladder. B. The spermatic cord, which is composed of the spermatic artery and spermatic nerve, going to the testicles, and the spermatic vein and vas deferens leading from it. These are all contained in one sheath, as will be seen. The opening through which all these are connected with the interior of the body is the one through which most ruptures occur. It is called the *inguinal ring*, and is in the groin. cc. The vas deferens. E. The mons veneris. F, G. The muscles which corrugate the scrotum, and raise the testicles. I. The skin thrown back. J. The pubic bone. K. The ischiac bone. N. The under part of the penis. M. The scrotum. P. The glans penis. Q. The seminal vesicle. R. The prostate.

Figure 2 shows the connection between the vas deferens, seminal vesicles, and ejaculatory canal. a. End of the right ejaculatory canal. b. A portion of the right seminal vesicle thrown back. cc. Cells of the vesicle. e. A cut through the wall of the vesicle. f, g. The two vas deferens. h. The left seminal vesicle, not cut open. ii shows the external appearance of the vesicle. j. The end of the ejaculatory canal.

THE HUMAN MALE GENERATIVE ORGANS.

The course of the sperm will be readily understood from the following description. It is a simple, unbranched, so that the relative position and connection of the parts can be better understood. It is formed in the testicle, of which the sperm is shown in the scrotum (1). From the testicle the sperm passes up the tube of the vas deferens (2), which runs up the side of the bladder and around the neck of the bladder (3), and from that point passes along the spermatic cord (4) (which is only a continuation of the vas deferens), and enters the bladder (5) through two small openings, called the vesicular ducts, but



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below the *veru montanum* (6). The urethra is the passage common to both the urine and the semen, and down this the semen flows whenever there is an emission, as during connection. It is quite a long course from the testicle where the semen is made, to the end of the penis where it is finally expelled.

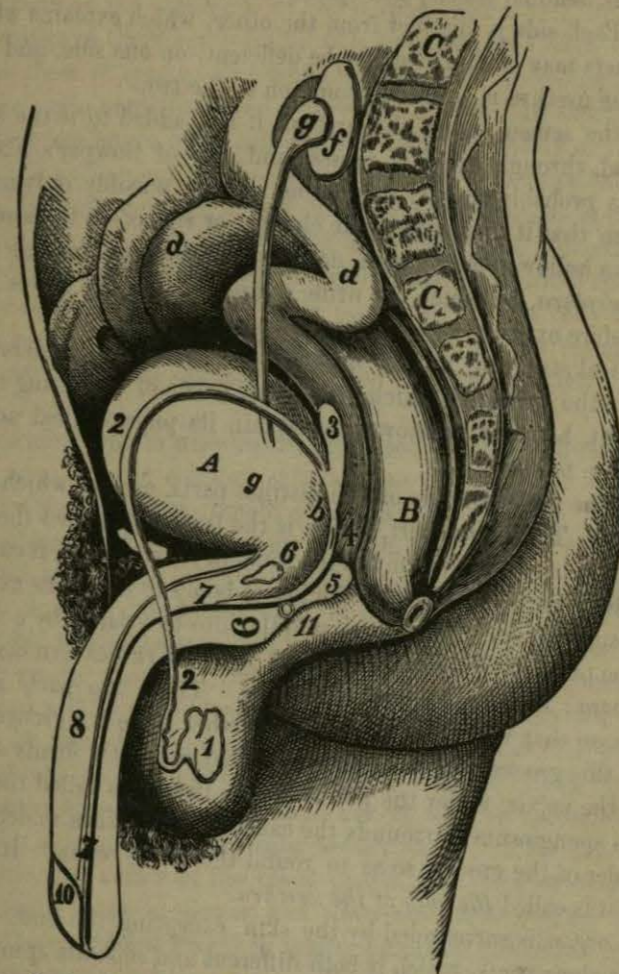


FIGURE 73.—Section of the Male Pelvis, to show the Situation of the Different Parts.

A. The bladder. B. The rectum, or end of the large intestine. c. The lower part of the back bone, or sacrum. dd. The small intestines. f. One of the kidneys. gg. The ureter, or tube which conveys the urine from the kidneys into the bladder.
 1. The left testicle. 2, 2. The vas deferens, or tube which conveys the semen from the testicle. 3. The left seminal vesicle, with which the vas deferens is connected. 4. The ejaculatory canal, into which the semen next passes. 5. The prostate gland, with which the ejaculatory canal connects, and through which the semen passes into the urethra or urinary passage from the bladder (7). 6. The *veru montanum*, or small protuberance which partly closes the neck of the bladder. 7, 7. The urethra, or passage by which the urine escapes from the bladder down the penis. 8. The upper part of the penis, or corpus cavernosum. 9. The lower part, or corpus spongiosum. 10. The glans, or head of the penis. 11. One of Cowper's glands.

The use of the penis in copulation, it will be seen, is to convey the semen into the female vagina.

This illustration does not of course give the exact appearance of the organs, nor show their structure. It is intended merely to explain their position and connection ;

it is a *key* to the large one, which will show them as they really appear, and exhibit their structure. By this illustration also the course of the semen can be fully understood, which it could not be unless the parts were arranged in this manner. The body being supposed cut through, the organs are shown only on one side. There is a testicle, vas deferens, seminal vesicle, and ejaculatory canal on each side, all these parts being double. Each side is distinct from the other, which explains why the testicle and all its adjuncts may be destroyed, or be deficient, on one side, and yet be perfect on the other—the urethra is of course common to the two.

As soon as the semen enters the urethra it has added to it the secretion from the prostate gland, through which it passes, and also of Cowper's gland, close by. These secretions probably modify it in some way, or possibly only act as diluents. It is thought also that it undergoes some change, or ripens, in the seminal vesicles.

The penis is a hollow spongy organ down which runs the passage from the bladder, called the *urethra*, by which the urine escapes, which also serves for the exit of the semen, as before explained.

The anatomical structure of this organ is not thoroughly understood by anatomists, owing to the difficulty which necessarily exists of dissecting it in its several states. Sufficient, however, is known to explain its physiological action, which is all we now require to know.

The body of the penis consists of two distinct parts, each of which is very porous, or rather spongy. The upper part, which is the largest, is called the *corpus cavernosum*; the under part, which is much the same in its structure, is called the *corpus spongiosum*. Both parts extend from the pelvic bones to the glans at the end. The corpus cavernosum is divided down the middle into two parts, by a septum, or partition, and some physiologists on that account speak of *two* cavernous bodies, or the *corpora cavernosa*; it is, however, strictly one. These two parts are rounded on the under edge, so that when they come flat together there is a groove formed underneath, and in this groove lies the urethra. They are both firmly attached to the front bones of the pelvis, under the perineum, by two roots called the *crura penis*.

The corpus spongiosum surrounds the canal of the urethra underneath, and fills up the remainder of the groove, so as to round the whole organ. It terminates posteriorly in what is called the *bulb of the urethra*.

The whole organ is surrounded by the skin, excepting the end, where we find a body called the *glans penis*, which is both different and separate from either of those described. The inner fold of the skin of the penis is attached to the termination of the corpus cavernosum, while the outer fold is extended beyond, so that it only partly covers the glans, but is not attached to it, and may be drawn back. This loose skin is called the *prepuce*, or *foreskin*, and is the part cut off in the rite of *circumcision*. In some persons it extends farther over the glans than it does in others, but generally leaves more or less of it exposed. The glans is probably an enlargement of the peculiar erectile tissue surrounding the urethra, and is covered by a highly sensitive and vascular skin, of an exceedingly delicate structure. It is in the form of a section of a cone, and terminates on the posterior or upper margin of an elevated ridge, called the *corona glandis*, behind which is a depression called the *cervix*, or neck. In this depression are several glans called the *glandula odorifera*, which produce a whitish secretion, of a peculiar odor, that sometimes accumulates in great quantities in those who neglect proper cleanliness. On the under side of the glans the prepuce is attached nearly at the end by a cord or ligament, called

the *frænum*, or *ligamentum præputii*. This ligament, or cord, is sometimes too short, and during erection is so pulled upon as to cause great annoyance; occasionally it even ruptures, or tears, causing severe pain, with loss of blood.

These parts constitute the substance of the penis, and are therefore most essential to the performance of its proper functions.

The peculiarity of the structure of the corpus cavernosum, and of the corpus spongiosum consists in their being full of curiously arranged blood-vessels and cells, or cavities, like those of *sponge*, all communicating with each other, and being connected with the main branches of an artery and a vein. In ordinary states these vessels, excepting the larger ones, and also the cells, are nearly or quite empty, but under appropriate excitement the blood from the artery is impelled into them and fills them up, in consequence of which the organ enlarges, like sponge when filled with water. This is called the phenomenon of *erection*, and it depends upon a peculiar sensibility proper to the parts, which are therefore sometimes spoken of as being composed of *erectile tissue*. There is no other part of the body that in any way resembles the penis in structure, except the *clitoris* in the female, which has a similar tissue, and is usually capable of erection to a certain extent, in precisely the same way.

When the excitement is withdrawn, the blood ordinarily flows back by way of the cavernous vein, and the erection subsides, but sometimes its return is prevented and the erection then remains, though all excitement is gone. The corpus spongiosum is so distinct from the corpus cavernosum that erection will sometimes take place in one and not in the other, which necessarily curves the organ, or draws it into the form of a bow, producing what is termed a *chordee*. The erection and emission of semen is also assisted by a number of different muscles, particularly by one called the *erector penis*, or *ischio cavernosus* muscle. Sometimes in erection the rush of blood will be so sudden and violent that the vessels will burst, and the erectile tissue be thus totally destroyed. In some persons the filling up of the blood-vessels always occurs in a very short time, while in others it is the reverse; and in like manner the erection subsides in a short time in some, while in others it will continue for a long period and subside very slowly. This depends upon some peculiarity in the vital action of the blood-vessels, not yet understood. In old age the blood generally flows in slower, and flows out much quicker than it does in youth, so that the erection is longer in taking place and goes down more rapidly.

The uses of the penis, as before remarked, are twofold. Firstly it serves as a conduit to convey the urine from the body, and secondly as a conductor to carry the semen into the female organs. For the first use erection is not necessary, but it is for the second, and therefore its proper occurrence is both natural and essential to the performance of one of the functions of our nature.

The form of this organ varies in different animals, for the purpose of adaption, and is sometimes very singular. In some it is covered with *spines*, which give great pain to the female during connection, as in the cat, while in others its structure causes that act to be much lengthened, as in the dog. In birds, the male organ is merely rudimentary, so that there is no actual union, properly speaking, but merely an *emission* into the female organs. In the human being there are occasional deviations from the ordinary development, and sometimes even peculiarities in structure. Thus instances have been known of the interior of the corpus cavernosum being more or less ossified, so that a distinct bone always existed in

PLATE XVII.

STRUCTURE OF THE PENIS AND TESTICLE.

Figure 1. The penis seen underneath. *aa*. The corpora cavernosa. These are the bodies that swell up and cause *erection*, when the blood fills them. *b*. The glans penis, at the base of which may be seen the little glands which secrete the white odorous matter which is often formed under the prepuce. *dd*. The prostate gland. *ee*. Cowper's gland. *jj*. The vas deferens. *kk*. The seminal vesicles. *l*. The membranous part of the urethral canal. *m*. The bulb of the urethra. *oo*. The ureters, or canals bringing the urine from the kidney to the bladder.

Figure 2. The penis split open, and seen from above. *aa*. The corpora cavernosa. *bb*. The glans penis. *c*. The fossa navicularis. *ccc*. The canal of the urethra. *dd*. The prostate. *f*. The veru montanum. The two larger openings seen by the veru montanum are those by which the semen enters the urethra, the smaller ones are those by which the prostatic secretion enters. Still farther down, about an inch, is seen the opening where the secretion comes in from Cowper's glands. *hh*. The fibrous partition between the two parts of the prostate gland. *nn*. Part of the bladder. *pp*. Openings of the ureters. *vvv*. The corpus cavernosa laid open to show the vessels.

Figure 3. A section on the medial line of the urethra, *c*, *i*, and of its bulb, *m*, *e*. Cowper's gland.

Figure 4. Veins and arteries of the testicles. *j*. The vas deferens. *s*. Its continuation into the epididymus. *t*. The head of the epididymus. *u*. The testicle covered with its membrane. *vv*. The veins, and *yy* the arteries of the testicle.



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the middle of the organ. This is often the case in negroes, and in some of the lower animals it is natural. In a few rare instances the penis has been found *double*, or rather divided into two parts, only one of which, of course, contains a urethra, though both being capable of erection as I observed in one case in my own practice. Probably amputation of the imperfect part might have been safely effected, but as little inconvenience was experienced it was not thought necessary.

The various peculiarities of structure and development that interfere with the functions of this part will be treated under appropriate heads as we proceed.

ABSENCE AND MALFORMATION OF THE PENIS.

Besides being liable to be lost by several accidents, and by necessary operations, the penis may be also deficient from birth. I have seen instances where it was not more than a quarter of an inch in length, and sometimes only a slight swelling, like the top of a small tumor. In such cases, of course, there can be no *connection*, but still such men may be *fathers*, providing all the other parts are perfect, because, as before explained, the semen may impregnate if it be only shed *within the external lips*, which of course may be effected in the worst of these deficiencies. I have known instances of married couples, with families, who never had any association, from similar causes. It is unnecessary to say, however, that marriage should *never* take place in such cases without the nature of the infirmity being first known, though I believe the law would declare any marriage binding if impregnation was possible. In giving an opinion under such circumstances, it is, however, difficult to decide this point. In general, in healthy females, the placing of the semen artificially in the vagina will induce conception, but not always. Hunter relates an instance where he advised the injection of the semen with a syringe, after its escape from the husband, and impregnation followed. There are some females, however, in whom its absorption will not take place without a certain amount of excitement, dependent upon actual association, so that there will always be more or less uncertainty, and much less probability than when no such deprivation exists. Independent of this, however, there are other considerations that should forbid the marrying of men so situated, unless with a full knowledge of the circumstance and its consequences by *both*. In some of these cases, especially, when a portion of the organ is left, as after operations and accidents, the difficulty may be much remedied by an instrument, so constructed as to fit on the part remaining, and resembling that which is lost. I have known instances of conception following the use of such an instrument, when the penis itself was not more than *a quarter of an inch* long. But then the semen was formed in great quantities, and was remarkably healthy.

In some children the penis is tied down to the scrotum, or some other of the neighboring parts, by bands, which never allow it to be extended, and of course prevent the performance of its proper functions. I saw one child of seven years in whom it grew flat on the abdomen, causing great trouble and annoyance in urinating, from the direction in which the fluid had to flow. Nearly all such cases can be easily corrected by a slight operation at any age, the adhesion being usually only by the skin, but they are better attended to early in life. The one referred to was put right very readily, and in two years' time scarcely a trace of the operation could be seen.