

Occasionally the penis will have a wrong *direction*, being turned so much either on one side, under, or upward, that association is impossible. If this depends upon contraction of the skin, or of the muscular fibers, it may be corrected by simply dividing them; but if it results from a tumor, or swelling, that must be removed before any alteration can be effected. Aneurisms, and swellings of the veins will sometimes bring about such deviations, and so will too long-continued erection, by rupturing some of the cells or vessels, and so causing accumulation of blood. I knew one instance of this kind in which every time erection occurred a large tumor was formed on the left side, full of blood, which of course turned the end of the organ to the right side, and thus prevented connection. This accident had been caused by numerous forcible and long-continued erections in one night, during intoxication. The tumor was as large as an egg, and when full could be distinctly felt to pulsate. It was also very painful, and appeared almost ready to burst. The remedies proposed were cold astringent lotions and wearing a thin plate of smooth horn over the part, bound on so firmly as to prevent any swelling from accumulation of blood. This plan succeeded very well in giving relief, though it is probable there will always be more or less tendency to a recurrence of the trouble.

Besides scrofulous and other tumors in the penis, there will sometimes be bony swellings, and accumulations like calculi or stone in the bladder. These may either compress the urethra, and so prevent the passage of the urine and semen, or they may curve the organ so as to prevent its use; in general, however, they can be removed.

Sometimes the frænum or cord that binds down the prepuce at the end underneath, will be so short or contracted that during erection the point of the glans will be pulled under. This not only prevents the semen being thrown straight forward, but even prevents connection in many instances, either by causing severe pain, or by bending the end of the organ too much. This difficulty is easily remedied, by cutting through the cord with a pair of scissors, or a lancet. I advised a gentleman out West how to do this, in a letter, and he wrote afterward to inform me that he had succeeded perfectly, with his *razor*. It is simply necessary to take care to cut only deep enough to *just sever the cord*, and afterward to keep the parts stretched asunder, so that they do not grow together again; a simple dressing of cloths dipt in *cold water* is all that is required after. I have known the cord to be eaten through with caustic, but the plan is not so good as cutting, being more tedious and painful, and leaving a larger scar. In some persons it has been broken suddenly during a violent erection, or on attempting coition, but such accidents are always painful, and are better avoided by a timely operation.

#### WANT OF DEVELOPMENT, OR CONGENITAL SMALL SIZE OF THE PENIS.

It is sometimes difficult to say whether the penis is *too short* or not, because there is no precise standard or limitation, and in different people the development varies very much. In some persons it never grows from the condition in which we find it in childhood, while in others it will attain a medium size, and in others again it will be nearly rudimentary. This may also be totally independent of any deficiency in the other organs, though most usually they correspond more or less. Thus I have seen a man of forty years of age in whom the penis was only two inches long, and about as thick as the little finger, but whose testes were of a full average size, and who had

strong sexual feelings, with a full flow of semen. Sometimes the organ can scarcely be traced at all, being merely like a wart or small tumor.

When the non-development of the penis is dependent upon a general torpor of the genital organs, more especially of the testes, their action must be aroused, and their functions fully established, in the manner pointed out in the chapter on the testes. If this can be done, the penis may be made to grow even to an advanced period of life, as I have there shown.

In those cases in which the penis alone is not sufficiently developed, a different treatment is required, as it is simply a local effect we wish to produce. In some of these instances the organ, though small, is capable of perfect erection, and both connection and impregnation may be effected by its means; it is not, then, a matter of such urgent moment for any improvement to be effected, though under certain circumstances it may be desirable. More frequently, however, erection either does not take place at all, or so imperfectly, that coition is impossible, and the flow of semen is so imperfect and irregular that impregnation can seldom be effected, even artificially. Under such circumstances, it is a matter of the greatest consequence to produce an increased development, so that both these functions may be performed; and it may be both new and pleasing, to many persons, to learn that there are means by which this desirable end may be often attained, even under the most unpromising circumstances. It is proper to remark, however, that the cases now referred to are those in which the small size is *congenital*, or existing from birth, and not those in which the organ has *decreased*, from disease or excess, after having been of average development, though even in many of them, when the constitutional stamina is not too much impaired, the same means will frequently restore what has been temporarily lost.

The causes that prevent the proper development of this organ, as well as of others, are of course unknown in those cases that are congenital, because they operate before birth, but in those that become arrested during childhood or youth, we generally trace it to early masturbation, blows on the testicles and other accidents, or to some severe disease which has impaired the vital energy very much. Some diseases are particularly apt to affect young persons in this way, as the *mumps* for instance, which often make the testes swell.

Scarlet fever and measles, when severe, I have known to seriously injure the virile power, but not so frequently as rickets or scrofula.

A similar deficiency is sometimes found in females; in some the uterus or ovaries being very small, though the vagina may be large enough to allow of coition, while in others these organs will be of usual size, but the vagina will be too small, so that marriage is not allowable. In another place I refer to such cases, and explain what can be done to relieve them.

To effect an enlargement of the penis, in addition to every means proper to improve the general health and impart stamina, there are certain *mechanical* and *manual* applications, the effects of which, under right direction, are often of the most unexpected and pleasing character. To understand the nature of these, and their mode of action, it is necessary to bear in mind the anatomical structure of the organ, and the requisites for erection. That phenomenon, it will be recollected from our previous description, depends essentially upon the filling up of the vessels and cells of the spongy and cavernous bodies with blood, and of course, if there be any fault in their make or mode of connection, or if the blood does not flow into them, erection

cannot take place. Now this is precisely the fault that is found to exist in most of the cases of non-development above referred to, and is what requires to be corrected. On dissecting such cases after death we find that the cells and minute vessels have never been congested or filled with blood, and consequently the organ has never been

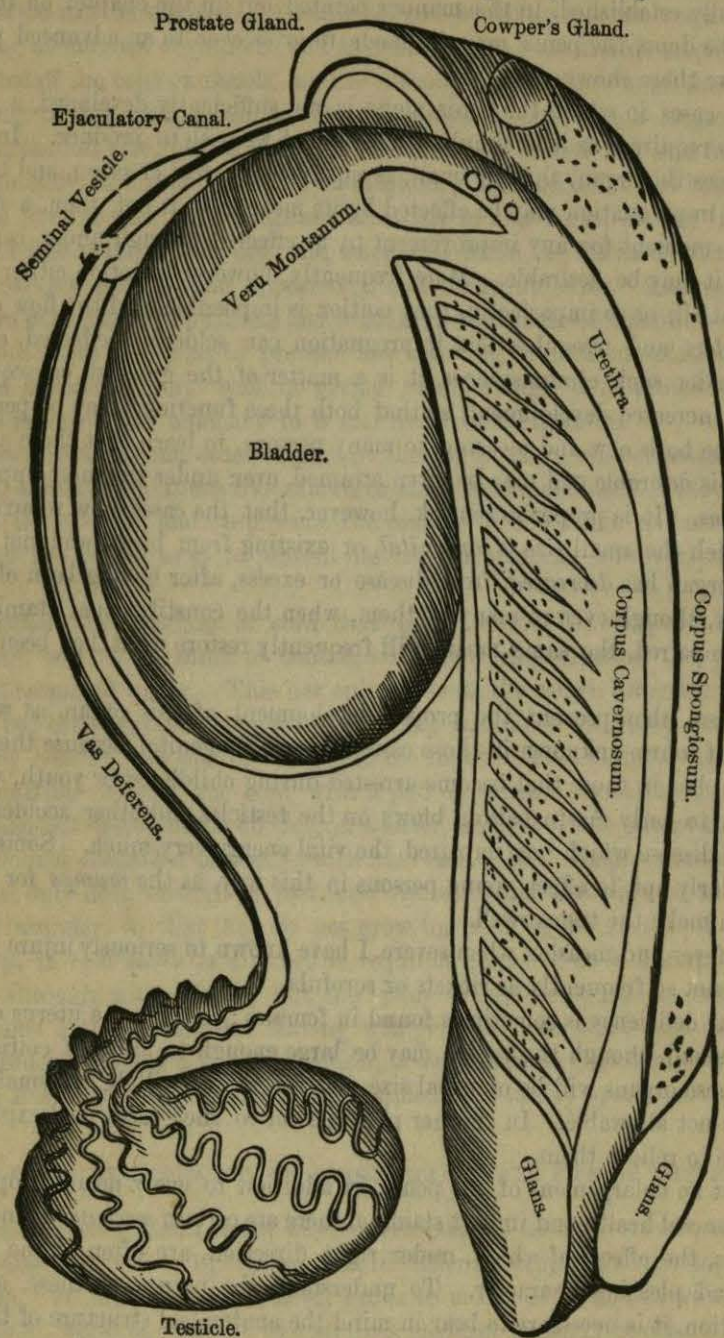


FIGURE 74.—Section of Penis and Bladder.

able to grow nor become erected. In the same way after long-continued excess, or debilitating disease, the artery seems to lose its power of transmitting blood with sufficient vigor, and the cells, from want of being filled, decrease in size, and eventually

grow up more or less, causing the organ to shrink. This is the reason also why absolute suppression of sexual excitement, if continued too long, will make the organ waste away, instead of increasing its power, as many uninformed people suppose.

The object to be accomplished it will be seen is to open these cells, and cause the blood to flow into them, so as gradually to increase their size, and dispose them to fill spontaneously from natural excitement.

In some persons who have always shunned all thoughts of sexual matters, from a notion that they are improper, it is sometimes sufficient merely to encourage such thoughts, to a proper extent, and the excitement this gives rise to in the parts will act favorably on their growth. In others the daily employment of a warm local bath, with brisk rubbing, and the use of a stimulating ointment, will be found still more efficacious; and if this treatment be regularly persisted in, under judicious direction, combined with proper internal remedies, it will succeed in a large number of the cases ordinarily met with. It is requisite, however, that the external and internal stimulants should be exactly apportioned to the wants and capabilities of the individual's system, and that a strict watch should be kept upon the action and effects of each, so as to know when to increase or decrease their power, and when to suspend their action altogether. Until over forty years of age, if the *form* of the organ is perfect, and its development not too small, a considerable change may be effected in this way, though the younger the patient is the more readily the parts are acted upon.

I once had a patient call upon me from Cuba, the son of a rich planter, who was troubled with this imperfection, and who was intensely desirous that it might be remedied so as to allow of marriage. He was about twenty-three years of age, and of a strong, robust habit of body, with excellent health. On examination the penis was found about *two inches and a half* in length, and about as thick as the fore-finger, properly formed, but with little more sensibility than any other part of the body. The testicles were fully developed, and the sexual feeling was quite strong. There had been frequent emissions of semen, under strong excitement, but no *erection*, and consequently no connection could take place. Upon inquiry, I found that he had been brought up to a very rigid code of morals, and had imbibed certain notions about the necessity of not indulging sexual desires if the mind was wished to become powerful: as he was very ambitious of distinction he made a perfect anchorite of himself. The bodily effect of such a course has been seen—its effect on the mind was to make him wayward, irritable and unhappy. A short time before he came on to see me he met with a young lady with whom he fell violently in love, and immediately the desire for marriage arose, but with it came the fear that he was totally incapacitated. The new desire, so strongly awakened, together with the fears he felt, operated so intensely upon him that he became almost insane. On assuring him, however, that there was a reasonable prospect of his attaining a more perfect state, he became calmer, and patiently submitted himself to the prescribed treatment.

The first object was to induce as much heat as possible in the organ, so as to promote the flow of blood to it. This was accomplished by the use of a hot stimulating lotion two or three times a day, followed by brisk rubbing with flannel and soft brushes. In three weeks the effect of this treatment became obvious—erectations occurred, partial at first, but ultimately quite forcible, and the organ evidently began to increase permanently in size. In addition to this he was directed to use some stimulant drops, and to live generously, to impart as much vigor as possible to the

generative organs. The flow of semen soon became much larger than before, under this treatment, and the procreative instinct much more powerful. There was still one fault, however, and that was a want of power in the *muscles* that assist in erection and coition, more especially in the erector penis muscle. This was remedied by frequent *shampooing*, and pressing of their fibers till they acquired volume and firmness, the same as any other muscle would do under similar treatment.

This system was rigidly pursued for six months under my own inspection, at the end of which time the penis was four inches long, when erect, and quite firm, so that coition was possible. At this period he was desirous to return home, and as he was evidently determined to pursue the same treatment himself, I consented to his doing so, though I would have preferred for him to have stayed still longer. I heard from him eleven months after his departure, and he then informed me that the improvement had still continued till he no longer thought it necessary to proceed. He was then intending to marry in about three months. The delight and gratitude of this young man were unbounded, rescued as he was from the very depths of despondency and despair, and raised, as he expressed it, "to the highest pitch of human happiness."

In the course of my practice I have had numerous similar cases, some of them resulting satisfactorily from the same treatment, and others requiring a different plan, which I will now explain.

When the means above described fail to induce a sufficient flow of blood into the erectile tissue, an instrument is employed, called a *congester*. It consists of a tube, the size of which is adapted to the organ, to which is fitted an exhausting air-pump. The penis being introduced into this, the air is more or less exhausted, and the blood of course flows into the contained part immediately. So great is the rush of blood, in fact, that if the exhaustion was continued too far, or made too suddenly, the tissue would burst. In a short time, with care, the part begins to swell and look red, and erection, more or less complete, soon takes place. This *never fails*, unless the vitality of the part be totally gone, or the structure of the tissues completely disorganized. I have seen some of the most remarkable results follow from the use of this instrument that were perhaps ever witnessed, in a medical way. I have known patients in whom the whole organ was not *half an inch long*, and without the slightest tendency to erection, and yet the congester has caused it to grow, and has given it power, until perfectly capable for the purposes it was intended for. Sometimes there only appears a simple protuberance, like a tumor, while at other times the organ is long and surprisingly small, and quite flaccid, but still the congester will impel the blood into the tissues and produce the effect desired. Sometimes, it is true, we cannot gain so much as would be desirable, but nearly always sufficient for Nature's requirements, and very often as perfect in condition as if no imperfection had ever existed.

In conjunction with the congester it is also requisite, in most cases, to act upon the muscles by shampooing, as they are usually deficient in power, and without their action the penis cannot erect, though it may become firmly congested.

This practice of shampooing the perineal and genital muscles, to improve the erectile power, was originated in Asia, but has been known and practiced in Europe for many years. The process is both tedious and somewhat painful, and requires both skill and knowledge in the operation. In Turkey men make a regular business of this, and they succeed admirably. In this country it is necessary to direct the

patient himself, or hired assistants, and the constant supervision of the medical man is therefore required. To perform this operation to advantage, it is best to have the parts made perfectly bare and smooth, and then lubricated with a proper ointment. The operator then presses the end of the forefinger firmly into the muscle, passing it along backward and forward, in the direction of the fibers, till the muscle becomes hot and swells. This is done with all the muscles whose action is required, and it should be practiced every day till the effect is manifest. At first the shampooing causes considerable pain and soreness, but this soon passes away, and then the muscle feels firm to the touch, and is found to be much stronger.

It must be recollected that the various means I have described require a long period to be put fully in operation, and are such as can be commanded only by those who have plenty of both time and money at their disposal.

With those who are fortunately so situated as to have these essential requisites, the gain is certainly great, and well worth what it costs, and I have never known one, who was successfully treated, who did not say he thought no price could be dear to pay. Many a man has been saved from insanity or suicide by these means, and many a domestic hearth has been made the scene of happiness and delight, that was previously the abode of recrimination and despair.

I have treated patients of all ages, from mere youths up to maturity—the oldest I recollect being about *fifty-two*—and in *most of them* with a success that has been as pleasing to them as it was gratifying to myself. Some of the means I have mentioned are scarcely known in this country, and are certainly not put into general practice; the account I have given of them may, therefore, be the means of giving many sufferers the first intimation that help can be had.

One of the most remarkable cases I ever treated was that of a young man of nineteen, who was brought to me by his father, himself a physician. In this person there was scarcely any appearance of a penis, but only a small tumor, not projecting more than a quarter of an inch, in the center of which was the opening of the urethra. It was quite sensitive, however, and seemed rather as if compressed downward. The testes were of average size, and the semen secreted in sufficient quantity, apparently, so that nothing seemed wanting but a perfect penis. I at once told his father that I felt assured much improvement could be obtained, but that it would require much time and attention, with great endurance on the part of the patient himself. They were both delighted to hear this, and the young man testified his desire that I should commence the treatment immediately, which I did. A congester was constructed specially for the case, and applied daily. The lower part was of glass, so that its operation could be seen, and it was observed that immediately the tube was exhausted of air the penis seemed to be drawn forward, and extended to full two inches. The patient complained of great pain in the part during the operation, from the rush of blood into the cells, and it remained exceedingly tender for several days after. The congester was not applied again till this soreness had subsided, but in the meantime the stimulating hot lotions were used, and shampooing of the muscles was practiced. It was observed that even the first application had evidently caused some protrusion, and the young man remarked that the *internal* sensations were different from what he had ever before experienced. The internal medication in his case was of a more stimulating character than ordinary, because the sexual impulse was not very strong, and only occasionally manifested. His diet was directed to be as nourishing as possible, with wine for drink, and every day he rode out on horseback after

a warm bath, followed by brisk rubbing of the whole surface of the body. After the first effect had subsided the congener was used daily, and followed by the shampooing, for ten weeks, by which time a permanent advance had been made. The penis measured full two inches in its ordinary state, and in the congener was extended to three. Partial erections occurred at times during sleep, and the procreative instinct became more active and permanent. I then directed him to return home for three months, and only continue the general treatment, so that I might see if Nature herself could complete the work. At the end of three months he came back to me with a still further improvement, though slight. He was then put under the old treatment again, and this time the effects were still more satisfactory. In two months, under the congener, the penis measured four inches, and in the ordinary state remained permanently at three, with firm erections and copious emissions of semen. Finding, therefore, that every requirement of nature could be fulfilled even as he was, and that further improvement would evidently take place with the growth of the system, I desisted from further treatment and sent him home *cured*. His father was as much astonished as gratified, and another physician who had seen him and pronounced him an *hermaphrodite*, would scarcely believe it was the same being.

Another case was that of a man who had married at thirty-two, though imperfect, from a mistaken idea that marriage would effect a cure. The result may be imagined; the misery of two human beings could scarcely be more complete. In his despair a friend brought him to me for my opinion. On examination I found the penis not very small, nor in any way imperfect, but it had never been *erected*, and seemed incapable of being so. The semen was secreted plentifully enough, and the instinct was as strong as was desirable. I told him without any hesitation that he could be made perfect enough for his marital duties in a short time, providing he would follow strictly my directions, and submit to my treatment, which he was willing enough to do. The congener was applied, and with the happiest results. At the third application a powerful erection was produced that did not subside for a considerable time, owing to want of perfect action in the cavernous veins. This, however, was soon remedied, and in two weeks, by the use of the congener alone, natural erections occurred spontaneously, as perfect as could be desired. In a word, he was perfectly cured, and is now the father of two children.

I have also had numerous instances of persons who had lost the power of erection from sexual and other excesses, from mental anxiety and from the effect of debilitating disease. In a great portion of these the result has also been favorable, though in many all vitality had left the organs before I saw them, and in others the structure was completely disorganized. Many young men especially, victims of masturbation, whose organs had ceased growing, have by these means been rescued from impotency and imperfection. Many a man of mature age also, whose powers were unimpaired, but who could not exercise them, owing to this particular debility, has been restored to his former capability in the same way.

The congener is not an instrument adapted for self-treatment, and I would not advise any one to attempt its use without proper directions and supervision. I have known it to do great mischief with inexperienced people, and fail in accomplishing any good. In one man who had applied it too forcibly and suddenly, the cells were nearly all ruptured, or broken into one another, so that severe inflammation was produced, and the power of erection was forever lost.

There are some means, however, that all persons may use, provided they know

when they are appropriate to the case. The pressing and shampooing may be partially practiced by the patient himself, though very imperfectly, but the general directions as to diet and exercise may be observed of course by all. Perhaps, however, there is no other functional disability so difficult to treat, or that requires so much skill and such unremitting attention.

In addition to the means already described, there are some others occasionally useful, but which are not so generally applicable. *Galvanism* is sometimes an excellent agent, when there is *nervous* insensibility combined with the other disabilities. A very good mode to use it is to galvanize the metallic congener, while the organ is engaged within it. The power must not be too great, however, nor the application continued too long, or there may be partial paralysis.

The French have a practice of *flagellation*, which is sometimes very efficacious, and will induce erection in a short time. It is rather severe, however, and few have courage or endurance sufficient to continue it long enough to derive full benefit. The *flagellator* is made of six or eight small twisted thongs, about as thick as a violin string, but very flexible, and about eight inches long. To operate with it to the best advantage the parts should be made bare, and perfectly smooth, and the flagellator must then be applied the whole length of the penis, and on the pubes, perineum, and inside of the thighs, till the flesh is quite red and smarts. The flogging must never be so hard, or long continued, as to make any bruises, nor leave any soreness, but merely sufficient to make it red and feel hot, with slight smarting. Usually about a quarter of an hour is sufficient every day. After the flagellation the parts should be well bathed in hot water, and the patient should recline.

This treatment may seem singular to those who never heard of it before, but it is undoubtedly more efficacious, in numerous cases, than any one could well believe who had not seen it practiced. I have known many patients resort to it, with the happiest results, who could not stay with me long enough for the usual treatment. In some it will produce powerful erections the first time, and lead to an influx of blood to the parts that soon stimulates their growth.

*Firing* is another practice that may be resorted to, if others fail, for rousing the dormant energies of these parts, or causing growth. It consists in *burning* the parts with a smooth iron button, made hot by plunging it in boiling water. The parts are first made smooth, and then the button is taken out of the water and pressed suddenly on, repeating it as fast as possible, till the whole length of the organ has been operated upon. No part should be touched twice, nor should the iron remain on more than an instant. The pain is very slight, and no blister is raised, the places only turning *white* at first, and afterward remaining red. The firings should be repeated only at intervals of three or four days, waiting till the effects of one are gone off before another is practiced.

This process is sometimes astonishingly effective, a single application producing such a powerful effect that no further treatment is required. Care is required, however, not to produce too much inflammation, nor to operate too near the testes. Sometimes the development will be much less on one side of the penis than the other, or less in the corpus spongiosum than the cavernosum, so that the organ will not be straight but curved; or it may be straight in the ordinary state, but not capable of erecting in all parts alike. This state of permanent chordee is perhaps better treated by the flagellation or firing than by any other means, because they can be applied locally, and only to the affected part.

It may perhaps be as well to remark here that a modification of the congester is sometimes of great service in certain torpid states of the female organs, and that some of the other treatment is also occasionally applied to them, in a modified form, with the happiest results.

The penis is, perhaps, more variable in its form and situation, among the different mammiferous animals, than any other organ. It is only among the bats and apes that it hangs down from the pubic bone, like it does in man, being in the others always included in a sheath. In the cat, the rat, and some other animals, it is directed *backwards*, and in the beaver it is drawn far back into a kind of canal, like a vagina, while in the kangaroo it is even surrounded by the sphincter muscle of the anus. In many animals the prepuce is very long and like a sheath, and the penis is ordinarily drawn into it, when not erect, as in many of those above mentioned, and as we see in the horse; but sometimes the penis is permanently so long that it cannot be drawn into the sheath in a straight form, but has to be bent.

The position of the penis is variable in different animals, according to the mode of their copulation. In man, apes and bats it is covered by a sheath of the common skin of the body, which grows fast to it, except on the glans at the end, and hangs free from the bottom of the abdomen, being supported by two special ligaments. Underneath, as far back as its root, it is confined under the skin, nearly to the anus. In carnivorous animals, pachyderms, ruminants, horses and amphibia, the sheath does not grow fast to the penis, and is confined to the body as far as the navel, the naked penis being protruded from it only during erection, or while urinating. The substance of the under part of the sheath is quite firm, to enable it to sustain the weight of the penis, which is often considerable. In the elephant the weight is so great that a solid ligament is needed underneath.

The opening of the sheath, in the above cases, is usually near the navel, and it is often not so long as the organ it has to contain, in which case the penis has to bend, or fold itself when drawn within. In the elephant it is very long, and to bring it fairly under cover of the sheath, it has to be bent like a double letter S. In the camel, dromedary and cats it is bent back, so that it points behind, which explains why the males of these animals urinate backward. It is only during erection, when it is unbent, that they point the penis forward.

In the agouti and the marmot, the penis after being pushed out of the end of the sheath, is bent back under the skin, till it reaches just under the anus. In some others, as the rats, hares and opossums, it is carried back, in the same way as above, and issues nearly from the anus itself.

The form of the penis varies as much as its size. It is of small diameter in the boar, and in cattle, and usually tapering, while in the horse and elephant, it is large, of equal size in all its length, and flat at the end. In the rhinoceros it is large and conical; in the dolphin it is large, conical, and flat. In the gnawing animals, and quadrumana, it is cylindrical, and in the rat it is shaped like a letter S.

The structure is similar, and erection is caused in the same way in all cases, by the blood filling up the vessels of the corpus cavernosum, as water fills a sponge. In the elephant it would take at least a gallon of blood to cause a perfect erection.

In those species the females of which have a double vagina, like the kangaroo, the penis is also double, so that there is one for each passage, each having a tube to convey semen, though there is but one urethra for the urine, which opens between the two glans. The alligator also has a double-headed penis. The glans

on the end of the penis is even more variable than any other part, being seldom soft and spongy, as in man, but frequently hard, horny, and covered with sharp points, and sometimes even it scarcely exists in any form. In some of the apes it is spread out like a mushroom, with slit edges, and occasionally covered with sharp, hard spines. This is the case also in the bat, and partly so in the shrew-mouse, while in the hedgehog it is divided into three lobes. The hyena has it formed like the broad knob of a door, and in the bear and dog it is like a long club. The glans of the cat is covered with horny spines directed backward, which probably cause pain to the female, and draw forth those horrible cries which these animals emit during copulation. In the Guinea pig it is covered with scales, and has two horny *hooks*, while in the hare it is drawn out to one long, thin point, and in some other animals into two points. In some it is even covered with stiff hairs, and in many has rough knobs, or tubercles. In the rhinoceros the glans is *bell-shaped*, in the horse it is bulbous, and in some of the whales it is shaped like a tongue, while in others it is conical. The most singular form, however, is in that curious animal, the *ornithorynchus*, in which it is very large, square, divided in two parts, and covered all over with spines. The *bone* of the penis is found in many animals, as well as in the Negro occasionally. It is very large in the dog, but small and thin in the cat, while in the raccoon, and rat, it is crooked, like the letter S, and in some others it is formed like a hook. In the squirrel its termination is flattened out, like a shovel.

It is found in all the quadrumana, gnawing animals, seals, and whales, and also in all the digitigrades (animals that walk on their toes, instead of the flat of the foot), except the hyena. In the bears, rats, and dogs, it forms the greater part of the organ. In cats, the ichneumon, and some of the rodents, it is small, while in the whale it is quite large, reaching nearly to the end of the penis, and terminating like a club.

The testicles having been already fully described, the whole male generative apparatus can now be fully understood, both as regards its own specific action, and its conjunction with the female organs in the act of sexual conjugation.

Many other particulars as to these parts will be given when we come to describe their diseases and malformations, and when explaining foetal growth and child-birth.

In regard to the position of the testicles, we find three different classes. In one class they are always within the body, in another they are always without, and in the third they only descend at the period of pairing, being at other times within the body. I have even known men in whom the testicles descended into the scrotum only when they were sexually excited, they being at other times in the abdomen.

The animals that carry the testicles externally, do so in a proper pouch, called the scrotum, which is placed differently in different animals. Apes and carnivorous animals carry the scrotum behind, under the anus, and both testicles lie in it together, with nothing between them. In the kangaroo, the hare, the jerboa, most of the ruminants and the solipedes, such as the horse and ass, the scrotum is divided into two distinct parts, so that the testicles are completely separated from each other by a partition.

In the moles, rats, beavers, squirrels and many others, the testicles descend into the scrotum only at the time of the rut, and when that is over ascend into the abdomen again. In the civet-cat, and in many pachyderms, or thick-skinned animals, like the

hog, which have no true scrotum, the testicles are still always outside. They lie in the thickness of the perineum, just below the anus. The camel carries them in the skin of the groins.

The ornithorhynchus, seal, whale, elephant, and many others of the pachyderms, carry the testicles always inside, where they are attached to the loins, much as in birds.

The seminal vesicles, as before explained, probably act as reservoirs, in which surplus semen is stored between periods of copulation. They are not always present, some animals being quite destitute of them. Like the testicles themselves, they are often quite small, except at the time of the rut, and they vary greatly in form and size. In some animals their walls seem to be glandular, which makes it probable that they also secrete some fluid to mix with the semen, or else they in some way modify that fluid.

The prostate gland undoubtedly secretes a fluid which mingles with the semen, and is probably essential to it. This gland exists in all the quadrumana, bears and rats. It is double in the ruminants, and in the bats is so large that it surrounds the whole urethra, like a ring. In cats and dogs it is very large, making quite a projection. The elephant has four prostates, two on each side, of unequal size, and they are placed inside the seminal vesicles. Horses also have four prostates, but they are differently disposed.

Cowper's glands, usually considered as a small prostate, are very small in men, but in some animals are quite large; they probably secrete some necessary addition to the semen, like the prostate itself. They are much larger in apes than in men, and still more so, proportionately, in bats and cats. They are largest in the hyena. The pouched animals (marsupials) have several of these glands, sometimes as many as six. In the squirrel and marmot there are two, resembling bladders. In the boar they form a long tube, while in the elephant they are round and flat, and quite large.

A want of careful observation has led some anatomists to confound Cowper's glands with the seminal vesicles, but they are always distinct enough, both in structure and function. The vesicles contain semen, but these glands contain a peculiar fluid of their own, very different.

The glans at the end of the penis varies in form and structure as much as any other part, being in all cases adapted to the part of the female it has to reach in the act of copulation. This is necessary, because it is the part which causes in her the proper degree of excitement.

#### GENERATIVE ORGANS OF THE MARSUPIALS.

Our previous explanations have shown that there are two very distinct kinds of animals, among those with which we are ordinarily acquainted, namely, those that bring forth eggs only, which are developed externally, and those which develop the eggs in their bodies, and bring forth their young alive. The females of these latter all possess a peculiar organ called the matrix, or womb, in which the new being remains connected with the mother, and is nourished by her blood, till it is enough developed to live alone, then it is born and she further nourishes it with her milk. The womb, therefore, is the distinguishing organ among females of this kind, and there is nothing like it in those that bring forth eggs only.

There is, however, a class of animals, found mostly in Australia, which are inter-

mediate between these two. They are called marsupials, or pouched animals. The kangaroo is typical of the marsupials. The females of this class bring forth their young alive, and have a womb in which it is formed, but it is very imperfect, and so is the connection between mother and child, so that the offspring is not retained in the womb till it is perfect, as in the true viviparous animals. It is brought forth half formed, like an early miscarriage in more perfect beings, and is then placed in the pouch, or pocket, which is under the belly, outside. In this pouch are the teats, or external openings of the milk ducts, and each little half-formed being, as it passes out of the womb, is attached to one of these teats, and enclosed snugly in the pouch, where it remains till its development is sufficiently advanced for it to live alone.

It will be seen from this that the marsupials are intermediate between the oviparous and viviparous animals. They bring forth the young alive, but only half formed, and complete the development in a sort of extra external womb—the marsupium, or pouch.

All these animals are peculiar in many ways, some of them very much so, and they are in every way of an inferior type to the true viviparæ. The brain, in the kangaroo, is very imperfect, so that the animal has but little intelligence, not even enough to recognize its keeper and feeder. The hind legs, also, are the only limbs perfectly developed, the front ones being very small, and useless for progression. The animal, therefore, uses its tail, which is enormously developed, and with this and the two large hind legs bounds along by successive leaps. It also possesses certain peculiar bones, called the marsupial bones, because they are found only in marsupial animals. These bones are placed under the abdomen and serve to support the pouch, and the young, in the female, and are important also to the male, in connection with the generative apparatus.

The sexual organs, and the process of generation altogether, in these beings, are very peculiar, as will be shown further on.

In all of them the uterus is double, and the vagina is also divided more or less completely into two distinct canals. The generative tubes and the digestive both terminate in a common *cloaca*, as in birds, thus showing an approach to the ovipara. In the male the penis is double, or divided, corresponding to the double vagina of the female, and in all probability the act of copulation is double.

The American opossum is a marsupial, but has not all the peculiarities of the class so prominent as in the kangaroo. The young, when born, are blind and shapeless, and do not weigh more than a grain each when they are placed in the pouch. There are often from ten to sixteen of them. When perfect they leave the pouch, but often run back to it for shelter, when there is danger, as indeed all young marsupials do. The way in which the young opossums travel when older is very droll to witness. The mother curls her long tail over her back, on which the young ones stand, and each one keeps his place by curling his tail round the mother's, and so they travel.

There are many different kinds of these animals in America, especially in the south, some of them very small, like mice, and until Australia was explored they were thought to be the only ones of the kind in existence.

There are many fossil marsupials, and, in fact, it would seem that at one period they were a prevailing type. Some naturalists have suggested that Australia, which is peculiar in many respects, is in reality a fraction of the world of that period.

The mouth of the young marsupial, and the teat of the mother, are so formed