

not be employed. Should the accident happen to me, I should pass a fine needle through the frænum, armed with a fine cat-gut suture, and tying it tight, cut off the ends close. Such a practice would be far preferable to styptics, and certainly should be preferred to ligation of the lingual.

The tongue has fallen back into the fauces, closing the glottis and posterior nares, and greatly endangered life. This is due not so much to extensive injury to the frænum as to section of the muscles. By exercising some caution in making the section, and ascertaining that nothing but the mucous membrane is engaged between the points of the scissors, such an accident should never occur. It must always be an evidence of bad surgery. It might be remedied by passing a ligature through the tip of the tongue, and attaching it to adhesive strips on the chin. Possibly in some instances, it would be practicable to unite the edges of the incision by a fine suture. In either case, the ligature or suture should be retained until the wound has united.

*Tetanus* may follow the operation in the case of very sensitive children, particularly if the operation has been bunglingly performed, and the incision made by a succession of snips with the scissors, rather than a single decided cut. The treatment will be as usual in that condition.

Ordinarily there will be little pain, the child nursing with avidity immediately after the operation, but *Hypericum* had better be given for a day or two.

The condition is not as frequent as our text-books would lead one to suppose, at least as far as my experience goes; the cases occurring in my practice not having exceeded half a dozen.

## PART EIGHTEENTH.

### CATHETERISM.

Catheterism is the operation for evacuating urine from the bladder, in cases in which, from any cause, it is incapable of evacuating itself. The term is also applied for want of a better one—to operations for the injection of fluid or air, into some of the visceral cavities, through the medium of a hollow tube. Thus the eustachian tube, under some circumstances, requires dilatation, and a catheter made for the purpose is employed. In some conditions the bladder will require, or is thought to require washing out, either with medicated solutions or chemical agents, and a special form of catheter is used for the purpose. At this time, however, we have only to consider catheterism as applied to the bladder, that of the eustachian tube coming more properly under the consideration of special practitioners. Even as confined to the bladder, the operation is one of some importance, and very frequently will be found of exceeding delicacy, requiring accurate anatomical knowledge, and very considerable manual skill and dexterity. So frequently is this the case, that the subject had better be reserved for consideration under major surgery, but inasmuch as the general practitioner will be frequently obliged to resort to it, it will receive attention at this time, and with somewhat greater minuteness than has been bestowed upon other topics in this volume.

We will first consider the instrument used in the opera-

tion. The catheter is a cylindrical instrument, varying in length from four to ten inches, as it is designed for women, young people, or adult men. In diameter, from the size of a quarter of an inch to a mere thread. In general form, they are curved at the tip, the curve according to Mr. BRIGGS, of London, "corresponds to rather less than one-third of the circumference of a circle three inches and a quarter in diameter." The curve, however, varies somewhat; in young persons it is shorter; in the fleshy somewhat increased; in those who suffer from prostatic hypertrophy, the curve must be extreme and shorter, or much lengthened, the instrument almost straight. In different conditions, also, such as various forms of stricture of the urethra—the degree of the curve is varied, each case, almost, requiring especial consideration. Catheters are spoken of as of various sizes, according to the annexed

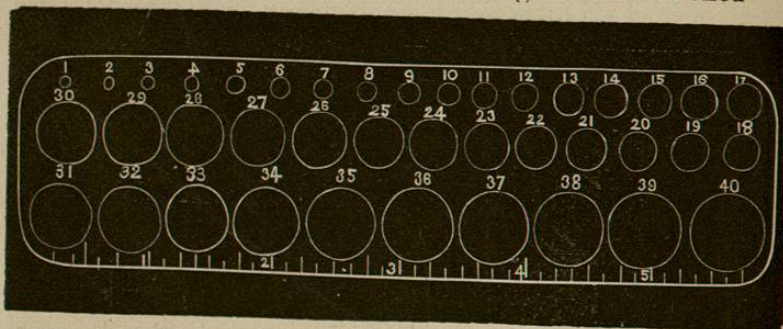


FIG. 81.

scale, from 0 up to 14 or more. For ordinary use, No. 6 or 8 is undoubtedly the most useful. The usual forms of catheter are as in the cut (82), the end entering the bladder being perforated with a fenestra on each side, and called the *beak*. The opposite extremity is called the handle, and has a ring attached to each side, both for the purpose of attaching tapes when it is desired to retain it in the bladder, and to

indicate the direction the beak is moving in, when entered in tortuous canals.

The material from which catheters are made is not constant; some are made of metal; others of some soft yield-

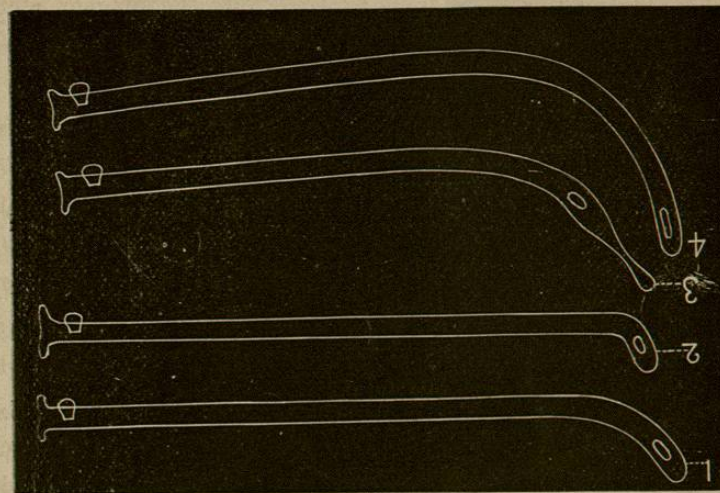


FIG. 82.

ing material, as gutta percha. When of metal German silver, silver, or baser metals electroplated (gilt or silver), are used. For the general practitioner, a convenient size and form is a No. 6 silver instrument, in three parts, fitting into each other by a screw-joint, so that little space is required in which to carry it, and instruments for both male and female are always at hand (Fig. 83). No. 1 in the figure, when attached to No. 3, forming the female instrument, and No. 2 the male. The joints must be perfect fitting, and when joined the rings in the handle should be quite accurately at right angles to the long axis of the cylinder. Catheters of gutta percha are generally provided with a wire stylet, which serves to keep them stiff, if desired, when used, or alters the curve of the tip by partially withdrawing it. They are made like the metal instruments, of all sizes,

always for use in the male, however, and olive-pointed, conical, or rounded as occasion or fancy may dictate.

There are many forms of catheters that different makers or surgeons have invented from time to time, but the surgeon who cannot introduce the ordinary instrument, of suitable size and varying curve, cannot do much better with any patent affair. We have jointed catheters, made of a number of segments strung on a wire, which I think should never be used. It is not seldom that the wire has broken, and some of the segments left in the bladder or urethra. So also there are a number of instruments provided with some kind of flange or spring attachment, designed to keep the catheter in the bladder when it is desired to retain it. *All* of them had better be left on the instrument-makers hands; they are all more or less hurtful or inefficacious.

For purposes of injection, or to wash out the bladder, the double catheter is very useful, and is indeed often indispensable. It can be procured of any calibre above 5, I believe, and will be more generally useful if about No. 8. Other special forms that are required in exceptional cases, will be considered later, as well as in

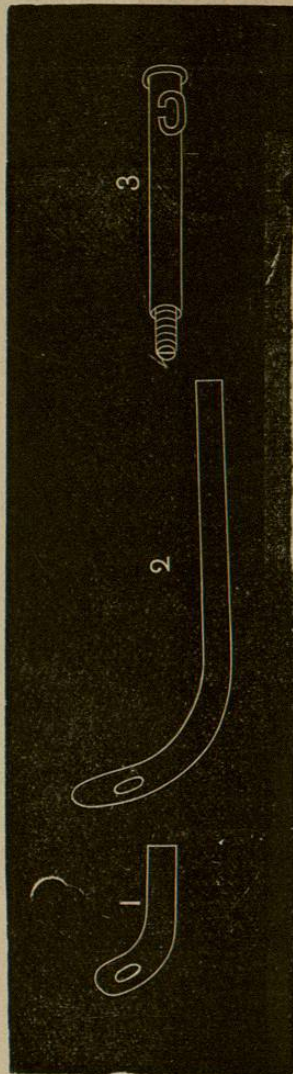


FIG. 83.

the appropriate chapters in *Emergencies and Operations*. Before giving the procedures for the introduction of the

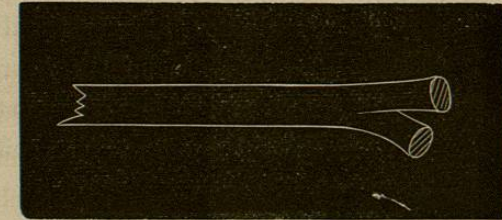


FIG. 84.

catheter, it is necessary to give some attention to the anatomy of the urethra, at least sufficient to lead to an intelligent comprehension of the difficulties that may be encountered, and to suggest measures to overcome them. The male urethra is simply a prolongation of the urinary bladder, (1) and is divided, from behind forwards into three portions which are important landmarks in urethral surgery. In its passage forwards the urethra passes through the deep perineal fascia. The *first part* is known as the *prostatic portion* (4) and is the widest and most dilatable portion of the canal. It passes through the prostate gland, and terminates at the point of exit through the perineal fascia. It is perforated by numerous small orifices, the ducts of the glands, and the central floor is marked by a ridge (2), an elevation of the mucous lining, called the *veru montanum*, (or *capet gallinaginis*), which is pro-

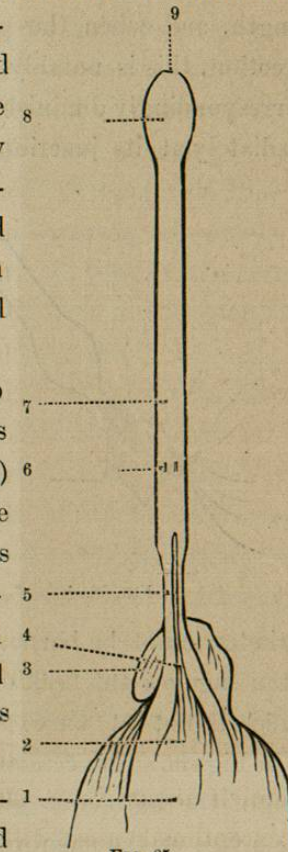


FIG. 85.

longed into the membranous portion. In the middle of the floor there is a depression, the sinus peculiaris, in which are found the orifices of the ejaculatory ducts. It will be observed that all of these openings are on the floor of the canal, indicating that the beak of the catheter must rather incline to the upper surface of the canal to avoid them. Particularly is this true of the sinus.

The second portion of the urethra, (5) is known as the *membranous portion*, and is the most constricted of the three. The *veru montanum* extends into this, for its whole length, and when the penis is engorged, or in a state of erection, this is notably enlarged; the calibre, therefore, is correspondingly diminished under those circumstances. Immediately at its junction with the third part of the canal,

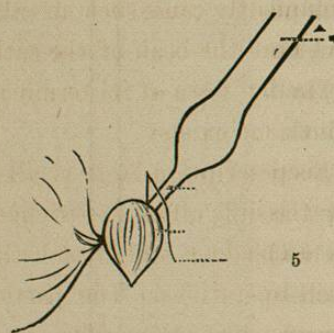


FIG. 78.

we find a remarkable enlargement, called the bulb (Fig. 86), which extends backwards, under the membranous portion for quite half or one-third of its length. This portion of the urethra derives surgical interest from the fact that it is the usual seat of stricture; is extremely sensitive, so that the catheter cannot be borne, at times; that the perineal fascia often engages the beak of the catheter so that the prostatic orifice is not at once found. The fascia is indicated at 5, in Fig. 86. It occasionally happens, also, that the dilatation of the bulb is so great, that a *cul-de-sac* forms around the orifice of the membranous portion, and the difficulties of catheterization are greatly increased.

The last division of the urethra, known as the *spongy portion* (7, Fig. 85), extends from the membranous portion to the *meatus* (9), and is the least distensible of the three. The points of interest are, first the orifices of the ducts of *Cowper's gland* (6), at the bulbous portion; and second, the considerable dilatation at the anterior extremity (8) known as the *fossa navicularis*, which presents a constriction at the inlet and the outlet. This constriction, particularly with the employment of an olive-shaped catheter beak, might lead to a suspicion of stricture, unless the student is prepared for it by previous knowledge. As a matter of fact, stricture of the urethra usually occurs at one of these points, viz., the entrance to this fossa, or at one extremity of the membranous portion. The existence of such an impediment, however, cannot be told by the novice unless it is very tight. Morbid action will frequently cause such an enlargement of the bulbous portion, that the beak of the catheter is almost inevitably engaged in the fossa at its termination, and a stricture suspected when none exists.

Imperfect and cursory as this description is, it is all that will be needed to point out the difficulties experienced in introducing instruments into the bladder, and must be borne in mind when attempting such operations. The particular points of interest, from before backwards may be arranged in the following order: the *cul-de-sac*, at the base of the bulb, greater on the floor of the canal; the perforation of the perineal fascia by the membranous portion; the orifice of nearly, if not all of the glands and ducts opening into the urethra found on the floor of the canal.

*Introduction* of the catheter may be performed sitting, standing, or lying, with decided preference for the latter. In the case of persons of adult age, an instrument is selected

of calibre sufficient to fill the canal, it being safer, as far as entrance to the bladder is concerned, to use an instrument larger than is necessary, rather than one too small. By this means the folds or *rugæ* are smoothed, and the beak is less liable to become engaged in false passages, in the numerous fossa, or in the orifices of enlarged ducts. Impressing our minds fully with the fact that the utmost gentleness and tact are to be employed, and that address and scientific knowledge are to take the place of mere force, the operator is in little danger of forcing his instrument through the mucous surfaces, and make false passages.

First warm and lubricate the catheter with oil or soap, and see that the margins of the fenestræ, or the joints, if there be any—are smooth and rounded. Sitting facing the patient, on his left side—take the glans penis between the thumb and finger of the left hand, raising the organ vertically, or slightly drawn upwards on the abdomen; introduce the beak of the catheter into the meatus, holding the instrument with the concavity directed toward the abdomen, and by a gentle motion press it in, onwards towards the bladder. Upon reaching the bulbous portion, slightly depress the handle towards the thighs, and cause the beak to hug the upper surface of the canal. A slight sensation will be communicated, on the passage of this point, to the hand. When the perineal fascia has been reached, depress the handle still more, and if the beak does not pass into the prostatic portion readily, do not force it. Withdraw the instrument very slightly, and by further depression of the handle, and slight changes in the direction of the beak, the passage will soon be found, and the mere weight of the instrument will usually carry it the rest of the way into the bladder. When the prostatic portion has been reached, apply the forefinger to

the open end of the catheter, to guard against the emission of the urine until ready with a vessel for its reception and bring the head of the instrument down between the thighs, which is a position it will assume without assistance from the surgeon.

When the bladder is empty, withdraw the catheter gently describing a curve with the hand over the left groin.

*In the female* the operation is simpler, in one sense, inasmuch as the urethra is short, and is not so complicated in structure. Having found the meatus, and entered the catheter there is no further difficulty, the slightest pressure carrying the instrument into the bladder. The great difficulty is to find the meatus; this is at all times somewhat puzzling to the novice, but when retention of urine after parturition calls for catheterization, the swelling of the parts increases the perplexities ten-fold.

In this operation the patient always assumes the recumbent posture, and is to be covered with a sheet, or the bed-clothing, so that no exposure of the person, even of the lower extremities is made. She should lie on the back, close to the right side of the bed, if possible, the knees separated and drawn up. The tip of the forefinger of the left hand, is to be introduced between the labia, and placed at the upper edge of the vaginal outlet. The catheter, well oiled and warmed—is then introduced by sliding the beak along the upper surface of the forefinger of the left hand, the point directed upwards, and will usually slip readily into the meatus. If this fails, the left hand is passed over the right thigh, and the forefinger, nail downwards—rests on the vestibule, immediately beneath the glans of the clitoris, which is slightly pressed upwards. The catheter is then introduced, using the nail of the left forefinger as a guide—and will rarely fail to enter

the meatus. When the bladder is reached, the outlet of the catheter must be closed with the finger until a vessel is ready for the reception of the urine. The operator must keep a firm hold on the catheter, as there is a tendency, in many cases, to have it retracted into the bladder.

There are unquestionably cases, in which the extreme swelling and tumefaction of the parts, or the existence of some morbid action or anomaly, in which it is impossible to find the meatus in either manner indicated above. After patient and repeated effort, if this cannot be accomplished, the parts must be uncovered, and the operation completed by the aid of vision. This must, however, be seldom necessary, and should never be insisted on except upon conviction of its positive necessity.

It is sometimes necessary, only in the case of men—to keep a catheter in the bladder, more particularly when it has been introduced with some difficulty, and it is deemed inexpedient to renew the irritation always produced by such manipulations frequently. There are very many methods for securing the instrument, all more or less useful in appropriate cases, but either of the following will usually answer every purpose. The method of Gross (*Syst. of Surg.* II, p. 748) seems to be the least objectionable of the two, and is described as follows: "The one which I usually prefer is the double T bandage, the thigh pieces of which are fastened in front and behind in such a manner as not to interfere with the anus or scrotum. The instrument is secured by two strips of linen tape, or oiled silk, by tying the middle of each to the rings of the catheter, and the ends to the vertical bands." In my experience the rings of the catheter have a tendency to irritate the glans, and some fine cotton had better be inserted beneath them.

Another method, is to encircle the penis with a few turns of a roller, or one or two thicknesses of oiled silk, immediately behind the corona, and attach tapes from it to the catheter rings. Whilst either of these methods are perhaps the best of any that seems possible, there is no question that they only partially and imperfectly fulfill the indications. Bodily movements of the patient, will make the traction too great or too little, and the presence of the catheter has a tendency to excite erections of the penis, which makes painful traction on the tapes. The occasion can seldom arise for such precedures, and our daily increasing knowledge of therapeutics will have the effect to correspondingly diminish the necessity.

One of the most frequent embarrassments in retention of a catheter in the bladder, is the tendency to the deposit of urinary salts on the beak, chiefly phosphates—and much annoy the surgeon upon attempting its withdrawal. When the salts are uric acid, which is very rarely the case, or oxalic, which is still more rare,—it is impossible to withdraw the instrument without inflicting more or less injury on the lining membrane. The result will often be stricture, from cicatricial contraction, even in spite of the utmost care to prevent it. When the salts are phosphates, however, they will usually be so soft that no difficulty will be experienced, although there are instances when their consistency is quite dense. In all cases, however, the fragments breaking off on attempts at reduction, are capable of forming a nucleus for vesical stone, and there are a few such cases on record.

Finally, it remains to be considered, the method of introducing the male catheter when some abnormality exists in the urethra, either as to form and capacity, or sensitiveness.

The existence of *stricture* in the urethra occasionally re-

requires a degree of skill and knowledge that cannot be imparted at this stage of our studies; the subject must be deferred for further consideration. In cases, however, in which the condition is readily made out, if a small sized catheter will not pass, it is best to make the attempt with the flexible gum-elastic instrument, particularly one with a conical beak (vide Fig. 82. 3). The young surgeon should never persist in cases of difficulty, at least without the presence and counsel of some more experienced colleague. Irretrievable injury may be done by making false passages, by forcing the instrument through the urethral walls. It is possible, also, in exceptional cases, to engage small instruments in the duct orifices, and thus inflict great injury. The accurate diagnosis of stricture can only be made by means of proper instruments (for which consult *Surgical Operations*). In all cases of doubt, therefore, or of unusual difficulty, the best interests of surgeon and patient will be secured, by seeking competent counsel.

In other cases, there may be prostatic hypertrophy, and the ordinary instruments cannot be inserted. In such cases the instrument shown at No. 1, (Fig. 82), will be the most frequently useful, but a perfectly straight catheter will sometimes succeed better. The manipulations are the same, as when other instruments are used, excepting that the horizontal position of the catheter is assumed as soon as the membranous portion is reached.

Many other difficulties will be met in surgical practice, but their consideration must be deferred for the present.

In some cases, particularly in masturbators, the urethra will be found exquisitely sensitive, throughout its whole course, but particularly in the membranous portion. In some countries, like Switzerland, where masturbation is very

common owing to the solitary life the goatherds lead, the usual sensations of orgasm are soon lost, and sticks and foreign substances are pushed into the urethra to excite the lost thrill. Here we would not expect to find the sensitiveness referred to; in this country, in the city particularly, such extreme practices are rare, and the sensitiveness is quite common. People of a highly nervous organization, particularly students and broken-down business men often present the same peculiarity. I mention this that the impression may not be conceived that such hyperæsthesia is indicative of masturbation; it is a symptom of value only when taken in connection with others. Cases have occurred in which fainting, spasms, or even death has followed the introduction of a catheter that met with no unusual impediment. A spasmodic stricture of the urethra is a common effect, and is detected by the difficulty felt in withdrawing the instrument, it seeming to be grasped and held by a living creature. In such cases the extraction should be effected with great gentleness, and occasionally pressing the glans back with some force will at once relax the constriction. In the absence of particular indications for other remedies, *Bellad.*, will usually relieve this sensitiveness. When it is extreme, however, and instruments of all sizes are alike provocative of suffering, unless the case is one of great urgency, the attempt should not be persisted in. *Bellad.*, will usually allay it; a weak primary electro-galvanic current will often do so promptly; but with no urgency, a daily partial introduction, each day continuing the effort a little longer, and going deeper at each sitting, will be a proper course to pursue, but not to the exclusion of other measures as given above.

In closing I will remark, to add force to what is sufficiently apparent, that metallic catheters are the standard instruments.

The flexible instruments, while used extensively by men of reputation and authority, I have always used and considered as exceptionally indicated. When a catheter is to be retained in the bladder, it should always be a metallic one; the flexible articles being readily softened, and hence as inefficient as they may sometimes be pernicious.

## PART NINETEENTH.

### INJECTIONS.

For purposes of cleanliness, to remove impacted excrement, or to open canals or cavities partially closed by excessive secretions, it is sometimes necessary to direct a stream of water, or other fluids, into such passages, by means of syringes of various shapes and patterns. The operations are, for the most part, very simple, and some of them are daily performed in domestic emergencies without the aid or counsel of the family medical attendant. Nevertheless there are many instances when the mother is unfamiliar with enemata, as injections into the rectum are otherwise called—and it is important that the physician should be able to properly instruct, both by precept and example. In other cases, it would be improper to commit the operation to laymen, it requiring some skill and anatomical knowledge.

1. *Injections of the lachrymal canal*, should not, as a rule, be attempted by the general practitioner, unless his remoteness from cities, or a special practitioner, renders it an absolute necessity. It is made for the purpose of opening the passage where it is filled up by the inspissated or the altered lachrymal secretion. The instrument needed is known as ANELS' Syringe, and is usually provided with two or three nozzles, straight and curved, and of different sizes. The lower lid is put upon the stretch, in the case of the left eye, the surgeon standing behind the patient—and putting the left arm around the head, drawing the lid outward by