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CLINICAL NOTES

ON

UTERINE SURGERY.

WITH SPECIAL REFERENCE TO THE

MANAGEMENT OF THE STERILE CONDITION.

By J. MARION SIMS, A.B., M.D.

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TO

SIR JOSEPH F. OLLIFFE, M.D.,

(UNIV. PARIS),

FELLOW OF THE ROYAL COLLEGE OF PHYSICIANS (LOND.); PHYSICIAN TO HER MAJESTY'S EMBASSY AT PARIS; OFFICER OF THE LEGION OF HONOUR, ETC. ETC.

My Dear Sir Joseph,

When I came to Europe, now more than three years ago, I had no idea of remaining here permanently. But I found in you a warm and generous friend, whose wise counsels and noble liberality elevated me at once into a most favorable position. It was principally through your influence that I was able to reach the highest circles of practice. Without you my sojourn here would have been temporary and fruitless.

Let me assure you, my dear Sir Joseph, that it is not only to you, as a learned and accomplished Physician, whose great talents and attainments have placed him so deservedly in the foremost ranks of his Profession; but it is also to you as a true man of noble impulses and generous nature; it is to you as a Friend, when I most needed a cheering comforting word, that I now come with this Volume, and beg you to accept it simply as a token of Gratitude for the many acts of kindness and friendship which you have so lavishly bestowed upon me.

J. MARION SIMS.

PREFACE.

In 1862, I voluntarily left my own country, on account of its political troubles. Our unfortunate civil war continued much longer than any of us, North or South, anticipated. In consequence of this my residence abroad was prolonged far beyond my original intention. I therefore had time to look over my note-books, and to cull such facts as illustrate the method of treating Uterine Disease at the Woman's Hospital. These facts are strung together in the form of these "Notes."

Having an innate horror of writing, I have not tried to make a book; on the contrary, I have simply related in detail my various operations, and given the history of cases in which circumstances led me to adopt a modified procedure, or for which I have devised new forms of instruments.

A clinical report of this sort very naturally divides itself into groups of cases which may be made illustrative of the principles of practice.

In my own country my contributions have generally been received with kindness; and although I have reason to hope that they will have a friendly reception here, still, as I make no literary pretensions, it is with the greatest diffidence that I appear as an author on this side of the Atlantic.

As its title indicates, this collection of "Clinical Notes" lays no claim whatever to the character of a systematic work. It is simply a voice from the Woman's Hospital, which, in all

probability, would never have been heard if I had remained at home. I wish most sincerely that I could have produced something more worthy of the position so long held by me in that noble Charity; for to this I owe all that I know practically of the subjects herein treated.

In looking over this volume, it would seem that I owe an apology to, and must claim the indulgence of, my brethren for three things:—

1st. A clinical review of personal experience, taken from note-books, as this has been, must almost of necessity be written in the first person.

2nd. It may be necessary to excuse to my senior readers the minuteness of detail in which I have sometimes indulged; but, at the same time, I must plead the necessity of such minuteness for the guidance of my younger brethren, for whom principally these pages were penned.

3rd. The illustrations are not all as good as I would have had them. Most of them are mere diagrams made by myself. For any inaccuracies I alone am responsible; for any artistic value that they may possess, the credit is wholly due to Léveillé, Lackerbauer, and Vien, of Paris; and to Mr. Orrin Smith, of London.

A word of explanation on another point. It will be seen that I have not touched upon the accidents of parturition, such as fistulæ of the bladder, rectum, and vagina, lacerated perineum, &c. It is only just to myself to say that I have ignored these for the present, because I hope, if time and circumstances permit, to prepare, at no distant day, a fully illustrated monograph on these subjects. To have done them ample justice here would have interfered, in some sort, with the plan, and augmented very considerably the size of this volume.

In conclusion I beg leave to say that I am under special obligations to Dr. Thos. D. Pratt for timely aid; and I take this occasion to return my sincere thanks to my friend, Mr. Ernest Hart, for useful suggestions and valuable assistance rendered as these pages were passing through the press.

London: 1, Bolton Row, May Fair,
1*st January*, 1866.

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UTERINE SURGERY.

INTRODUCTION.

I do not propose to write a complete monograph on Uterine Surgery, or on the treatment of sterility, but simply to interweave the two, while taking a glance at such surgical difficulties as seem ordinarily to interfere with conception. To make a work of this sort complete would be to write a book on all the diseases of women, and on some of those of the opposite sex. But this is not my object, and I shall confine myself to the consideration of such cases as ordinarily come under the observation of the practitioner.

An inquiry into the conditions favourable to conception would almost necessarily involve a consideration of those opposed to it; and this would lead very naturally to the investigation of the best means of overcoming such obstacles. This is the order in which I propose to consider the subject; but it is not the one by which my experience was gained. It came by a very different process.

In the course of treating the diseases of women, I, like others similarly engaged, found many cases of sterility accidentally cured simply by curing some uterine affection. After a while I discovered that they were as various and as varying as the diseases upon which they depended. Then, by a classification of all diseases of the

uterus just as they were encountered, I found sterility to be incident to many of them. These naturally arranged themselves into two classes; viz.,—1st. Those who had never conceived; and—2nd. Those who had; but who for some reason had ceased to do so for a time, say five years, or more. The first I called "Natural Sterility;" the second, "Acquired Sterility."

In looking over my note-books for a series of years, I was surprised to see how nearly equal these two classes were. Sometimes one and then the other would predominate; but they were so evenly balanced, that from 3 to 6 per cent. would cover the variation either way.

I mean that this is so, taking all cases of uterine disease as they are promiscuously presented. If we consider the cases of those only who come to consult us merely on the subject of sterility, without reference to disease or actual suffering, the first class will, of course, greatly predominate. But it is by a study of all, that we deduce the principles that are to guide our judgment in individual cases. It is by this that we are able to specify the conditions most opposed to conception; and, at the same time, those most favorable to it.

The trouble in one case may depend upon mere contraction of the os; in another upon malformation of the same—in another upon engorgement of the cervix—in another upon elongation—in another upon hypertrophy—in another upon simple induration—in another upon curvature of the canal of the cervix—in another upon polypus—in another upon a fibroid—in another upon malposition of the uterus—in another upon some anatomical anomaly or malformation of the vagina—in another upon vitiated secretions of the cervix—in another upon those of the vagina, the one generally acting mechanically, the other chemically—in another upon the

absence of spermatozoa; while others may be complicated with several of these anomalies, all subjects of study and investigation.

And when we come to analyze these various causes and complications, they are resolved into one great general principle, embracing all manner of obstructions to the free passage of living spermatozoa into the cavity of the womb. In all curable cases ovulation must be perfect, and the faulty link must be found in defective fructification, or else all our efforts are in vain. If the woman has passed the period of ovulation, of course we can do nothing for her. If the ovum never passes into the fallopian tubes, a thing impossible to determine, it is equally beyond remedy. We may safely assume a normal menstruation as a sign of normal ovulation. This being our guide, we may hope, in the majority of cases, to find some of the troubles above enumerated, many of which are eventually curable.

It is self-evident that if we knew exactly all the conditions of the uterus and its appendages absolutely essential to fecundation, it would not be very difficult to determine, in any given case, in what particular it differed from the proper standard. And, on the other hand, if we knew exactly the conditions of the uterus and appendages absolutely opposed to fecundation, it would not be very difficult to determine at once the chances of cure.

This is but another way of saying that here, as in every other department of medicine, knowledge of both normal action and abnormal condition is essential to safe and sure methods of treatment.

A few years ago, the subject of conception was wrapped in the profoundest mystery; but now, thanks to the labours of Martin Barry, of Bischoff, of Coste, of

Pouchet, and other modern physiologists, its laws are much better understood.

As usual, pathology is here behind its great pioneer, physiology, and yet quite in advance of therapeutics; for until a comparatively recent period we had no rational views on the treatment of the sterile condition; and almost all that is now known has emanated from the Edinburgh school. Indeed, little or nothing has been added to the labours of McIntosh and of Simpson; and the English language presents us with but one complete monograph on the subject,—that by Dr. A. K. Gardner,* of New York.

Macintosh † discovered that most of his sterile patients had a contracted os and cervix; and he conceived the idea of dilating these by bougies, such as were used ordinarily for stricture of the urethra. His success was very remarkable, but none of his followers were able to attain equally good results. Simpson, seeing the uncertainty and even danger of dilatation, had the happy thought of incising the os and cervix to render their enlargement more thorough and more permanent. The results have not been all that were hoped for; but enough has been done to show that we are at last on the highway of improvement; and it seems to me that further advances must be made as heretofore, by means almost purely surgical.

From any point of view this subject is one of great importance; for the perpetuation of names and families, the descent of property, the happiness of individuals, and occasionally the welfare of the State, and even

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* "On the Causes and Curative Treatment of Sterility," by A. K. Gardner, M.D., &c., New York. 1856.

† Macintosh's "Pathology and Practice of Physic."

the permanence of dynasties and governments, may depend upon it.

Without further preliminary remarks, let us then inquire, "What are the conditions essential to Conception?"

1.—It occurs only during menstrual life.

2.—Menstruation should be such as to show a healthy state of the uterine cavity.

3.—The os and cervix uteri should be sufficiently open to permit the free exit of the menstrual flow, and also to admit the ingress of the spermatozoa.

4.—The cervix should be of proper form, shape, size, and density.

5.—The uterus should be in a normal position, *i.e.*, neither ante-verted, nor retro-verted to any great degree.

6.—The vagina should be capable of receiving and of retaining the spermatic fluid.

7.—Semen, with living spermatozoa, should be deposited in the vagina at the proper time.

8.—The secretions of the cervix and vagina should not poison or kill the spermatozoa.

I lay these down as postulates, embracing the general principles or laws most favourable—indeed, essential to fecundation; and I propose to take them up seriatim, and to show, from clinical experience, wherein the sterile condition differs from the fecund, and to point out, so far as we know, the surest methods of relief.

But before entering upon this discussion, it will be well, perhaps, to say something

On the Method of Uterine Examination.—Almost

every physician accustomed to treat the diseases of women has educated himself to some peculiar method of examination. I propose here to give my own plan.

Every thorough uterine investigation is naturally divided into two stages, the first requiring the touch, the second the sight; the dorsal decubitus for the one, the left lateral for the other. For the touch alone, the patient may lie on a sofa or a bed; but the one is too low, and the other too soft and yielding, for a speculum examination. I therefore prefer a common table, two or three feet wide, and four or five feet long, covered with a wadded quilt, or blankets folded. This is a little more formidable, but it is better for both physician and patient. Indeed, it is essential, if we wish to make a very thorough examination. The table being properly prepared, the patient is requested to loosen all the fastenings of the dress and corsets, so that there may be nothing to constrict the waist or to compress the abdomen. While this is being done, the physician should bathe his hands in warm water, and wash them well. It may seem odd to insist upon this, but I do most earnestly; 1st, because it softens and warms the hands; 2nd, because it insures their cleanness; and 3rd, because it assures our patient against any dread of contamination by the touch, a thing by no means to be despised.

All being ready, the patient is now requested to sit on the edge of the table, and then to lie down on the back, with the head, but not the shoulders, supported by a pillow, while the feet rest momentarily on a chair.

Many practitioners allow the feet to hang down, each on a chair, but this is by no means the best plan for either physician or patient, nor is it the most deli-

cate. As soon as the patient is laid comfortably back on the table, the surgeon will raise her feet from the chair, upon which he is now to sit down, and place them on the edge of the table, with the heels separated some ten or twelve inches, while the knees are a little wider apart. This flexure of the thighs and legs insures the relaxation of the abdominal walls. Some patients will at first, in spite of our entreaties, place the soles of the feet together, and let the knees fall widely apart, while others will unconsciously hold the knees closely together, and brace the feet firmly outwards, each condition being equally opposed to an easy exploration of the vagina.

The patient once on the back, with the extremities properly flexed and fixed, must be assured that there is to be neither pain nor exposure of person; this last being more dreaded than the most intense suffering.

Everything being ready, let the left index finger be well lubricated, not with sweet oil, which is often gummy and sticky, nor with grease, which is often rancid, but with warm water and Castile or other fine soap, which is a cleaner, cheaper, and better lubricant than any other. Pass the finger into the vagina—do it gently—if otherwise, we may jar the nervous system, and produce involuntary spasmodic action of the abdominal muscles. The patient may become agitated and alarmed, and we may perhaps be compelled to procrastinate a very minute examination to some future time. As the finger passes, let it ascertain if there is anything abnormal about the ostium vaginæ. Is it contracted, rigid? Is the hymen present or absent? Is it irritable or tender? Then as to the vagina: Does it dip down towards the coccyx? Does it run more in the direction of the axis of the pelvis? Is it of normal

temperature? Is it short? Is it deep? Is it narrow? Is it capacious? Does it contain any foreign body? If so, is it something inorganic, previously introduced? Or, is it something organic, growing on the walls of the vagina, on the os tincæ, or does it come from the cavity of the uterus? Is it benign or malignant? Then what of the womb? Is the os open or closed, large or small? Is the cervix too long, too pointed, too small, too large? Is it indurated or ulcerated? Is the body of the organ in its proper position? Is it ante-verted, retro-verted, or flexed in any direction? Is it larger or smaller than natural? Is it of proper form? Is it indurated? Is it fixed or movable? Is there any complication, ovarian or fibroid?

All of these conditions are ascertainable by the touch alone. We need no speculum to tell us of the volume, position, and relations of the uterus and its appendages.

But I should not omit to say that the mere touch by the vagina is not alone sufficient.

It is necessary to make pressure with the right hand on the abdomen in the hypogastric region at the same time that the left index is carried into the vagina. The two hands then act conjointly in ascertaining the condition and relations of the uterus.

Is it in its normal position? Then the os uteri will rest on the end of the left index finger, while the fundus will be distinctly felt by the other hand, in a line drawn from the os, in the direction of the umbilicus.

Is it ante-verted? Then the os will be very far back towards the hollow of the sacrum, while the fundus will be felt by the index just behind the symphysis pubis, pressing down upon and perhaps parallel with the anterior wall of the vagina.

But I repeat that the touch by the vagina is not

enough to determine this point positively, and it is essential always to make pressure at the same time with the other hand, just above the pubes. It will

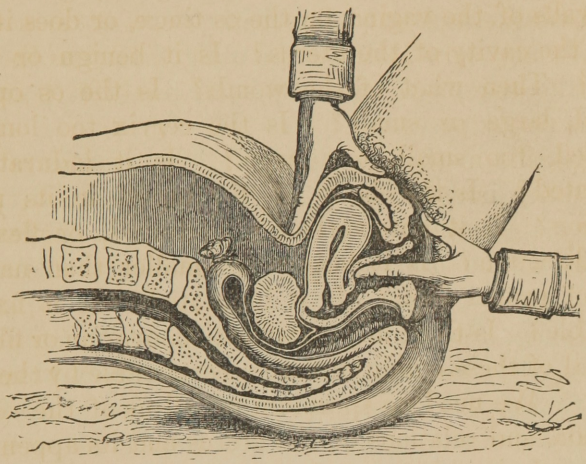

Fig. 1.

then be very easy to measure the size and shape of the body of the womb, for it will be held firmly between the fingers of the two hands, and its outline and irregularities will be ascertained with as much nicety as if it were outside of the body. Thus isolated, we determine its condition as easily as we would that of a pear wrapped up in a common towel or napkin.

The retro-uterine region, represented here as being occupied by a small tumour, is quite as easily explored by the touch alone. To do this, pass the left index finger to the posterior *cul de sac*, hook it up behind the cervix uteri, raise this upwards, draw it forwards, and at the same time press the outer hand in the direction of the point of the left index.

In a thin subject, where there is nothing abnormal,

the external fingers and the internal one can be brought very near together behind the cervix, without pain to the patient or inconvenience to the operator; and if there is anything abnormal, this manipulation is sure to detect it.

We may now and then be obliged to pass the finger into the rectum to clear up some doubtful point; but this is rarely necessary.

By this method, versions, flexions, fibroid offshoots, and other irregularities, are readily detected; and if at any time there is a doubt about the direction or depth of the uterine cavity, the sound will at once clear it up.

Having ascertained all these points by the touch, we are ready for the second stage of the examination—viz., that by the speculum. As before said, for the digital examination, the dorsal decubitus is preferable; but for the speculum, the left lateral semi-prone position is the best.

In 1845 I first used my speculum for vesico-vaginal fistula operations, placing the patient on the knees. I rarely resort to this method now, but as it may sometimes be necessary in a complicated case of vesico-vaginal fistula, or in some forms of malignant disease, I shall here quote the following from my first paper on this subject, published in the *American Journal of Medical Sciences*, January, 1852.

"In order to obtain a correct view of the vaginal canal, I place the patient on a table, about two and a half by four feet, on her knees, with the nates elevated and the head and shoulders depressed. The knees must be separated some six or eight inches, the thighs at about right angles with the table, and the clothing all thoroughly loosened, so that

there shall be no compression of the abdominal parietes. An assistant on each side lays a hand in the fold between the glutei muscles and the thigh, the ends of the fingers extending quite to the labia majora ; then by simultaneously pulling the nates upwards and outwards, the os externum opens, the pelvic and abdominal viscera all gravitate towards the epigastric region, the atmosphere enters the vagina, and by its pressure, soon stretches this canal out to its utmost limits, affording an easy view of the os tincæ, fistula, &c. To facilitate the exhibition of the parts, the assistant on the right side of the patient introduces into the vagina the lever speculum, represented in fig. 2, and then, by lifting the perineum, stretching the sphincter, and raising up the recto-vaginal septum (fig. 3), it is as easy to view the whole vaginal canal as it is to examine the fauces, by turning a mouth widely open to a strong light.

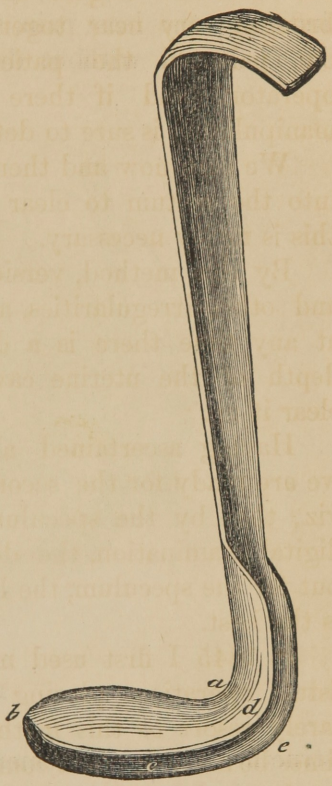

Fig. 2.

"This method of exhibiting the parts is not only useful in these cases, but in all affections of the os and cervix uteri requiring ocular inspection.

"The most painful organic diseases, such as corroding

ulcer, carcinoma, &c., may be thus exposed without inflicting the least pain, while any local treatment may be instituted without danger of injuring the healthy

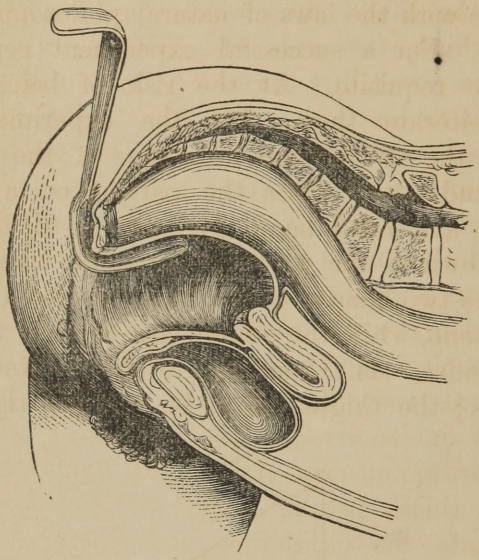

Fig. 3.

structures. By this method also a proper estimate, anatomically, can be had of the shape and capacity of the vagina; for where there is no organic change, no contraction, and no rigidity of it from sloughs, ulcers, or cicatrices, and where the uterus is movable, this canal immediately swells out to an enormous extent."

Thus I wrote in 1852; and I have introduced figs. 2 and 3, copied from the *American Journal of Medical Sciences* of that date, merely for the purpose of contrasting my past and present methods of vaginal exploration.

Many persons who have never witnessed the use of my speculum, doubt the correctness of my explanation of its rationale as given above. But let such experiment for themselves, and give us a rationale more in accordance with the laws of natural philosophy, if they have one. For a successful experiment certain conditions are requisite. At the risk of being tedious, I will reiterate them. Let the experimenter first loosen all the strings and fastenings of the dress and corsets, and then place the patient on a table on her knees, and bend her body forwards till the head is brought down to the plane of the table, where it may rest in the two hands, its weight supported on the left parietal bone, while the elbows are thrown widely out from the sides. The knees are to be separated eight or ten inches; the thighs are to be at about right angles

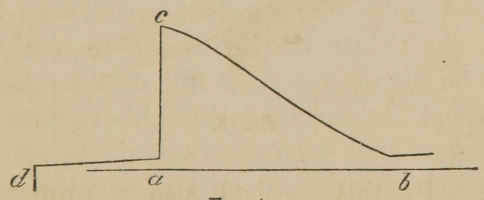

FIG. 4.

with the table; thus the plane of the table (*ab*), the axis of the thighs (*ac*), and that of the body (*cb*), would form a right-angled triangle, of which the thighs and table would make the right angle, and the body the hypothenuse. The patient must be taught to maintain unflinchingly this position; she must not pitch forwards and make the pelvian angle (*c*) obtuse, nor draw the knees up under the body, making it more acute; she must not arch the spine (*cb*) upwards, for this brings into forcible action the abdominal muscles, which should

be perfectly relaxed, with the spine rather curved downwards, as we see it in sway-backed animals. With these precautions fully impressed on her, she is to breathe easily, and relax the muscles of the abdomen. In consequence of this position quietly retained for a few moments, the movable abdominal and pelvic viscera necessarily gravitate towards the epigastrium. Now, if the surgeon will get immediately behind his patient and lay his hands on the nates, and push them gently upwards and backwards, taking care that her position is not changed, he will see the mouth of the vagina open, and at the same moment hear the air rush into it with a blowing or hissing sound; and then if he will, with even his finger, raise the perineum up towards the os coccygis, he will see the vagina distended like an inflated bladder. If, however, he will use my speculum instead of the finger, the cavity of the vagina will be more easily seen.

If he will now remove the instrument (or finger), and allow the mouth of the vagina to close, and then if he will let his tired patient fall over on her side, he will have audible and unmistakable evidence of the sudden escape of air from the vagina. In private practice, even with the patient on the side, this is such an unpleasant occurrence, and so mortifying to a sensitive person, that I generally keep a catheter by me, to be placed momentarily in the vagina, that the air may escape noiselessly. If we fail in the above experiment, it will be because we have omitted some of the conditions essential to success.

The object of this speculum (whether used with the patient on the knees or on the side) is to elevate the perineum and to partially support the posterior wall of the vagina; the pressure of the atmosphere with the gravitation of the viscera does the rest. All other

specula act directly on the walls of the vagina, which they mechanically distend. This one, as a rule, touches but a small portion of the posterior wall.

I was led to the invention of this speculum by a singular incident. As showing from what trifles important results sometimes spring, I venture to record here the circumstances. I feel the more justified in this because my speculum is by some in England, and by a few on the continent, called by the name of another man, who had nothing to do with it, except to hand it to the instrument-makers here to be copied, and who in their turn have been the unconscious agents of doing me a great wrong. In December, 1845, a lady was riding on a pony in the suburbs of the city of Montgomery, Alabama, where I then resided. It took fright and suddenly jumped from under her—she fell, striking her pelvis on the ground. I saw her soon afterwards; her sufferings were very severe. Besides the contusions from the fall, she complained of rectal and vesical tenesmus. On examination, I found a complete retroversion of the uterus. I had been taught by lectures and books that the best method of reducing a recent luxation of this organ was to place the patient on the knees, and then act on the uterus through the rectum and vagina. This lady, covered with a sheet, was so placed across her bed. I then introduced a finger into the vagina, but effected nothing by it. Not wishing to pass the finger into the rectum, which is always disagreeable, and to be avoided if possible, I introduced the middle and index fingers together into the vagina, and while I was making efforts to replace the uterus, all at once it happened that I could not touch the uterus, nor even the walls of the vagina, and my fingers were swept around in the pelvis without touching or being touched by anything except

just where they were grasped by the mouth of the vagina. While I was wondering what could be the cause of this anomaly, my patient said she was relieved from the symptoms of which she was complaining so seriously but a few moments before. As she was relieved, although I did not understand how it was done, my duties to her were of course at an end. She was large and heavy ; letting her go, I requested her to lie down. Being quite exhausted from pain and the unnatural position in which she had been placed, she threw herself quickly down on her side, when the sudden escape of air from the vagina gave a ready solution of my dilemma, as well as of the rationale of the reduction of the dislocated uterus, which was now found to be in its normal position. And what was its rationale? When the patient was in the position described, there being a natural tendency of the pelvic viscera to gravitate towards the epigastric region, it would require no great *vis a tergo* to produce the desired result in a recent case of this kind. One finger, however, was not long enough to throw the organ up, nor were the two ; but when they were both introduced, in my varying manipulations and strenuous efforts, the hand was accidentally turned with its palm downwards, which thus brought the broad dorsal surface of the two parallel fingers in contact with the vulvar commissure, thereby elevating the perineum and expanding the sphincter muscle, which allowed the air to rush into the vagina under the palmar surface of the fingers, where, by its mechanical pressure of fifteen pounds to the square inch, this canal was suddenly dilated like a balloon, and the uterus replaced by its pressure alone. Having at this time a patient with a vesico-vaginal fistula, which I could not understand, I placed her in the position above

described, and used the handle of a spoon, curved at right angles, to open the vagina, elevate the perineum, and allow the air to enter, which afforded me a complete view, not only of the fistula, but of the whole vagina; whereupon this instrument (page 11, fig. 2) was a self-suggested affair.

During my residence in Alabama, up to 1853, I had no need of any better form of instrument, or any other position for its application than that above described; but when I went to New York, a larger field of observation soon proved to me that it was essential to modify both instrument and position, if they were to be used in the every-day treatment of the ordinary affections of the uterus; for while a patient afflicted with such a terrible infirmity as vesico-vaginal fistula is ready and willing to be placed in any position, however fatiguing, a moment's reflection will show that this kneeling posture would be quite out of the question in the treatment of the simple forms of uterine disease, as they occur in the higher grades of life.

With this necessity before me, I went to work to improve my speculum, and at the same time I discovered that it could be used as efficiently with the patient on the left side as on the knees. For nearly twenty years I have used no other speculum, and whenever, in these pages, I have occasion to speak of the speculum, let it be remembered that I allude always and only to this one (fig. 5), with the patient necessarily on the left side. It is the best speculum for any purpose, whether it be for the application of the simplest dressing, or for the execution of the most difficult operation.

I must of course make an exception in favour of the conical ivory speculum, whenever it is necessary to apply the hot iron, a thing rarely done in America.

The speculum is univalve or duck-billed, as some have called it. For the sake of convenience, two specula of unequal sizes are attached to the same handle, one

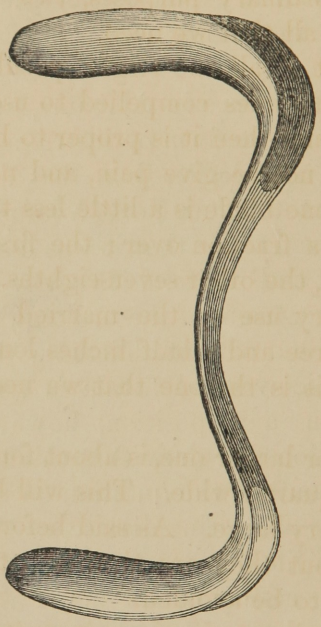

Fig. 5.

at each extremity. This handle may be slightly bent, as seen in fig. 5, or it may be perfectly straight, as I formerly used it (fig. 2). The only object in the slight curvature is to facilitate its leverage in prolonged operations. The assistant may become tired of holding on to the distal end, and then it is a great relief to grasp the shaft in the middle, where it is gently curved. The object of having two blades or specula to one shaft is merely to have them of different sizes so as to suit different vaginas ; for there are no two vaginas exactly alike, any more than there are two faces precisely alike.

I have one with a blade six inches long, another but two inches, and another of the ordinary length, an inch and three quarters wide. But these sizes are very rarely needed. For ordinary purposes, two instruments, *i.e.* four blades, are all that we need.

The smallest I call the virgin speculum; for unhappily we are sometimes compelled to use a speculum on the unmarried, and then it is proper to have it of such a suitable size as not to give pain, and not to injure the hymen. Here one blade is a little less than three inches long, the other a fraction over; the first three-quarters of an inch wide, the other seven-eighths. But the speculum for ordinary use on the married has the smaller blade about three and a half inches long, by about one inch wide. This is the one that we need in nine cases out of ten.

The other, or larger one, is about four inches long by an inch and a quarter wide. This will be needed where the vagina is very large. As said before, they are made much wider; but they are then apt to produce pain, a thing always to be avoided.

In all vaginal examinations, it matters not for what purpose, a speculum should never be used till we have by the touch first and fully ascertained the condition of the uterus and its appendages.

This injunction is particularly imperative, and for the most obvious reasons. 1st, because the size of the speculum should be always adapted to the capacity of the vagina; a small speculum in a large vagina is comparatively useless; on the contrary, a large speculum in a small vagina is cruelly painful. 2nd, because it should be passed in the direction of the axis of the vagina, taking care not to strike it against the cervix uteri, particularly if this be the seat of granular erosion, of poly-

pus, of cauliflower excrescence, or other hæmorrhagic disease, all of which should be previously ascertained by the touch.

It has been objected to this speculum, that its use requires the assistance of a third person. Apart from its real value, there could be no stronger reason for its universal adoption. I insist that a third person should always be present on such occasions. Delicacy and propriety require it, and public opinion ought to demand it. I do not mean lay, but professional public opinion.

I am sure that I never made a vaginal examination, or used a speculum a dozen times in my life without the presence of a third person. I have never had a patient to object who was educated or sensible; but the silliest person would see the necessity of it when told that propriety required it, even if an assistant were not necessary. The few that have objected to the presence of another person in the room at the time of a speculum examination, have done so from the fear of personal exposure. We are too apt to disregard this innate feeling of delicacy when we have been much used to hospital practice; but we can never make a mistake if we always cultivate the same gentleness and kindness towards the poorest hospital patient that we would use towards the highest princess. I repeat, then, that we should never in our examinations allow any exposure of person, not even in hospital practice. When the touch is made, there can be none, of course, with the patient on the back, and covered with a sheet. When the speculum is used, we should see only the neck of the womb and the canal of the vagina.

I have said that for a speculum examination there is nothing better than a table covered with a quilt or

blankets folded, and this is literally true ; but for the consultation-room I have a chair which has served such a good purpose that I introduce it here, that others may profit by it.

Some twelve or fifteen years ago, Mr. James Holmes, of Charleston, S.C., was driven to the necessity of inventing what he called an "Invalid Chair. The patient sitting in this chair (fig. 6), can with the greatest ease

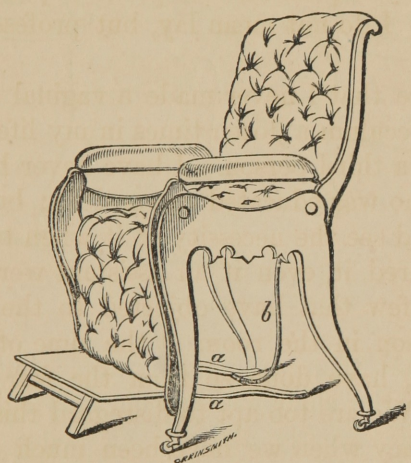

Fig. 6.

and without an effort poise the body for any length of time, at any angle between the erect and horizontal postures. Mr. Holmes invented this chair especially for a near relative of his, who suffered from prolonged attacks of (I believe) gout or some other very painful affection. It is much used in America, and was even introduced on some lines of railway as a sleeping-chair. I am thus minute, because I do not wish to claim it as mine. To adapt it to my own practice I had it made 24 inches wide instead of 18, and 30 inches high instead

of 22. I have added legs or uprights, *a*, *a*, to support the lower part of the chair when it is extended in the form of an operating-table (fig. 7). There is also an elastic cord, *b*, to pull these uprights back under the chair when it is changed from a table to a mere chair again. For all practical purposes it is really no better,

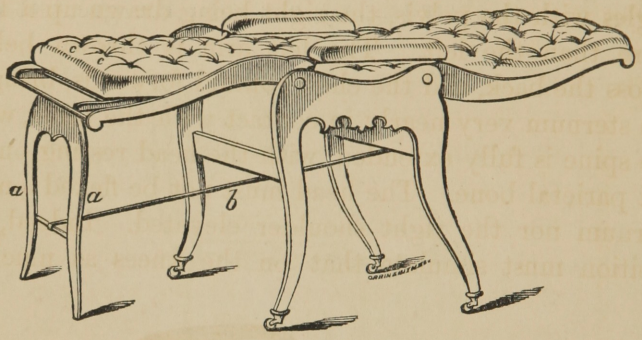

Fig. 7.

as before said, than a common table; but any patient would sit in the chair without nervous agitation, while some become greatly alarmed at being requested to mount a table. The patient once seated, is told that the chair is only a couch, and she is requested to lean back and extend it horizontally by her own weight, with perhaps a little assistance from the nurse who stands at the back of the chair. I am almost afraid to write these little things, but I do it only for my younger brethren, who may need to learn the importance of educating their patients to feel that everything is being done that delicacy and propriety require on an occasion so trying to a sensitive nature.

When the patient lies back and the chair is extended in the form of a table, it will be necessary to draw the

person down to the lower edge of it, *c c*, whether for a digital or speculum examination. Afterwards the patient moves again up on the centre or seat of the chair, the uprights, *a*, *a*, are drawn back, and the chair almost voluntarily assumes its proper form.

For a speculum examination the patient is to lie on the left side. The thighs are to be flexed at about right angles with the pelvis, the right being drawn up a little more than the left. The left arm is thrown behind across the back, and the chest rotated forwards, bringing the sternum very nearly in contact with the table, while the spine is fully extended, with the head resting on the left parietal bone. The head must not be flexed on the sternum nor the right shoulder elevated. Indeed, the position must simulate that on the knees as much as

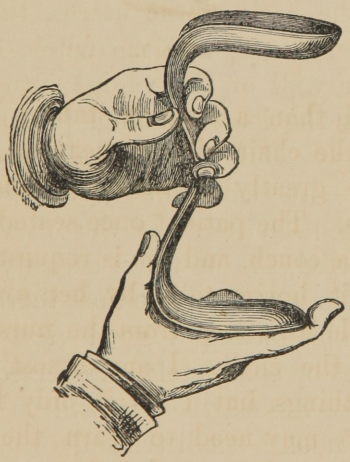

Fig. 8.

possible, and for this reason the patient is rolled over on the front, making it a left lateral semiprone position. The nurse or assistant standing at her back pulls up the

right side of the nates with the left hand, when the surgeon introduces the speculum, elevates the perineum, and gives the instrument into the right hand of the assistant, who holds it firmly in the desired position.

The introduction of the speculum is a matter of some importance. It is done under cover, with the right index finger as a guide, as seen in fig. 8. The object of this is to prevent the point of the instrument from striking against the cervix uteri. The finger is not to be withdrawn till we are sure that the end of the speculum has passed beyond the cervix, or is well turned back towards the rectum. If the patient breathes easily, the vagina will be immediately distended by the pressure of the atmosphere, so as to bring the neck of the uterus, the posterior cul-de-sac, and the whole of the anterior wall of the vagina into view, without the least traction, pressure, or suffering. But if she is alarmed and breathes hurriedly, or bears down, it will be otherwise. If the uterus be retroverted, the os tincæ is easily seen. If it be in a normal position, there is no trouble in getting a good view of it; but if it be completely anteverted, with a narrow vagina, then it will be necessary to hook a small tenaculum into the anterior lip, and pull it gently forwards, as shown in fig. 14, where the manner of introducing the sponge-tent is illustrated. The tenaculum is to be slightly inserted into the mucous membrane. It gives no pain,

Fig. 9.

Fig. 10.

and produces no bleeding, unless there is great engorgement ; but even then it amounts to nothing. Another plan of bringing the os tincæ into view is to draw the neck forwards by pressure in the anterior cul-de-sac with this instrument (fig. 10), which I call the uterine depressor.

I have never known any one accustomed to this method and these instruments who was willing to revert to the old plan.

The consideration of other means of exploration, such as the sound, tent, &c., I leave till we come to speak of treatment.

SECTION I.

CONCEPTION OCCURS ONLY DURING MENSTRUAL LIFE.

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This is so self-evident, that it might be passed without further notice. I do not know that conception has ever occurred previously to the appearance of the menstrual flow. Cases are recorded where it happened at a very tender age ; but it was always preceded by the appearance of the function that we are taught to look upon as evidence of the fitness for conception. As an example, I may cite the following, which is perfectly authentic.

Dr. Curtis, of Boston, examined into the particulars of a case of early pregnancy that occurred in the poor-house of that city, and reported "that the girl Elizabeth Drayton became pregnant twenty-four days before she was ten years old, and was delivered of a fine, full-grown male child, weighing fully eight pounds, when she was ten years eight months and seven days old. The reputed father of the child is said to be about fifteen years of age. The mother menstruated once or twice before conception, was tolerably healthy during gestation, and had rather a lingering but quite natural labour." *

Conception has occurred at an advanced period, and even after a supposed change of life.

An instance of this sort fell under my observation in the state of Alabama, in 1840, where an old negro woman (said to be 58 or 60) became a mother, after

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* *Medical Times and Gazette*, April, 1863, from the *Boston Medical Journal*, February 19th, 1863.

having ceased to have children for more than twenty years.

I regret exceedingly that I did not investigate this case more minutely, but in my younger days I did not feel much interest in the subject. But I now know of two well-authenticated cases of parturition at the age of fifty-two.

Many women conceive without menstruating, but it is always during menstrual life. Most accoucheurs have doubtless met with such cases.

I know a lady some 36 or 38 years old, who is the mother of six children, three of whom were born (at single births) without the least sign of intermediate menstruation. She menstruated soon after marriage, immediately conceived, was safely delivered at term, and while nursing found herself pregnant again; she then weaned her child, went the full term with the second, was fortunately delivered; and while suckling it, became pregnant a third time. She thus bid fair to have a large family very rapidly, but unfortunately, after her third confinement, she got some uterine disease that arrested her child-bearing for several years.

Dr. Emmet and myself saw a case still more remarkable than this in 1859. One of the patronesses of the Woman's Hospital requested me to visit a poor woman, a *protégée* of hers, who was supposed to have ovarian dropsy, which had increased so rapidly that she apprehended an early fatal result. On visiting the patient, she told me that the tumour began to grow not very long after the birth of her last and eighth child, which was now some twelve or thirteen months old. She was still suckling it, and it seemed to be drawing her very life out of her. She was in bed, greatly prostrated from

want of proper and sufficient nourishment, and from the exhaustion of super-lactation, all of which had been supposed to belong to the rapid growth of the tumour. Laying my hands on the abdomen for palpation, I instantly detected fœtal movement. I asked her if she suspected pregnancy; she said no, nor had she felt any quickening, although the movements of the child were by no means feeble. The touch showed the mouth of the womb dilated fully two inches, with the head presenting. Labour set in the next day, and she was happily delivered by Dr. Emmet of a fine vigorous child. This was her ninth labour in fourteen or fifteen years; and she told Dr. Emmet, that during the whole of her married life she had menstruated but three times; thus, notwithstanding the accepted views of the profession in regard to the relation of menstruation to conception, we find anomalies, which, however, are so rare that they do not invalidate the rule.

It is a little curious that a woman should have had eight pregnancies, and have gone the full term of the ninth, without the least consciousness of a movement of the fœtus.

But there was evidently no malingering, for she was immediately raised from the deepest despair to the greatest joy, when her tumour was pronounced to be a living child to be born in a few hours. I have seen several cases of pregnancy where the mothers were totally unconscious of any movement on the part of the child. I allude to this as a subject of interest to the profession at large; for an error in diagnosis, whether in failing to detect pregnancy when it exists, or in asserting it where it does not exist, always injures us as a body, and sometimes inflicts injury on the subjects of our mistakes.

A lady, married about twenty-three years, and childless, became irregular at forty-three. Her physicians said it was incipient change of life, which was doubtless true. After a few months of irregularity, the menses ceased entirely. With this change many women anticipate evil in some form or other. This poor sufferer expected cancer, but instead of that her physicians detected a pelvic tumour. She was plied with iodine for a long time, and had flying blisters alternately over the iliac regions; but in spite of the most active means the tumour continued to grow. Her case was considered hopeless, and it was thought advisable for her to return to the place of her nativity to die amongst her friends. On her arrival in New York she patiently resigned herself to her fate, and made all arrangements for her approaching dissolution. After waiting a month in vain, some of her friends persuaded her to have other medical advice, and I saw her. There was not the slightest difficulty in detecting fœtal movement and fœtal pulsation, and when I told her that in two weeks she would need baby-clothes instead of a shroud, and a cradle instead of a coffin, she could not believe it. During the whole of her pregnancy she was not conscious of any motion.

Here the mistake was fraught not only with damage to the profession, but with loss to the husband, for, engaged in a profitable business, he was compelled to sell it off at a sacrifice, and to make a long journey to New York, when he should have remained at home. I have seen many similar mistakes, and that too since the days of Dr. Kennedy's beautiful work on Obstetric Auscultation. * We may be in doubt about any case up

* "Observations on Obstetric Auscultation; with Analysis of the

to the fifth month of pregnancy, but never after that; for then the beating of the fœtal heart will infallibly guide our judgment. Dr. Routh,* of the Samaritan Hospital, has detected pregnancy as early as from the sixth to the thirteenth week by means of his vagino-scope, which, coming directly in contact with the cervix uteri, gives an earlier indication of the placental souffle than we could get by the stethoscope.

Mistakes sometimes occur in the hands of the best men in the profession, and then it is the result wholly of carelessness. For example, a lady, thirty-five years old, the mother of several children, had a small fibroid tumour on one side of the womb. Her physician, a most accomplished diagnostician, watched the progress of this tumour, which seemed to be stationary for a long time. I should remark that from the time the tumour was observed, the patient ceased to have children. And so things went on for five or six years, when the abdomen began to enlarge, and as we sometimes see in ovarian tumours, the menses ceased. The physician put her on bromide of potassium internally, and tincture of iodine externally. In spite of this the tumour continued to enlarge, and her physician brought her from a neighbouring city to me. I had only to lay my hands on the abdomen to detect motion, and with the stethoscope the fœtal heart was easily heard. Now, here the physician, having his mind full of the fibroid growth from which he had so long anticipated evil, never made any thorough

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Evidences of Pregnancy; and an Inquiry into the Proofs of the Life and Death of the Fœtus in Utero." By Evory Kennedy, M.D., &c. Dublin: Hodges & Smith. 1833.

* "On Some of the Symptoms of Early Pregnancy." By C. H. F. Routh, M.D., &c. London: T. Richards. 1864. Pp. 21.

investigation of the case after the abdomen began to enlarge, and the patient, who was a most intelligent woman, declared she had not for a moment suspected pregnancy, and that she had not experienced the slightest sensation of motion.

While on this subject, I may mention an opposite class of cases in which we occasionally make grave mistakes. A hysterical sterile woman, naturally anxious for offspring, imagines herself pregnant, denies that she menstruates, affects a quickening, seems to grow larger and larger, till at last the fulness of time arrives; she goes to bed, and has some irregular colicky pains; but nothing more. This is a case of hysterical monomania, for which no physician could be responsible; but if called to give an opinion, he should be careful not to be misled by the artful misrepresentations of a "mind diseased." Young women sometimes honestly imagine themselves pregnant, and physicians, I am sorry to say, are occasionally deluded into the support of their whim, notwithstanding the fact that menstruation returns regularly every twenty-eight days, and pursues its usual course.

An example of this sort occurred at Baden-Baden a few years ago, under the care of a very eminent physician, now dead, who allowed his patient to lie in bed for nine months to prevent a miscarriage, when in fact she menstruated regularly during the whole time. At the end of the tenth month another physician was called in, who said the lady had never been pregnant at all.

But while many women go through pregnancy without feeling the slightest motion of the fœtus, a very opposite state of things is occasionally met with about the time of change of life. A woman, forty years of age or more, becomes irregular; she thinks herself pregnant;

by-and-by, she quickens; she begins to make baby-clothes; she tells her intimate friends of her interesting condition; she gradually grows larger; the time for confinement arrives; she is not quite as large as in her former pregnancies; nevertheless she cannot be deceived, for the frequent regular movements of the fœtus make it impossible for her to be otherwise than pregnant. At last she becomes alarmed at the procrastination of the labour, and sends for her physician, who finds the abdomen large, but the enlargement is due to an immense deposit of adipose tissue in its parietes. He passes his finger into the vagina, and discovers the uterus in an unimpregnated state; indeed, it may be smaller than usual, for the cervix may be found rather atrophied, and the whole organ gradually undergoing the change that we always see when change of life occurs.

I have seen several cases of this false quickening, never in a woman under thirty-eight, nor over forty-eight. They had all borne children, and all had a tendency to *embonpoint*. They were all women of culture, refinement, and of good common sense; and so strong in every case was the mental impression of the sense of quickening, that it was impossible to convince them that there was no pregnancy. Two of these ladies returned to me several times in the course of a year, and insisted that I must be mistaken. I now regret having dismissed them so peremptorily, as I thereby lost the opportunity of watching the progress and termination of this freak of change of life.

SECTION II.

MENSTRUATION SHOULD BE SUCH AS TO SHOW A HEALTHY CONDITION OF THE UTERINE CAVITY.

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Of Scanty Menstruation.—If asked what constitutes normal menstruation, I should reply, a painless uncoagulated flow, returning at intervals of about four weeks, lasting three, four, five, or six days, and requiring the use of not more than three, or, at the farthest, four napkins in the twenty-four hours. It may vary from a healthy standard in both quantity and quality. It may be scanty or profuse, and painful or not, without regard to quantity. If the flow falls short of three days' duration, it may be called scanty. If it continues longer than six or seven days, it may be profuse, but not always so. It may be very abundant, and last but two or three days; and, again, it may continue twelve or fifteen days, and be very scanty, requiring not more than one napkin in the twenty-four hours. The explanation of either of these conditions will generally be found in some organic deviation from a normal state.

Conception may take place, whether the menstruation be scanty or profuse. But either extreme is not very favourable to it, not that the amount of blood lost is *per se* an important matter, except as the index of an organic condition, favourable or otherwise to the fulfilment of this great law of nature.

According to modern views, the menstrual fluid is not a secretion, but an exudation of blood from the lining membrane of the cavity of the uterus, which acquires

its peculiar qualities by admixture with the secretions of the cervix and vagina as it passes outwards.

We often see menstruation so scanty, that it lasts but a day, or a day and a half, one napkin having perhaps sufficed for the whole time. Under such circumstances, it has been supposed that there is defective ovulation; but this, of course, is mere hypothesis, for it may or may not be so. It must be admitted, however, that menstruation is a sign of ovulation, the one taking place when the other begins, and ceasing when it stops. With ovulation, we see the uterus suddenly developed in size, the fit receptacle of a new being. With change of life we see it gradually returning to the diminutive proportions that it had before puberty.

In habitually scanty menstruation, if the patient has never borne children, we shall generally find the uterus smaller than usual, with rather a long, pointed, indurated cervix, and if so the os and cervical canal will necessarily be small. On the contrary, if the patient has borne children, the uterus may be larger than natural; but the history of the case will probably show that there has been some puerperal trouble of an inflammatory character, resulting in imperfect involution of the organ. In either case I have not derived the benefit that I had expected from surgical means, such as a cupping pump to the cervix, suction and laceration of the lining membrane of the uterine cavity, and the intra-uterine galvanic pessary of Professor Simpson, which seems to have produced very good results in his experienced hands, and also in those of his pupil, Professor Priestly, of King's College Hospital.

For the general management of this class of cases, I must refer the student to our systematic works (Churchill, West, Hewitt, &c., &c.), and at the same time he

should not neglect Faradization, as taught and practised by Althaus,* of London, and Duchenne† (de Boulogne), of Paris. Nor should he fail to study the brief monograph of Dr. Chapman,‡ on cold and heat in the treatment of the functional diseases of women.

It is now pretty well understood that electricity judiciously administered is especially valuable as an emmenagogue in young women, where the menstrual function has not yet been fully established, in consequence of a torpid state of the vaso-motor nerves of the ovaries and uterus; and it has also proved successful when the catamenia have been lost after labour, or in consequence of cold shock or mental anxiety.

Of Profuse Menstruation.—The profuseness of menstruation is to be judged of not so much by its duration as by the quantity of blood and the effects of its loss. Sometimes it will be very abundant from its inception to its termination. Again, it may be violent for thirty-six or forty-eight hours, and then moderate to a normal standard. A very good way to judge of the quantity lost is by the number of napkins needed to protect the person and linen. A change of three or four napkins in the twenty-four hours is about a proper number for normal menstruation. If seven or eight be needed, the flow may be called profuse, and if

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* "A Treatise on Medical Electricity, Theoretical and Practical." By J. Althaus, M.D. London. 1859. Pp. 298.

† "De l'Électrisation Localisée et de son Application à la Pathologie et la Thérapeutique." Par M. le Docteur Duchenne (de Boulogne). Paris. Second Edition. 1861. Pp. 89.

‡ "Functional Diseases of Women," &c. By John Chapman, M.D. London: Trübner & Co. 1863.

a dozen or more, then it may be called a menorrhagia.

In the treatment of menorrhagia, we are by no means to neglect general constitutional remedies. Some bleed, but I never saw a case in which I thought this practice justifiable. All prescribe revulsives, tonics, chalybeates, mineral acids, ergot, &c., which treatment is well enough as far as it goes, but does not always strike at the root of the evil; and often valuable time is thus thrown away. I know very well that we may have menorrhagia from mere debility, from super-lactation, and from some temporary engorgement of the portal circulation; but such cases are not very common, and not usually obstinate. If there is anything abnormal in the quantity of blood lost at the menstrual epoch, there is always a cause for it, and we shall generally be able to find it out by directing our attention to the seat and source of the trouble. If the nose bleeds, we try to stop it by the most direct methods in our power. If the hemorrhoidal vessels bleed persistently, we attack them with the *écraseur*, ligatures, nitric acid, persulphate or perchloride of iron. Why, then, should we permit the womb to lose an unnatural quantity of blood without at once interrogating it on the subject? I would not ignore such general means as we all admit to be available, but I would never put off a uterine exploration in any confirmed case of abnormal flow; for where there is an inveterate menorrhagia, there will always be some organic cause for it. It may be due simply to granular erosion; to engorgement of the cervix; to fungoid granulations in the cervical canal, or in the uterine cavity; to polypi of the os, the cervix, or the cavity; to a fibroid tumour, intra-uterine or intra-mural; to inversion of the uterus, to hæmatocele; or it may be

a sign of some malignant degeneration, all giving rise to hemorrhage, and each requiring its own peculiar and appropriate management.

I propose to illustrate, from clinical experience, the surgical treatment of menorrhagia as it may originate from one or the other of these sources. And first,—

Of Menorrhagia from Granular Erosion.—One example of this will suffice. Mrs. ——, aged twenty-eight, of leuco-phlegmatic temperament, confined four years and a half ago, never well since, was greatly exhausted by lactation, and weaned her child at six months, had very profuse menstruation, lasting eight days, some leucorrhœa, pelvic pains, dysuria, &c.—could not walk at all—had to be carried up and down-stairs—was quite anæmic and exhausted, irritable, peevish, hysterical, crying easily and at trifles—had had the usual constitutional and tonic treatment from several physicians without improvement—the uterus in proper position was larger than natural—the edges of the os were covered with luxuriant granular erosions, which could be seen extending up the canal of the cervix. To these granulations I applied chromic acid, which is with me a favourite escharotic. It is more powerful than the nitrate of silver, and ordinarily perfectly painless. It is used thus :—Take a drachm of the salt, which is very deliquescent, and add slowly a drachm of distilled water; the salt is instantly dissolved and ready for use. Dip a small, pointed, solid glass rod in the solution, let it not take up more than a drop or two, and then apply it to the granulations and to them only. It produces no pain, and may be carried into the canal of the cervix or even further. In this case it was applied as far as the os internum two or three times, at intervals of twelve or

fifteen days. A nutritious diet, but no medicine was ordered. In three months the granulations and the menorrhagia were well, and in three months more conception occurred, and resulted in the birth of a son, after five years of suffering.

Menorrhagia from Fibrous Engorgement of the Cervix.—Mrs. ——, aged thirty-one, married at twenty—two children, youngest eight years old—never well since last labour—menstruation formerly normal, but for the last seven years and a half it recurs too early, and lasts often ten days very profusely. Five or six months ago she had it for three months continuously. She is quite exsanguious and exhausted; has had some leucorrhœa for the last four or five years. I was consulted as much for the removal of her sterility as for the relief of the menorrhagia. She had taken chalybeates, mineral waters, &c., and had been treated locally with the nitrate of silver for a very long time without material benefit. The neck of the womb was the seat of fibrous engorgement, with superficial granular erosion. It was considerably hypertrophied and indurated. The organ was in its normal position. The thickened indurated lips of the os uteri were in consequence of their hypertrophy in close apposition, the one against the other, thus mechanically closing the os, although it was large enough to admit a No. 8 bougie. To the granulations on the engorged fibrous cervix I applied the chromic acid as already described, which healed the granular surface in two months, but did not in the least modify the hæmorrhagic tendency. A sponge tent showed that there was nothing abnormal in the cavity of the uterus, and I then determined to incise the os uteri. There were two reasons for this:

1st: The bilateral incision of the os uteri would divide the indurated structure of the cervix through its whole extent up to the os internum, which would probably ameliorate the engorgement, and diminish the hæmorrhage. And 2nd: It would separate the compressed lips of the os uteri sufficiently to permit the spermatozoa to pass to the cavity of the uterus, thereby rendering conception possible; and upon this taking place I hoped for a complete revolution in the nutritive functions of the whole organ, and an ultimate perfect cure.

Accordingly, the operation of incision of the os and cervix bilaterally, was performed on the 1st of October, 1860. The parts healed before the next menstrual flow, which I was delighted to find greatly reduced in quantity; indeed, it was almost natural. In three months

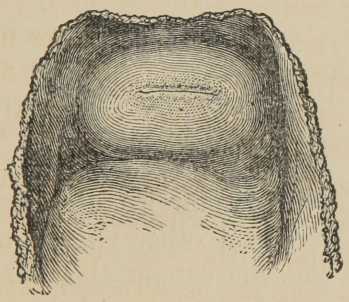

Fig. 11.

she returned home with a normal menstruation. The mouth of the womb presented a totally different appearance from what it did when she first came under my observation. For instance, when I first saw her it was a simple little transverse slit (fig. 11), with the opposite surfaces closely applied to each other; but when she

left it presented an entirely different appearance: the two opposite lips of the os uteri slightly gaping open (fig. 12), thus rendering it possible for the semen to get to the

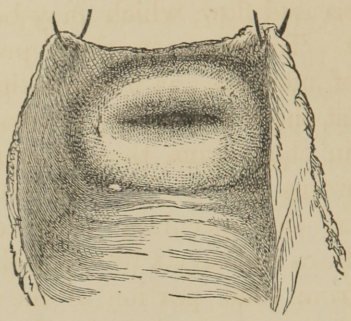

Fig. 12.

fundus uteri. Nine months after this lady left my care she conceived, and I have since heard that she was safely delivered of a fine vigorous child, after an acquired sterility of about nine years. The result is most gratifying, inasmuch as a purely rational surgical treatment effected the cure of both menorrhagia and sterility.

Of Menorrhagia from Fungoid Granulations.— When an old burn and other chronic ulcers refuse to heal, we often find the suppurating surface to be elevated above the level of the sound skin, and we call it "proud flesh," "exuberant granulation," "fungus," or "fungoid granulation." It is usually indolent or insensible to the touch, except, perhaps, just at the cicatrizing edge of the cuticle, and it often bleeds easily on being touched. It is a condition of things very much like this that we here designate "fungoid granulations," as sometimes the source of menorrhagia. These may be in the canal

of the cervix, or in the cavity of the uterus, or in both at the same time; but it is more common to find them in one or the other alone, and perhaps more frequently in the former. Wherever located, they are often the source of an increased flow, which may be remedied by local treatment. To diagnose their presence, let us suppose a case of menorrhagia for investigation. If the touch proves that there is no polypus or other source of it to be found in the vagina, then we must look to the cavity of the uterus for it. If it be from a granular engorged cervix, the speculum at once reveals the cause. But if the os and cervix be in a healthy condition, then it comes from some portion of the utero-cervical canal. Formerly we were left in doubt about the pathology of menorrhagia, but we now explore the cavity of the unimpregnated uterus with the greatest facility, and, no longer groping in the dark, we are able to treat most cases of it understandingly, if not always successfully. Compressed sponge is a very old surgical appliance, but in uterine therapeutics it is of comparatively recent date, and I believe we owe its generalization here to Dr. Simpson; but my own countrymen, Dr. J. P. Batchelder and Dr. W. C. Roberts, of New York, have both written very ably on this subject. Sponge tents are now to be had at most druggists; those that we see in the shops are large clumsy things, thickly coated with wax, tallow, or suet. They are difficult to introduce, and often slip half out of the cervix into the vagina, there exciting an unnecessary amount of irritation. To be sure they are well made, I have them manufactured under my own supervision. They are so indispensable nowadays that I may be pardoned for a little minutiæ on the subject. City physicians can order them from the druggist, but the country practitioner

cannot always do so, and this is my apology for dwelling on the subject.

The sponge should be of good quality, but not too soft and yielding. Of course, it should be thoroughly cleaned; but not bleached, for the bleaching process deprives it of all elasticity. It should be cut into slightly tapering conical pieces, from one to two inches long, some smaller and others much larger than the thumb. A pointed wire or a slender awl should be passed through the centre of the long axis of the sponge, which should then be thoroughly saturated with a thick mucilage of gum arabic. A small twine of cord is then to be closely wrapped around the sponge as it is held stiff by the wire, beginning at the smaller extremity and gradually winding on to the larger; then the wire may be withdrawn, and the new-made tent laid aside to dry. If we are in a hurry it may be dried in the sun or by a fire, taking care not to injure the texture of the sponge by too great a heat.

When it is thoroughly dry, the twine is to be unwound, and the little circular elevations made by it on the surface of the tent are to be rubbed down by fine sand-paper. Without further preparation it is then

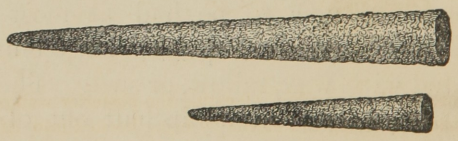

Fig. 13.

ready for use. These diagrams represent the tents about the size and shape that I usually make them. I never allow them to project more than an eighth of an inch from the os uteri into the vagina. Being introduced

without grease, except a little suet just on the point, they seldom slip out of position. If, however, there is a disposition on the part of the cervix to eject the tent, a small pledget of lint or cotton laid on the cervix after the tent is introduced, will effectually prevent this accident. I have seen a great deal of suffering produced by sponge tents, and with all due deference to the dexterity of surgeons, I must insist that this is wholly unnecessary. The commercial tents, as said before, are too large, and being introduced without a speculum always induce more or less pain. My plan is this:—The

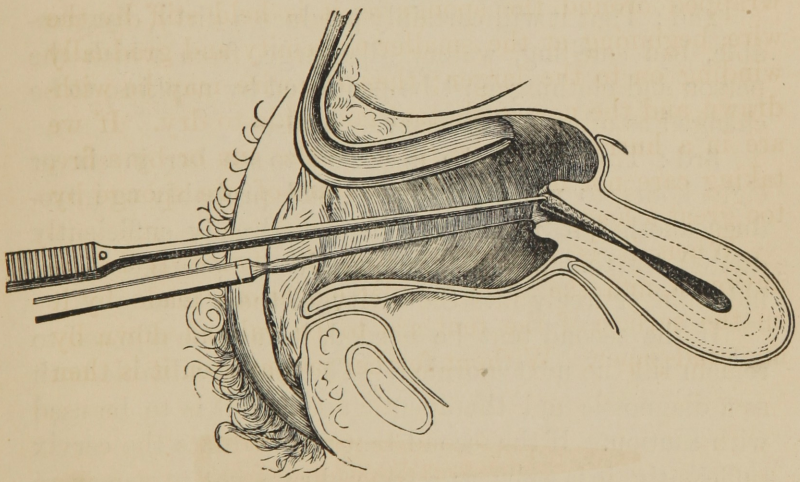

Fig. 14 represents the speculum elevating the posterior wall of the vagina; the tenaculum fixing the uterus by being hooked into its anterior lip; and the forceps holding the tent, which is introduced up to the os internum.

patient being on the left side, my speculum is introduced; the os uteri is pulled gently forwards by a delicate tenaculum hooked into the anterior lip, which fixes the uterus, while the tent held by the forceps is passed

easily and gently into the cervix to the required depth, without producing pain. I make it a point never to introduce a tent that is larger than the canal that is to receive it, and thus, if it be gently done, it is impossible to give pain; and why should we ever inflict one single unnecessary pang?

If we have the selection of the time for the introduction of the tent, let it be in the morning, say by or before ten o'clock. We should explain to the patient,—

1st: That it may possibly produce a little uneasiness, which is usually very bearable.

2nd: That it will certainly produce a dirty, disagreeable, bad smelling, watery discharge, from which the person and clothing must be protected by napkins, to be changed as often as necessary. And—

3rd: That it will be necessary to see her in six or eight hours, to remove the tent, and probably to introduce another, if the cervix be not already sufficiently dilated by the first one, to permit the passage of the index finger freely into the cavity of the uterus.

If the second tent be needed, it may be allowed to remain till the next morning. The tent is valuable both as a diagnostic and therapeutic agent, but is to be used with caution. If the second tent fail to dilate the cervix sufficiently, it is safer, as a general rule, not to persevere further for the time, but to wait a few days, and then resort to it again. I am thus cautious, because I have seen metritis follow its injudicious use. The tents of commerce have a loop of tape, three or four inches long, fastened to the large or outer extremity, for their easy removal.

I use nothing of this sort, because I always expect to remove the tent myself.

Its removal is a matter of some nicety.

Place the patient on the side as for its introduction; apply the speculum, and immediately we see the sponge projecting from the cervix and dilated from the size of *b* to that of *a* (fig. 15). It will be saturated with a

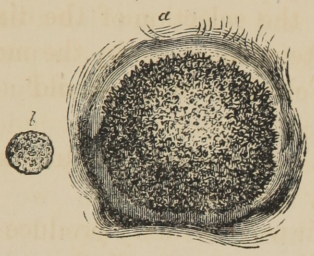

Fig. 15.

fœtid, serous, or sero-sanguinolent discharge, which is to be carefully wiped away. After this fix a pair of spring forceps firmly on the centre of the sponge, for the purpose of removing it. Then let the patient turn over on her back, with the forceps still fastened to the sponge. Now pass the left index finger into the vagina along the locked blades of the forceps, till it comes in contact with the sponge. The sponge is not to be suddenly or quickly withdrawn, but it is to be pulled gently first to one side and then to the other, taking care at the same time to support the uterus with the index finger, which is to be gently carried into the cervix by the side of the tent, first on one side, then on the other, to free its meshes or interstices from the cervical mucous membrane, which interlocks, as it were, with the substance of the sponge. When the sponge has been well loosened all round, and is found to slip down a little, then we should be ready to thrust the finger up into the cavity of the

womb, as we pull it away. If the finger does not pass at once and easily, it is better not to use much force, but, as before stated, to wait for another opportunity. The removal of the sponge is always followed by more or less flow of red blood, showing a laceration of tissue. The finger may pass the os externum with tolerable ease, and still not be able to pass the os internum, and here it is better to procrastinate a complete exploration than to use an undue degree of force. But if the second joint of the index passes the os externum, the point of the finger is already in the cavity of the uterus; and then, while we press the finger onwards and upwards we should make a counter-pressure with the right hand just above the pubes, grasping the fundus of the uterus through the parietes of the abdomen, and forcing it down on the end of the left index, as we would push a thimble down on it. Were it not for this outward counter-pressure, the uterus would necessarily be pushed upwards before the index, and we should seldom reach the fundus. There are good reasons for placing the patient on the side, and using the speculum for inspecting the sponge before its removal.

1st: It is satisfactory to know that it has remained precisely where it was placed.

2nd: It is well to see what amount of uterine or vaginal irritation it has produced.

3rd: As the sponge is saturated with a disagreeable discharge, it is well to clean it and the vagina thoroughly before the manipulations necessary for a complete uterine exploration.

All this accomplished, it is a temptation to almost any one to pull the sponge away while the patient lies on the side, with everything so nicely prepared for it

and seemingly inviting to it. But I must specially warn the surgeon against this temptation. 1st: Because if the sponge be removed under these circumstances, with the vagina widely open, the air rushes into the cavity of the uterus, and I am sure that in my early experience I had the misfortune more than once to see metritis follow this accident. 2nd: Because the finger cannot be passed far enough into the uterine cavity for a thorough exploration, unless the external counter-pressure be made with the other hand, which is neither easy nor effectual in any other position than the dorsal.

Having often to recommend the use of sponge tents, I shall necessarily be compelled to speak frequently of them in these pages, and I only regret that they are so disagreeable as remedies. I never use them if I can possibly avoid it, and I never apply them without apologizing to my patient for the very unpleasant effects they produce.

He who gives us an efficient, pleasant, and cheap substitute for sponge tents, will confer a great boon on Surgery. I know of no competent substitute, or I would be too willing to adopt it. Having said so much on this subject, we may now return to "fungoid granulations," as a source of menorrhagia.

To show not only the diagnostic value, but the wonderful therapeutic powers of the tent in such conditions, let me give a case.

Mrs. ——, of bilious nervous temperament, aged thirty-five, as a girl had occasional nervous attacks, and suffered from painful menstruation. She was married at twenty—was sterile—had yellow fever in 1853—and was compelled to leave the South, and go to New York on account of her health. She had menor-

rhagia from the time of the yellow fever, in 1853, till I saw her, four years afterwards. She was scarcely ever clear of a show for more than a week or ten days out of a month. It was not excessive on any one day, but its prolonged continuance had exhausted her strength and worn out her nervous system. She could not undergo the least fatigue—would faint easily, even from emotional causes; had tinnitus aurium and palpitation; and blindness was such a troublesome symptom, that she consulted an oculist, who told her that the condition of her eyes was wholly due to the enfeebled state of her general health. She had taken chalybeates, tonics, ergot, and sea-bathing, without improvement, and at last I saw her in September, 1857. I did not dally a moment with such general constitutional treatment as would be naturally suggested, but at once attacked the offending organ. The vagina was excessively tender to the touch from the ostium vaginæ to the cervix uteri. This was evidently the result of an ichorous sero-sanguinolent discharge that was ever present when the hæmorrhage, properly speaking, ceased. The uterus was retroverted—the posterior wall consequently hypertrophied; the os was very small; the cervix rather long and acuminated,—which anatomical peculiarities explained her symptoms previously to marriage and her subsequent sterility. From the history of the case, and from the volume and general condition of the uterus, I expected to find an intra-uterine polypus. However, the sponge tent alone would put all speculation at an end. I should have said that the irritability of the vagina was so great that I could only use the smallest or virgin-sized speculum; and I was obliged to resort to emollient vaginal injections and to glycerine applications, for a few days, to

render any speculum examination at all bearable. This done, a very small sponge tent, not more than an inch long, was passed into the cervical canal. It was worn without inconvenience for twenty-four hours. It was barely large enough to open the os uteri from the size of a No. 3 to that of a No. 8 bougie. But this was enough to permit me to look into the canal, where I could plainly see the source of the mischief. Fig. 16

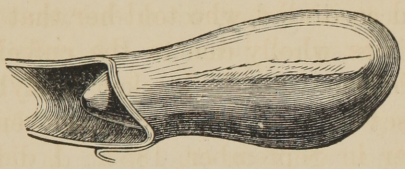

Fig. 16.

would represent the general outline and relative position of the uterus before the sponge tent was used; while fig. 17 would show a vertical section of the organ

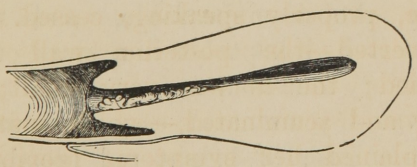

Fig. 17.

after its removal, when I could easily see the vegetations on the posterior surface of the cervical canal, as shown in the diagram. These could have been scraped away with Recamier's curette; but I was anxious to open the canal more largely and further up, into the cavity of the uterus, with a view of more easily applying the curette, and with the hope of clearing away

whatever there might be above the portion that was visible. Accordingly, I introduced a tent two inches long, and large enough to fill completely the already partially-dilated cervix. Of course it passed over the crop of fungoid granulations, pressing them firmly down into the very surface from which they sprang. I directed this lady to call again next day. Her residence was not less than five miles distant from my own.

On the succeeding day, when she was to have come to me, a furious storm prevented her going out, and, as she felt no inconvenience, except from the fetor of the sponge-tent watery discharge, she determined to remain at home. But on the next day the weather continued in the same state, it being the time of the equinox, and I did not see my patient for seventy-two hours after the introduction of the tent. I need not say how anxious I felt, for I greatly feared the consequences of its prolonged retention. When I came to examine the vagina, the stench from the sponge was almost unbearable, and the patient declared that it had kept her in a state of nausea for more than twenty-four hours.

Its removal—by no means easy—was followed by a sudden profuse gush of bright red blood. I was so much alarmed that I did not dare to resort to the curette lest I might add to the irritation already set up in the parts. But of this I satisfied myself that there were no longer any vegetations in the cervix so far as could be determined by the touch. I did not permit this lady to return home for three or four days, but detained her in New York till I was sure that she was over the dangers, if any, of the prolonged retention of the tent. No medicine was given, and nothing

more was done, but she was sent home to await the return of menstruation.

This came in due time, and lasted three days, instead of seventeen or eighteen as before, being natural in appearance and quantity. She was thus cured by the sponge tent alone in three days, and subsequently became a mother.

A sponge tent is to us a sort of necessary evil. We cannot do without it. It is not to be denied that, while it is powerful to do good, it may also be equally powerful to do harm. From a very large experience of sponge tents in uterine disease, I am now firmly convinced that we ought never to apply them, under any circumstances, in the consulting-room.

Whenever they are to be used, the patient should make up her mind to remain in-doors, if not in her bed-room, for some days, and this even when used only for a day. In hospital practice I do not remember a single mishap from them, simply because the patients did not go out and expose themselves to the vicissitudes of the weather. Whereas, after applying them in the consulting-room, I formerly had several accidents from them before I could be convinced of their noxious properties. However, with ordinary care, the tent is as safe as any remedy capable of doing good. And, since I have adopted the plan of treating private patients as I do hospital ones, by keeping them in-doors during the time of sponge tenting, I have had no cause to complain of this agent. This course was forced upon me by more than one such case as the following :—

Mrs. ——, aged thirty-four, married twelve years, the mother of three children, the youngest five years of age, always had rather profuse menstruation, but since her last labour it became very profuse, lasting ten or

twelve days, and requiring the use of six or eight napkins a day, and sometimes many more. She also had leucorrhœa. She was of plethoric habit, but began at last to feel the effects of the unnatural loss of blood. She had been treated locally and constitutionally without improvement.

The uterus, somewhat anteverted, was much larger than it should have been, and the os and cervix were granular. I, like the physician who preceded me, attempted first the cure of this condition. In the course of three months my patient was better of the leucorrhœa and granular erosion, but the menstrual flow was as profuse as ever. I then determined to explore the cavity of the uterus, expecting to find there a fibroid or polypoid growth, as the body of the organ was evidently larger than it should be. Accordingly, a small tent was introduced, and she was directed to return the next day. She did so, having suffered no inconvenience from it. It was removed, and a longer and larger one introduced, and she returned home in a stage, a distance of about four miles. This was in January, and the ground was deeply covered with snow. She came to see me the next day, saying that she was chilly the night before. She was then feverish, seemed to be quite ill, and complained of pain in the hypogastrium, nausea, &c. I removed the tent, but made no effort at uterine exploration. She returned home, had metro-peritonitis, was dangerously ill for many weeks, and, fortunately, eventually recovered, but never again to place herself under my care. Now, if I had visited this lady at her own residence, and applied the same treatment, I am very sure that she would not have had the serious illness that was evidently produced by her exposure in snow storms, two days in succession, while

she rode each day, to and fro, a distance of at least eight miles, besides the exposure of crossing the ferry to Brooklyn in a boat heated to, perhaps 80 degrees, while the temperature outside was not more than 20° F. During this same winter ('58) I had two or three other cases similarly unfortunate. I then resolved not to use sponge tents again on riding or walking patients, and since then I do not remember an accident from them—and this is saying a great deal in favour of their innocuousness. However, I use them now with greater caution—for instance, when I knew less about them than I do now, I invariably allowed a tent to remain twenty-four hours; on its removal a second was usually introduced to be worn another twenty-four hours; sometimes a third was introduced for another twenty-four hours; but generally, indeed almost always, I subjected the uterus to this treatment for at least forty-eight hours. Whereas now, as I have already described (page 50), the whole process should not occupy more than from twelve to twenty-four hours at any one time.

The power of the sponge tent to modify the uterine surfaces with which it lies in contact is truly wonderful. It dilates the neck of the womb; it softens it by pressure, and by a sort of serous depletion; it reduces the size, not only of the neck, but of the body of a moderately hypertrophied uterus; it destroys not only fungoid granulations, but even large mucous polypi; and in one instance I saw a sponge tent destroy wholly a fibrous polypus as large as a pigeon's egg.

This was accidental, but it demonstrated clearly what the sponge can do by pressure and capillary drainage.

When introduced into the cervix, the tent soon absorbs moisture, and expands. It may produce a little pain, but it is of no moment, and ceases ordinarily

when the dirty serous or sero-sanguinolent discharge begins. The meshes of the sponge and the surface with which they are in contact become, after some hours, intimately incorporated. The sponge forces itself into the very structure of the cervix, and the mucous membrane of the cervix shoots out into the interstices of the sponge, so that it is somewhat difficult to separate the two if the tent has been worn for any length of time. On its removal, there is necessarily a laceration of the tissue incorporated with it. This lacerated surface generally heals smoothly over in a few days after, obliterating every trace of the original indolent fungoid growth that gave rise to the menorrhagia. Thus, it seems to perform the duties of M. Recamier's curette in a most efficient manner, but I do not pretend that it would always supersede it.

The curette is simply the adjuvant of the tent, and always to be preceded by it. But there are cases where their relationship is changed, the sponge becoming the adjuvant of the curette, and this is when the fungoid granulations are at the fundus uteri. Then the sponge is to dilate the cervix for the more easy application of the curette.

In cases of menorrhagia that resisted all other treatment, Recamier passed his curette into the uterine cavity, and raked it out as thoroughly as possible. This was before the days of sponge tents. But now we first dilate the cervix, pass the finger into the cavity, ascertain precisely the seat of the fungoid growth, pass the curette by the side of the finger, and thus operate more understandingly.

Fig. 18 represents the curette that I use; the handle is malleable and may be bent laterally, or backwards, or forwards, in the direction of the dotted

lines, *a*, *b*. Thus it can be used with equal facility on any portion of the uterine cavity. I have lately had it made with a ball and socket joint, in the middle of the shaft, but the simple instrument, as here delineated answers quite as well.

FIG. 18.

To show the power of the sponge to destroy mucous polypi, I will select one, and only one, of many cases that I might bring forward.

In November, 1862, I was consulted by a lady in Paris, who was seemingly a perfect specimen of health, but she was sterile. Menstruation had always been rather profuse, lasting eight or nine days.

The uterus was retroverted, but what would seem contradictory, it was also anteflected. Suffice it for the present to say, that the cervical canal was enlarged by a bilateral incision. The operation was performed in December, 1862, with the assistance of Sir Joseph Olliffe.

The parts as usual healed before the next menstruation, which, however, was not much influenced by the operation, for it went its usual course of eight or nine days. After it was over I was examining the condition of the cervical canal, and to my surprise, I saw the end of a mucous polypus or enlarged nabothian gland lying high up in the canal, as shown at *a*, in fig. 19. I passed a sponge tent in the morning along the canal of the cervix, above and beyond the seat of the polypus. In the afternoon I removed the tent and

introduced a longer and larger one, and allowed it to remain till the next morning. On its removal there was no trace of the polypus to be found. Menstruation

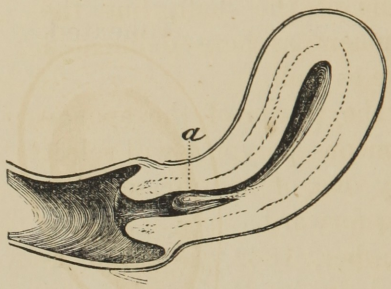

Fig. 19.

immediately became normal, and has continued so ever since.

This power of the sponge tent to destroy polypoid growths was accidentally discovered at the Woman's Hospital in this way. In 1856 a young unmarried woman entered the hospital with a menorrhagia that had bled her quite into a dropsical condition. The flow was almost continuous, but attended with no great degree of pain; she was perfectly anæmic from loss of blood; had general anasarca, and was of a waxy hue. We did not suspect the true character of her disease; and Dr. Emmet and myself agreed to give her a nutritious diet, with chalybeates; and so she went on bleeding for several days longer, and a sponge tent was then introduced. The uterus did not seem to the touch to be much enlarged, and it was only two inches and a half to the fundus. The cervix was small, and the os was correspondingly so. When the tent was removed there presented one of the most perfect specimens of fibroid polypi that I ever saw. The

diagram (fig. 20) shows its attachment and relations.

It had given me much trouble, and was a nice case for operation, which might have been performed at the

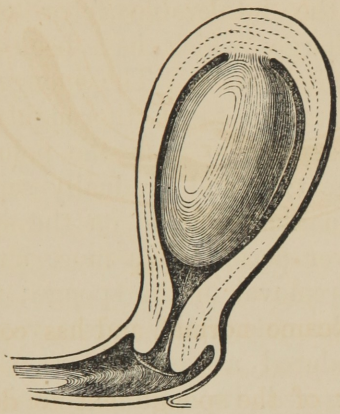

Fig. 20.

moment, but I was anxious to show it to the Consulting Board of the Woman's Hospital, and concluded to put off its removal till the next day, which was the day for their regular meeting. Accordingly I introduced a large sponge tent, expecting to remove it on the following day, and complete the operation in the presence of the Board. Singularly, they did not meet, and the poor patient with the sponge tent was completely forgotten. I expected Dr. Emmet to remove the tent, and he thought I had done it; and the nurse, who, by the by, never forgot a patient, supposed we had left it intentionally. However, about a week afterwards, the nurse begged to call my attention to the young woman with the sponge tent, saying she thought "it must be rotten by this time, as the other

patients in the same ward with her could not stand the smell of it any longer." My mortification at such neglect, added to the dread of serious results to the poor patient, may well be imagined. However, she was soon on the operating table, complaining of nothing but the intolerable fetor of the sero-sanguinolent discharge, which had been going on constantly for a whole week. The sponge and the tissue of the cervix seemed to be thoroughly amalgamated, and it was necessary to push the point of the finger up between the two, and gradually separate them all round before making traction on the sponge with the forceps. I never performed a more unpleasant operation than the removal of the sponge; the stench was such as to make one of the nurses vomit. When the tent was introduced a week before, the tumour was accurately measured, its volume, density, and attachment all definitely settled, and easily so. It was a dense, firm, fibrous polypus, about the shape of the diagram on page 63—a little larger, and having attachment to the fundus as there represented. My surprise may be imagined when, on introducing the finger into the cavity of the uterus, after the removal of the tent, there was not a vestige of the tumour to be found. The pressure and drainage by the sponge had eradicated it entirely. The patient speedily recovered, and was soon restored to a vigorous state of health. Notwithstanding the happy result of this accident, and the valuable principle thereby established, I would not recommend it as a rule of practice in fibroid polypi. For the danger of metritis by the prolonged contact of such an irritant, and the still greater danger of pyæmia from the disintegration of tissue, would render it too hazardous. However, the tent may always be trusted to

destroy fungoid growths and small mucous, or nabothian polypi, when they cannot be otherwise removed. Dr. Emmet, surgeon to the Woman's Hospital, whose experience with the sponge tent is very large, has the greatest confidence in their safety as well as efficiency. I have seen him repeat them day after day, and I have often heard him say that he has succeeded in doing more for general hypertrophy of the uterus by this means in a week than could be accomplished by any and all others in two or three months.

I have said a good deal about the disgusting discharge produced by the sponge tent. While at Baden-Baden in the summer of 1863, I had occasion to use a tent, and apologized to my patient for its bad effects. In her case I had been previously using glycerine dressings to the womb. As the tent showed a little disposition to slip down, I applied a pledget of cotton, saturated with Price's glycerine, over the neck of the uterus, simply because it was convenient to do so. When I went to remove the sponge in the afternoon, my patient told me that the discharge had no bad odour, and, on examination, I found the pledget of cotton and tent, after removal, perfectly devoid of any fetor. I have now often used this as a disinfectant of the sponge, and find it infallible in its results. The only objection to it is that it sometimes prevents the sponge from expanding to its fullest extent.

I have used tents of the Laminaria digitata, and think well of them, but they can never wholly replace the sponge tent. There is much trouble in retaining them properly in place. It is often necessary to prop them up with a tampon, and even then they slip out. Besides this, they require a much longer time to dilate the cervix. However, they are a valuable addition to

our surgical resources, and for them we are greatly indebted to the late Dr. Sloan,* of Ayr, Scotland.

Dr. Greenhalgh has improved the Sea Tangle tent very much, and it happened in this way. He had some trouble in getting a pair of forceps made specially for their introduction, and the idea occurred to him to perforate the lower end of the tent for the insertion of a stylet, which answered a good purpose. But he soon discovered that the perforated part dilated more easily and to a greater degree than the rest of it. He then had the perforation made through the whole length of the tent, when he found that it acted more rapidly and more efficiently than before. The tents of commerce up to this time were tied round with a thread at the lower end to facilitate their removal. This interfered with the dilatation, by preventing the expansion of the tubular perforation below. He then had the thread fastened to one side of the tent as shown in the diagram (fig. 21). I agree entirely with Dr. Greenhalgh that the tent should not, as a rule, exceed two inches in length.

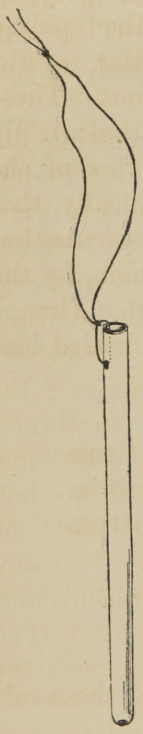

Fig. 21.

Prepared after Dr. Greenhalgh's plan, it is much softer when removed from the uterus than the solid tent, and the perforation is found of be dilated in proportion to the expansion of the solid part, thus serving as a drain to facilitate the escape of any secretions from the cavity

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* *Glasgow Medical Journal*, October, 1862.

of the uterus. Notwithstanding all this, I regret to say they do not fulfil all the indications of the sponge tent, and cannot wholly replace it.

Of Menorrhagia from Polypus.—Having spoken of menorrhagia as a sequence of granular erosion, of cervical engorgement, and of fungoid granulations, we now come to consider it as a concomitant of polypus. Accoucheurs and pathologists have described polypi as soft, hard, mucous, glandular, cellular, cystic, fibrinous, fibro-cellular, fibro-cystic, and fibrous. These several divisions are anatomically and pathologically correct; but as I am taking only a surgical view of the subject, I prefer to classify them topographically, that is, not according to their own structural elements, but simply according to their point of origin, which, by the bye, is the simplest method of arrangement. Thus, I would say that uterine polypi are naturally divided into three classes:—

1st. Those growing from or about the os tincæ.
2nd. Those growing in the canal of the cervix.
3rd. Those growing in the cavity of the uterus.

The first may be fibro-cellular or mucous.
The second are almost always mucous.
The third are almost always fibrous.

I propose to give clinical illustrations of these subdivisions.

In the first class they may be large or small. If of the fibro-cellular variety, they may attain an enormous size. I have seen them almost as large as the fœtal head at term. If of the mucous variety, they seldom grow larger than an English walnut, and are usually somewhat flattened by pressure between the cervix and

the opposite wall of the vagina. To the sight these seem to be only a congeries of fibro-cellular tissue and blood-vessels. Polypi growing from the os tincæ are generally attached to one lip of it. I am not able to say upon which one they are most frequently found. They often prevent conception, but not always, for our medical literature contains numerous examples of labour complicated with, or obstructed by, very large polypi, which could hardly have grown during the period of gestation.

Their removal is easy enough. They may be cut off with scissors, or removed by the écraseur. I know that fatal hamorrhage has followed the use of scissors, but it was before the discovery of the styptic properties of the perchloride of iron by Pravaz. This was indeed a boon to surgery, and Deleau* has rendered a great service in vulgarizing its use.

But, unfortunately, it is a remedy of uncertain properties. It often contains free acid, and then it irritates the mucous surface of the vagina. So uncertain is this preparation in New York, that the profession there have almost entirely abandoned its use, substituting for it the solution of the persulphate of iron (as made by Dr. Squibb, of New York), which seems to be quite as efficient and is not so liable to the same objections. In Paris I could not get the persulphate of iron, and I was obliged to return to the use of the perchloride as a styptic. Mr. Swann, chemist, Rue Castiglione, procured for me specimens of the perchloride which purported to be neutral, but

* "Traité Pratique sur les Applications du Perchlorure de Fer en Médecine." Par M. T. Deleau, Docteur en Médecine, &c. Paris: Adrian Delahaye. 1860.

they produced very deleterious effects on the vaginal epithelium, and at last he got some of Deleau's, and its effects were as desired, viz. styptic and unirritating.

We will suppose a polypus growing from the posterior lip of the os tincæ, with a pedicle half an inch, more or less, in diameter (fig. 22). If it is to

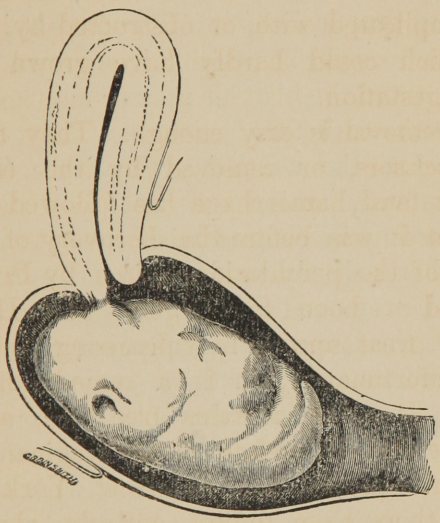

Fig. 22.

be removed by scissors, first prepare the styptic by mixing one part of the solution of the perchloride of iron, with three or four of distilled water; then saturate pledgets of lint in it, or, what is better, take some fine cotton wool, wet it thoroughly in plain water, squeeze all the water out, and then wet it in the mixture, and squeeze it nearly dry.

When all is ready, place the patient in the semi-prone position, apply the speculum, lay hold of the tumour with forceps, or a vulsellum, draw it gently forwards, and cut it off at one stroke with suitable

scissors. Sponge the cut surface a moment, and quickly apply the lint or cotton previously prepared, and press it firmly in place with a sponge probang (fig. 23). The firm pressure of one or two sponge probangs on the styptic lint or cotton almost instantly checks the bleeding. Wait a little to be sure of this, and then put a tampon of dry cotton over all, merely to secure the dressing proper *in situ*. The patient is put to bed, the recumbent position is enjoined for a day or two, and the bladder may or may not be emptied by the catheter.

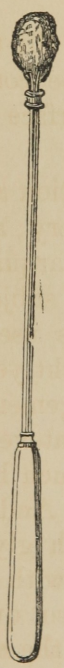

Fig. 23.

On the next day the dry cotton is to be removed, taking care not to disturb the iron dressing in contact with the cut surface. This adheres closely to it, and is not, as a general rule, to be removed till it is loosened and thrown off by the suppurating process, which takes two, three, or even four days.

But, when the dry cotton is removed on the day after the operation, its place is to be supplied by a bit of cotton saturated with Price's glycerine, which is to be renewed daily, till the cut surface be healed. For this purpose take some fine cotton, as much as can be easily held in the hollow of the hand, immerse it in tepid water, and squeeze it gently under the water till it becomes perfectly wet; then press all the water out of it, and saturate it with Price's glycerine. To do this, lay the moistened cotton in the palm of the left hand, spread it out circularly for an inch and a half in diameter, more or less as may be needed, scooping it out in the centre—then drop half a teaspoonful of glycerine on it thus held, and rub it into the cotton with the point of the finger, then pour on a little more gly-

cerine, and rub it in, and so continue till the cotton becomes saturated. When finished, the cotton should feel soft and pulpy, should be about an inch and a half in diameter, and about half an inch thick.

This dressing is an expensive one, for it will hold from one to three drachms of glycerine; but I do not think there is any substitute for it, and its effects are such that I consider it cheap in the end.

This glycerole cotton is thus applied daily till the first dressing is removed, and then it may be continued for a few days longer, till the whole surface be healed.

Glycerine is now fixed in professional estimation as a most valuable addendum to the domain of surgery; and to the philosophic and practical mind of Demarquay* are we indebted for a complete treatise on the subject, setting forth its properties and qualities. Its use in uterine surgery occurred to me some seven or eight years ago, in this way:—To a case of granular engorgement I wished to apply some caustic or other; but, whatever it was, I could not at once find it. Being very much hurried, I looked around for some substitute. And it occurred to me to apply a bit of cotton wet with glycerine, merely to protect the os uteri from contact with the opposite surface of the vagina, which was also quite granular. I fully intended to use the caustic on the next day. But, when my patient returned, she saluted me with, "Well! doctor, what effect did you intend the treatment of yesterday to produce?" Seeing that there was evidently something out of the way, I was quite at

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* "De la Glycerine," &c. Par M. Demarquay. Paris. 1863.

a loss for a satisfactory reply; and she continued, "You ought to have told me all about it, for, when I got home, my linen was so wet that I had to change it, and the water streamed from me all night in such a way that I have had to wear napkins to protect myself." This was all news to me, and, on examination, I found the pledget of cotton still wet, lying just as it was placed on the cervix uteri, which, together with the vagina, had a clean, healthy, and greatly improved appearance, compared with what it had the day before. I applied another similar dressing, to see if it would produce the same effect. It did, and these dressings were repeated till the case was entirely cured: since which time I have used glycerine in this way in all my surgical operations on the neck of the womb, and in other cases of organic lesion.

The effect of glycerine thus used is very remarkable. It has great affinity for water. A bit of cotton saturated with glycerine, and exposed to the air, will retain moisture for weeks. When applied to the neck of the womb as above directed, it seems to set up a capillary drainage by osmosis, producing a copious watery discharge, depleting the tissues with which it lies in contact, and giving them a dry, clean, and healthy appearance. When such a dressing is applied to a pyogenic surface on the cervix uteri, for a few hours, and then removed, the cut or sore will be as clear of pus as if it were just washed and wiped dry.

Much has been written on the diagnosis of polypous tumours. I do not intend to open the subject here, but I would only say that the Gordian knot is easily cut, if my method of exploration be adopted; for, with the patient on the side (or knees, if necessary), with my speculum everything is brought so plainly

into view that there is no possibility of making a mistake.

Dr. Graily Hewitt and Dr. Greenhalgh have related cases where physicians were in doubt, and had even mistaken a common polypus for carcinoma. I have seen several cases of mucous polypi slightly protruding from the cervix that had been treated for granular erosion by repeated applications of nitrate of silver; and a few years ago I saw a woman, forty-eight years of age, greatly reduced by prolonged hæmorrhages, who presented almost exactly the cachectic physiognomy of carcinoma. She had none of the lancinating pains of

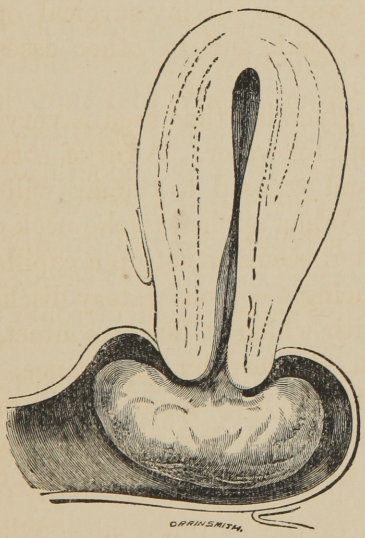

Fig. 24.

cancer, but when the finger was passed into the vagina, it found a knobby hard growth occupying the place of the cervix, and the os could not be felt.

When the ordinary speculum was used, this growth

filled up its area, and all was in doubt. But, by the use of my speculum, which left the whole vagina freely open to inspection, we found a polypus of mushroom shape fitting almost like a cap over the cervix uteri (fig. 24). The pedicle was short, and the tumour fitted so well the projecting portion of the cervix, that it was scarcely movable. The removal of the tumour with scissors exhibited an os tincæ perfectly free from all appearance of malignant disease. A not unfrequent form of polypus is represented by fig. 25. This was removed from a lady who supposed it was the womb coming out, because it protruded from the mouth of the vagina. When I told her it was a fibro-cellular polypus, she was greatly alarmed, because she had lost one of her servants by an operation of some sort for polypus.

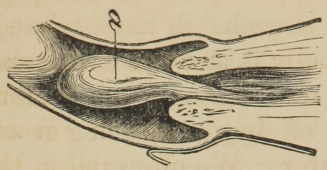

FIG. 25.

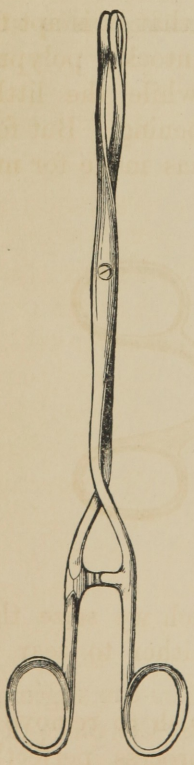

FIG. 26.

All classifications are more or less arbitrary. This polypus might by some be classed in my second subdivision; but as it grew distinctly from the edge of the os tincæ, although some of its fibres took root in the cervical mucous membrane, I have put it in the first class.

We often find small polypi in the canal of the cervix. They vary from

the size of a grain of wheat to that of a small bean, and are called nabothian polypi. (See fig. 19, page 62.)

They may be very effectually destroyed by the mechanical pressure of a sponge tent worn for twenty-four hours, or they may be pulled off by forceps, or cut off with scissors; I prefer the latter. We often fail in the extraction of small mucous or cystic polypi, for the want of a suitable instrument.

Dr. McClintock uses a fenestrated forceps for these, which answers admirably. A vulsellum is not suitable here, because their tissue is so delicate that it is apt to tear out. Fig. 26 represents Dr. McClintock's polypus forceps. They compress the pedicle, while the little polypus lies unhurt in the fenestral opening. But for larger ones, such as fig. 25, Charrière has made for me

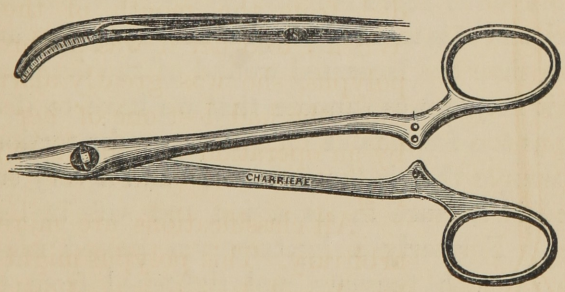

Fig. 27.

forceps of this sort (fig. 27), with which we seize the pedicle of the polyp, when we wish either to tear it away or cut it off with scissors.

But suppose, for some reason, we wish to remove a polypus by torsion. To render this process perfectly safe, it is necessary that the pedicle be long and slender,

and that the tumour be easily rotated. This process has been applied to the small nabothian polypi and also to intra-uterine fibrous polypi with slight attachments. Laying hold of the polypus with a fenestrated forceps, if of the first variety; with a vulsellum, if of the second; we rotate gently from left to right, and so continue till all resistance ceases, when we remove the severed growth. I am no advocate for this plan, unless under very exceptional circumstances.

There are but few polypi that cannot be safely removed with scissors, yet we may have reasons for not wishing to resort to them. The patient may be so exhausted by repeated and prolonged hæmorrhages, that we cannot afford to risk the sudden loss of an additional small quantity of blood; or from some theoretical grounds we may prefer not to cut. For instance, in Paris, surgeons often refuse to perform the simplest cutting operation when there is much erysipelas about, asserting that a clean cut is more apt to produce erysipelas, and even pyæmia, than the lacerated wound of the écraseur. Be this as it may, let us suppose that we have to deal with a polypus too formidable for scissors or for torsion. Our only resource then is the écraseur,—and a very sure and safe one is it: sure in its action and safe in its consequences. Formerly a ligature was passed round the pedicle of such tumours, and tightened from time to time till the mass sloughed away; but that day has gone by, never to return.

The removal of a polypus by ligation is really a dangerous operation, resulting not unfrequently in pyæmia and death, which seldom indeed happens when the écraseur is used.

We owe this admirable instrument to the inventive genius of Chassaignac.

It has been used in almost every imaginable way, and often most inappropriately; for instance, for fistula in ano, for the removal of simple steatomatous tumours, for excision of the mamma, for lithotomy, and even for amputation of the thigh. But the time is coming, indeed is even here, when the true surgeon will raise it to the dignified position that it merits, by confining it to such operations as are peculiarly its own. For the ablation of diseased structure in erectile tissue it cannot be over-estimated. In Chassaignac's ward in the Larriboisière Hospital I have seen cases where malignant disease of the tongue called for the removal of that organ, which was done safely by this admirable instrument, and the patients remained well for a long time afterwards. In the same wards I have seen more than one case in which M. Chassaignac had removed the anus, and a large portion of the rectum, for cancerous disease, an operation that would have been utterly impossible by any other means, and one of these patients had been well for more than a year.

These are, fortunately, rare cases, but they prove the value, efficiency, and safety, of the écraseur under the worst possible conditions. But it is for the removal of hæmorrhoids and uterine polypi that this instrument is to find its most common and appropriate field of usefulness.

Many modifications have been made of Chassaignac's chain écraseur. M. Maisonneuve uses a stiff but malleable iron wire, to be pulled through the tissue. Dr. Braxton Hicks makes a cord of several fine threads of wire; while others fix one end of the chain (Charrière and Tieman). I have tried all these, and have no hesitation in saying that none of them are in practice equal to Chassaignac's original instrument, It generally cuts

through neatly, without drawing out long shreds of tissue, leaving us uncertain when the tumour is entirely severed, if it be hidden from view, as it must be sometimes. Every little click of Chassaignac's instrument measures for us most accurately the distance over which the chain passes, warning us to rest. The resistance we encounter in tightening it shows us the density of tissue, and is the index to move slower or faster. Whereas, every turn of a screw, whether a quarter, half, or whole revolution, leaves us in doubt whether it is too much or too little—while it is a power unmeasured and unappreciated by the sense of feeling. This is strongly proven by the fact that I have never broken one of Chassaignac's instruments, while I have broken two worked by a screw. The same thing has occurred in the dexterous hands of Dr Graily Hewitt and of Dr. McClintock.

McClintock, in speaking of the écraseur for uterine polypi, says, "I have generally felt it necessary to bring the bulk of the tumour beyond the external genital orifice; and this necessity it is that limits its range of applicability."* The difficulty of placing the chain around the pedicle of the tumour while in the vagina, and the still greater one of applying it within the uterus, has been heretofore the great barrier to its universal adoption. But I hope this difficulty is now overcome. I do not think the polypus should ever be drawn outside for écrasement, or that there should be any undue traction made on the uterus while the écraseur is being worked. My plan is this. The patient in proper position, the speculum (fig. 5) is introduced, and we have a complete view of everything in the vagina. If the

* "Clinical Memoirs," &c., p. 171.

tumour is in the vagina, there will not be the least difficulty in applying the chain of the écraseur; but, to do this with facility, it is necessary to prevent the chain from folding on itself, as we attempt to carry its loop over and beyond the tumour. This was to me a source of annoyance for a long time, but at last I have succeeded in giving the chain a rigid fixity that makes it very easy to do this.

Where the polypus has descended into the vagina, Maisonneuve's wire, or Dr. Braxton Hicks' cord of wire, answers very well; but where it is intra-uterine, with a contracted cervix, we ordinarily fail in their application, just as we do with the chain of Chassaignac.

I have added to Chassaignac's instrument a porte-chaine, which may be described as a pair of dilating forceps with spring blades, which render the chain stiff, so that it may be passed straight into the vagina, or into the cavity of the uterus, as easily as we would a sound or a sponge probang. After which the chain is expanded by the blades of this porte-chaine.

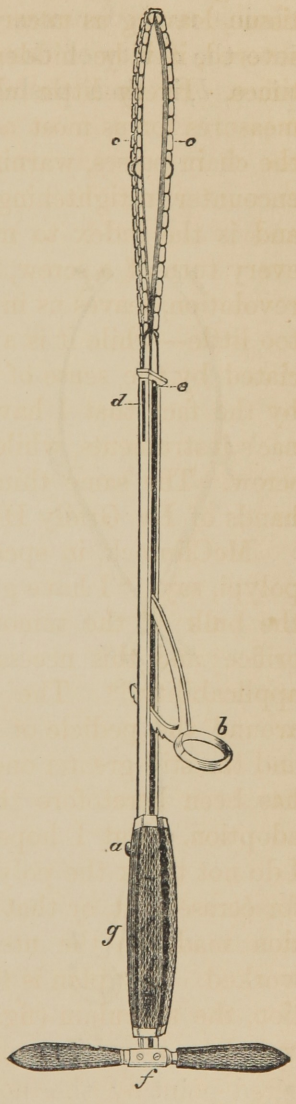

Fig. 28.

Fig. 28 represents the écraseur with the porte-chaine ready for use. It is carried into the vagina or into the cavity of the womb thus arranged; the thumb-piece, *b*, is then pushed forward and fastened at the de-

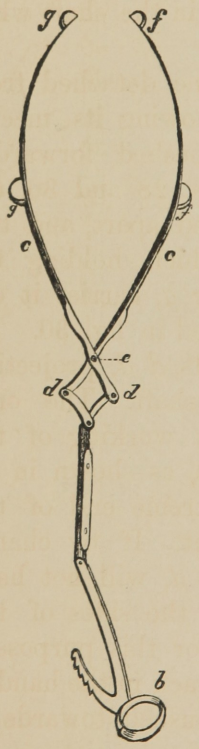

Fig. 29.

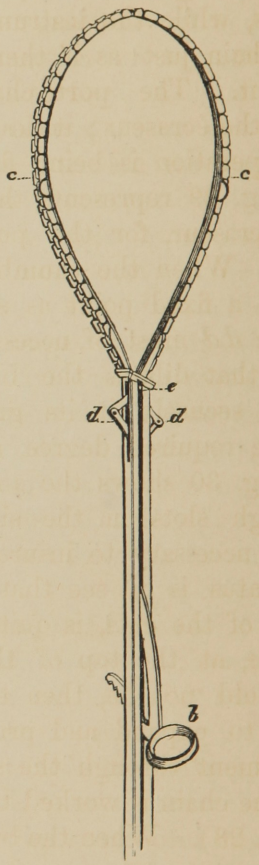

Fig. 30.

sired point by the notched rack, which is seen passing through the shaft of the instrument; this movement dilates the spring blades of the porte-chaine, and ex-

pands the chain to the required extent. When the chain is made to encircle the pedicle of the tumour, the porte-chaine is drawn up into the shaft of the instrument simply by elevating the thumb-piece, *b*, and pulling it back in a straight line for three or four inches, while the instrument is pushed forward along the chain just as if there had been no porte-chaine present. The porte-chaine is not wholly removed from the écraseur; it lies in its place in the shaft while the operation is being finished.*

Fig. 29 represents the porte-chaine detached from the écraseur, for the purpose of showing its mechanism. When the thumb-piece *b* is pushed forward, *e* being a fixed point as shown in figs. 28 and 30, the joints *d d* must of necessity be forced apart, and this it is that dilates the blades *c c*, which, holding the chain securely in its grooves *f f*, *g g*, carries it out to the required degree, as represented in fig. 30.

Fig. 30 shows the angles or joints, *d d*, projecting through slots in the sides of the shaft. The only thing necessary to insure the perfect working of the apparatus is to see that the pivot *e*, as shown in all three of the cuts, is quite at the extreme end of the groove, at the top of the instrument. If by chance it should not be, then the joints, *d d*, will not have room to expand and project out of the sides of the instrument through the slots made for this purpose.

The chain is worked by a hidden rack in the handle, *g* (fig. 28). When the button, *a*, is pushed towards *d*,

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* The mechanism of this instrument has been greatly simplified since I presented it to the Obstetrical Society in December, 1864, and published an account of it in the *Lancet*. For this improvement I am indebted to Mr. J. Mayer, instrument-maker, 51 Great Portland Street.

the teeth of the rack are caught by the notches in the sides of the two long shafts that run from *f* through the whole length of the instrument; when it is moved towards *d*, then its teeth are elevated out of these notches, and the chain and porte-chaine can be freely pushed up and down the shaft like the piston-rod of a syringe. This part of its mechanism is exactly the same as that of Chassaignac's instrument, except that it is simplified, hidden from view, and not in the way of the operator.

Let me illustrate the principle of its application by a clinical observation. In February, 1863, Dr. Morpain, of Paris, invited me to operate on a patient of his, who had a polypus as large as a goose's egg projecting partly from the cavity of the uterus.

Fig. 31 represents its position, relations, and attachment. A moment's glance shows the difficulty of passing a chain around the pedicle of a tumour thus

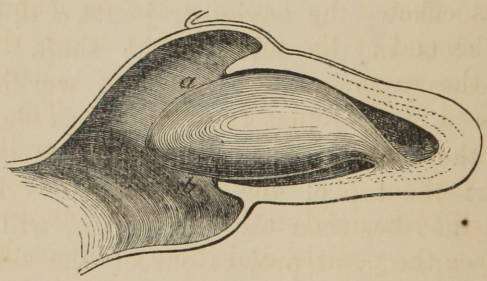

Fig. 31.

situated. The patient, on a table, was placed in the left lateral semi-prone position, and, when the speculum was introduced, it elevated the perineum and posterior wall of the vagina, and brought completely into view the tumour, as represented in the engraving.

There is great temptation under such circumstances

to seize the projecting portion of the polypus with a strong vulsellum or tenaculum, and pull it towards the os externum. But this is not the best thing to do, because it will close up the mouth of the vagina and obstruct both sight and manipulation ; for the mouth of the vagina, even in favourable cases, would hardly be forced open more than an inch and a half from the urethra back to the perineum, and we need all this space for operating.

Here a small tenaculum was hooked into the tumour at *a*, and by it the polypus was pushed gently downwards and forwards against the anterior wall of the vagina. It was held firmly, while the stiffened chain of the écraseur was passed along the upper or posterior surface of the tumour from *a* up to the fundus uteri at *c*. This done, the tenaculum was removed, and the chain of the écraseur opened out in the cavity of the uterus to a sufficient extent to allow the tumour to pass through it. This was effected by hooking the tenaculum at *b*, and raising the end of the tumour up towards the posterior wall of the vagina, at the same time that the écraseur was pressed in the opposite direction. This movement placed the middle portion of the chain parallel with the anterior face of the tumour, while its loop, or distal portion, still remained stationary at *c*. It was thus made to embrace the pedicle, and it only remained to pull the porte-chaine back at the same moment that the shaft of the instrument was pushed down on the chain, which was tightened closely around the pedicle. The operation was then finished as easily as if the tumour had been wholly outside the body, and that, too, without the least strain or traction on the uterus or surrounding organs.

This operation was done with the assistance of Dr.

Morpain, Sir Joseph Olliffe, and Dr. W. E. Johnston. Since then (February, 1863) I have had every reason to feel satisfied with the porte-chaine, whether the polypus was in the uterus or simply in the vagina.

When I was in Dublin, in August, 1861, Dr. M'Clintock asked me to see a young woman in the Rotunda Hospital who had an intra-uterine polypus. It was about the size of a pullet's egg, and entirely within the cavity of the uterus (fig. 32). She was a virgin; the vagina was of course small, and

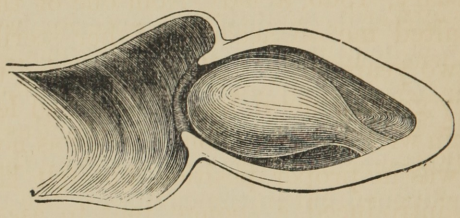

Fig. 32.

the mouth of it quite contracted; thus any manipulation was difficult. We succeeded, however, in getting a rope of wire on the tumour two or three times, and succeeded as often in breaking it; and thus, for the want of proper machinery, we were compelled to let the case alone for the time being. If we had then had the Chassaignac instrument with the porte-chaine, there would have been comparatively little difficulty in removing the tumour at once.

Intra-uterine polypi grow from the fundus, or from the anterior or posterior walls of the uterus, but more frequently from the anterior. I do not remember to have removed any with simply a lateral attachment. It has so happened that I have seen more polypi attached to the anterior than to the posterior face of the uterine

cavity. If observation should establish this as a rule, it will be very fortunate in a surgical point of view; for it is much easier to pass the chain of the écraseur around the pedicle of a polypus attached anteriorly than posteriorly, if it be entirely intra-uterine. An example of each variety may serve for clinical illustration. Dr. Morpain's case already related is a fair specimen of one variety; but, as showing the improved methods of modern surgery, I may be permitted to allude briefly to another similar case.

In February, 1860, a lady from one of the eastern States consulted me on account of her sterility. She was thirty-two years old; had been married ten years; enjoyed very good general health, and had leucorrhœa and some pain with menstruation, which was not profuse. The uterus was in proper position, but felt larger than natural. I introduced a sponge tent to ascertain the cause of this hypertrophic state. On its removal, the finger passed into the cavity of the uterus detected a

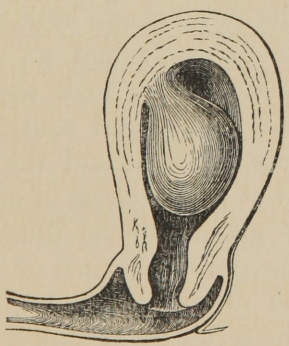

Fig. 33.

fibrous polypus of the size of a partridge's egg, attached anteriorly, as represented in fig. 33. Another sponge tent of larger size was introduced, and on its removal

six or eight hours afterwards, I succeeded in passing the chain of the écraseur around the pedicle, when it was easily and quickly severed. This case strongly illustrates the present improved methods of exploration ; for here we could not have determined the cause of the uterine enlargement but by passing the finger into the cavity of the organ after dilatation of the cervix. Indeed, before the use of sponge tents we could not by any possibility have diagnosed such a case as this. But now we determine with the minutest accuracy, not only the presence, but the size, position, relations, and attachment of all such tumours. Before the use of sponge tents, if we suspected from rational symptoms an intra-uterine polypus, we could only wait from month to month—sometimes from year to year—for it to grow and to force its way into the vagina, before we could interfere surgically for its removal. But now we no longer doubt and procrastinate ; we no longer let our patients bleed till they become bloodless and dropsical ; but we ferret out at once the source of mischief, and remove it from its once secure hiding-place. This is a great advance in surgery ; and no man of twenty or thirty years' experience can look back on the days of ergot and Gooch's canula, and contrast them with the present time of sponge tents and the écraseur, without a thrill of delight at the progress of our noble calling.

Having now given clinical illustrations of polypi growing from the os, in the canal of the cervix, and in the cavity of the uterus attached to the anterior wall, I will continue the series by examples of polypi growing from the fundus and the posterior wall. As said before, I do not remember any with a simple lateral attachment.

A. H., aged twenty-six, gave birth to her only child

when she was but fourteen. Had two or three miscarriages since, at about the third month. Had menorrhagia for many years, very profuse, painful, and coagulated, lasting usually ten or twelve days. Had forcing pains during the whole time of the flow, and, singularly enough, they were always worse in the forenoon. This patient was sent to the Woman's Hospital by Professor J. C. Nott, of Mobile. The womb was in its normal position, and evidently enlarged. The os admitted the end of the index finger to the depth of the nail. She had just menstruated, and there was a very profuse muco-purulent discharge from the cavity of the uterus. For years her suffering had been a mystery. A sponge tent unravelled it in a few hours. She had a fibroid polypus attached to the fundus by a short, thick pedicle (fig. 34). It was impossible to place the chain

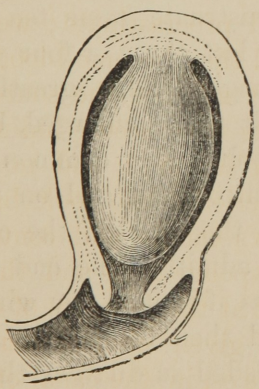

Fig. 34.

of the écraseur around it, through a comparatively contracted cervical canal. This was before we had learned the use of wire as a substitute for the chain. With a Gooch's canula I put a strong fishing-line around the

pedicle, and severed it with the screw écraseur. It was difficult to get a cord strong enough to cut through its fibrous tissue. It snapped a large catgut guitar-string, and then a silk cord. With Chassaignac's écraseur, armed with a porte-chaine, there would have been no trouble.

So far I have spoken only of successful operations; but there is such a thing as failure, and even death, in consequence. Fortunately, these are rare. I have removed a great many intra-uterine polypi, and all without accident, except in two instances, which were followed by pyæmia. One of these recovered, the other died. This latter was an example of polypus with attachment to the posterior wall by a thick, short pedicle. It was the case of a lady about sixty years old. I was invited to see her by Professor Metcalfe, of New York. She was the mother of a large family of grown-up children; had ceased to menstruate some ten or twelve years before, but for the last three or four years had suffered alarming hæmorrhages, which greatly prostrated her. The uterus was felt to be enlarged, but the os was not larger than the point of a common probe. A small sponge tent was introduced, and on the next a larger one. This dilated the canal of the cervix sufficiently, but the os barely admitted the end of the finger, and felt as inelastic as if bound by wire. Of course, no further effort could then be made. Eight or ten days after this we succeeded in dilating the cervix, so as to explore most satisfactorily the cavity of the uterus, when we found a hard fibrous polypus, with a broad, thick pedicle, attacked to the posterior wall, close to the fundus (fig. 35). This was in May, 1862. I failed to put the chain around the pedicle. Two weeks afterwards another series of sponge tents was followed by another

failure. The tumour was unfortunately lacerated a good deal by the vulsellum, which was used to draw it downwards and to fix it while efforts were made to pass the chain around it. Two or three days after this a

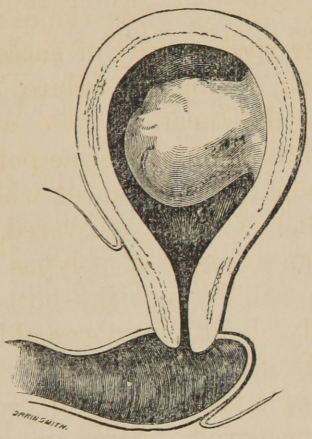

Fig. 35.

chill ushered in an irritative fever, which unhappily terminated fatally. Here a valuable life was lost because our art did not furnish the proper surgical appliances for relief. With the écraseur, as now supplied with the porte-chaine, there is every reason to believe that we would have succeeded in our first efforts.

In cases like this, occurring in advanced life, we often find it difficult to dilate the os externum. The tent may expand the canal of the cervix to the size of the finger, while the os tincæ may not become larger than a No. 10 bougie. Under these circumstances, if we attempt to force the finger into the cervix, the contracted os feels rigid and resisting as if bound round by a fine wire. And here, instead of repeating the tents, it is safer and better to divide with the knife the sharp, well-

defined edges of the contracted os, which will then permit the finger to pass at once to the cavity of the womb. This diagram (fig. 36) represents the relative expansion of a tent worn for six or eight hours, where the canal of the cervix was dilated, while the os tincæ remained comparatively contracted:—*a*, the cervical portion; *b*, the part constricted by the os; *c*, the vaginal portion.

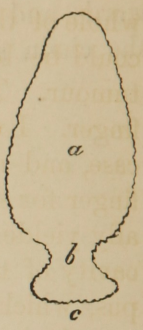

Fig. 36.

I have now completed the series that I proposed to give as types of this disease.

Time was when women died of polypi without any effort being made for their relief. This is not so now. No delicate operation is easier; none more successful. Life is sometimes lost because we think the patient so near death that any interference would only accelerate the fatal issue. This is a great mistake. To save life where death is imminent, we are justified in assuming great responsibilities and even in taking great risks. I fear that we sometimes hesitate to do our duty by asking ourselves the question, "How will it affect me if I fail?" It has been said of a great American lithotomist that he often refused his skill to bad cases because they might spoil the statistics of his unparalleled success.

In December, 1861, Mr. Preterre, an eminent American dentist in Paris, asked me to see Madame R., in consultation with her physician. She had menorrhagia for many years, and was extremely prostrated by it, and by a profuse muco-purulent vaginal discharge, which had been present for six or eight months whenever the hæmorrhage ceased. She had been seen by many of the most eminent surgeons in Paris, but no one suggested anything for her relief. I found the uterus retroverted

and greatly enlarged, the fundus extending quite to the hollow of the sacrum, and seemingly filling up the whole of this region. A glance showed at once that it could be but one of two things—a polypus or a fibroid tumour. The os tincæ admitted the end of the index finger. I was anxious to determine the nature of the case, and made gentle but persistent pressure with the finger for some moments through the cervix. It gradually yielded to the force, and the finger, gliding to the cavity of the uterus, detected an enormous fibrous polypus, which could not pass outwards because of the retroflexion. I was obliged to be in London the next morning, but promised to return to Paris in a week, for no other purpose than to apply a sponge tent and remove the polypus for Madame R. Five or six days after my departure they telegraphed to me that she was much worse ; that a consultation of physicians had decided that it was now too late to attempt any operation, and therefore that it was unnecessary for me to return to Paris. Fortunately, the telegram was not received, and I returned to Paris to find my patient in a state of complete exhaustion. She had a profuse, dirty, offensive, sero-sanguinolent discharge from the vagina, which poisoned the whole atmosphere of her apartment. Her pulse was small and rapid; she was quite anæmic, and presented all the appearances of blood-poisoning. On passing my finger into the vagina, I found it entirely filled by an immense fibroid polypus in a state of decomposition. She was evidently dying from the absorption of the detritus of this fetid mass. At my first visit, a week before, this tumour was wholly intra-uterine, but now it filled the vagina. I infer that its escape from the cavity of the uterus was due to powerful contractions provoked by the forcible introduction of the finger

for exploration, for she grew worse from the moment of my visit. She had forcing pains, as of labour, for a while, and afterwards passed into the low condition in which I found her. Its pedicle (as is most usual) grew from the anterior wall. What was to be done? There was assuredly but one course to pursue. If we allowed this great mass to remain there and slough away, death was absolutely certain. Its speedy removal gave the only hope of rescue. Her physicians consented to its écrasement, which occupied ten or twelve minutes. Vaginal washes, wine, and a generous diet soon completed the cure. If I had received the telegram, she would certainly have died, and I should have been censured by her friends for hastening the fatal issue, inasmuch as my previous visit was the inauguration of a new phase of her sufferings. If I had been afraid to operate because she was almost in a moribund state, she would unquestionably have been lost. For the successful after-treatment of this case I am indebted to Dr. Morpain.

I have related this case perhaps too minutely, but it is to encourage the young man never to falter in the clear path of duty to his patient, and to show that extreme exhaustion is no barrier to the mere operation; for, when effected by the écraseur, there is no danger of hæmorrhage, and very little of any other character.

I have no idea how many polypi Dr. Emmett and myself have removed at the Woman's Hospital and in private practice, and the case of Professor Metcalfe above related is the only fatal one. This great success is certainly due to the fact that we always used the écraseur or scissors. It would seem that by these the operation is almost always safe, while by deligation it is fraught with great danger.

Dr. Graily Hewitt is wholly opposed to deligation; so are many other recent writers. Dr. M'Clintock has written most clearly and ably on this question.* He reports ten operations by ligature, of which three were fatal, and twenty-four by knife, scissors, or écraseur, without a single death. He says, moreover (p. 183), that "a very high rate of mortality followed the use of the ligature in the cases reported by Dr. R. Lee; for, of fifty-nine instances where the ligature was applied, nine of the women died, and two of these deaths occurred before the removal of the tumour was effected. . . . Dr. Lee gives thirty-five other cases where polypi were removed by torsion or excision, and amongst these there is no death."

After this, it seems to me that it would be not only hazardous, but absolutely culpable in us ever to resort to deligation when there is any chance of immediate ablation either by excision or écrasement.

Before closing this subject, I may mention that Dr. J. H. Aveling, of Sheffield, has added a valuable instrument to our surgical resources for the removal of polypi on the principle of écrasement. It is represented in fig. 37. The thumb-piece *a* is connected with the projection *b* by a rod, which slides along a groove in the shaft, which is driven by means of the screw at the handle of the instrument. When the extremity *c* is placed around the pedicle, the part *b* is made to sever it by being forced through till it is entirely lost in the fenestral opening in the curved extremity. Dr. Aveling calls this instrument the Polyptrite. It is described in the Obstetric Transactions, vol. 4.

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* "Clinical Memoirs," pp. 183–186.

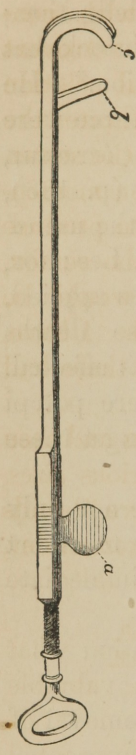


Fig. 37.

Of Menorrhagia from Fibrous Tumours.—The uterus is particularly prone to the development of fibroid tumours. They occur at all ages after puberty. They are seen in young girls under twenty, and in the octogenarian, and may vary from the size of a pea to that of the gravid uterus at full term. They are in themselves innocuous, except mechanically, as when they exert an undue pressure upon the bladder, rectum, or pelvic nerves and veins, or when they produce hæmorrhages. They frequently prevent conception, but not necessarily and invariably so. They are classed according to the manner of their attachment to the walls of the uterus—as extra-uterine, intra-uterine, and intra-mural.

Extra-uterine fibroids grow from any portion of the external surface of the uterus, and may be pedunculated; or they may be sessile, with a broad immovable attachment to its outer muscular tissue.

The intra-uterine project into the cavity of the womb, and, like the first, may be pedunculated or sessile; and here we make a distinction in practice but not in theory, calling the one a fibroid polypus because it is pedunculated, the other a fibroid tumour because it is sessile, having a broad attachment usually to one wall of the womb; the one being remedied with comparative ease, the other with great difficulty.

The intra-mural are so called because they are embedded in the walls of the uterus, being interlaced and overlapped in all directions by its muscular fibres.

Fibroid tumours interfere mechanically with conception; for instance, they may antevert or retrovert the uterus, and throw the os out of its normal relation with the axis of the vagina. They may elevate the whole organ high up in the pelvis, so that the semen may never come in contact with the os even momentarily. They may compress the canal so as to produce a mechanical obstruction to the passage of the semen, or they may produce hæmorrhages which would be fatal to the life of the germ even if vivified. I have, however, occasionally seen pregnancies where there had been for years large fibroid tumours.

Of 225 women who had once borne children and then became sterile, 38 had fibroid tumours of various sizes, and variously seated—or one in $6\frac{7}{10}$. Two were fibroids of the posterior lip of the os tincæ; the remainder, of the body of the uterus. Of these,

Six were pedunculated . . . {
- 2 on the anterior wall.
- 2 on the posterior wall.
- 1 on the left side.
- 1 on the right side.

Twenty were sessile . . . . {
- 2 on the fundus.
- 5 on the anterior wall—one very large.
- 8 on the posterior wall.
- 5 on the right side—none on the left.

Nine were intra-mural . . . {
- 1 in the fundus.
- 7 in the anterior wall.
- 1 in the posterior wall—very large.

One intra-uterine—very large and growing from the posterior wall.

Of 250 married women who had never borne children, the cause of sterility was found to be compli-

cated with the presence of fibroid tumours in 57, being at the rate of about one in $4\frac{3}{10}$. Of these,

Five were pedunculated . . {
- 2 on the anterior wall.
- 2 on the posterior wall.
- 1 on the fundus.

Twenty-one were sessile . . . {
- 8 on the anterior wall—one of them reaching round to the right side, and one to the left.
- 10 on the posterior wall — one of them reaching to the right side, and one to the left side.
- 2 on the left side.
- 1 on the right side, and very large.

Thirty-one were intra-mural . {
- 3 in the fundus — one very large.
- 23 in the anterior wall—two very large.
- 5 in the posterior wall—two very large.

None intra-uterine.

In 100 virgins consulting for some uterine disease, 24 had fibroid tumours, or one in $4\frac{1}{6}$. Of these 24,

Three were pedunculated . . {
- 2 on the anterior wall—both very large.
- 1 on the posterior wall.

Five were sessile . . . . . {
- 2 on the anterior wall — one large.
- 2 on the posterior wall — one reaching round to left side.
- 1 on the right lateral wall—and very large.

Thirteen were intra-mural . . {
- 11 in the anterior wall — three large.
- 2 in the posterior wall.

Two intra-uterine . . . . . } 2 to posterior wall—and both very large.

One large fibroid attached to sacrum.

The polypoid fibroids are excluded, because they are considered separately in the previous section on Polypus. Were they included here, of course the intra-uterine fibroids would be greatly increased. This arbitrary arrangement is pathologically incorrect, but practically right.

To recapitulate—Thus, of 605 cases (100 being unmarried, and 505 being married and sterile) 119 had fibroid tumours, either large or small, connected in some way with the uterus, being nearly one in 5½.

The following table embraces the whole at a glance :—

Of these 119 *cases of fibroid tumour* :—		Fundus.	Ant. wall.	Post. wall.	Left lateral.	Right lateral.	Total.
14 were pedunculated . .	....	1	6	5	1	1	14
46 were sessile	....	2	15	20	2	7	46
53 were intra-mural	....	4	41	8	....	....	53
3 were intra-uterine . . .	....	....	....	3	....	....	3
1 was sacral	1	....	....	....	....	....	1
2 were on the posterior lip (os tincæ)	2	....	....	....	....	....	2
Total	3	7	62	36	3	8	119

These tables show the great frequency of fibroid growths in connection with the uterus, a thing long ago established by West and others. It will be seen that (62) more than half of the whole number were seated in or on the anterior wall.

It will be remembered that I have said (page 84)

that we find intra-uterine polypi (which are only pedunculated fibroid tumours) more frequently attached to the anterior than to the posterior face of the cavity of the uterus. I only state the fact without pretending to explain the why or the wherefore.

I give these details simply because I have them, and not because I attach much value to such statistics. They are entirely from cases observed in private practice. Had I now access to the books of the Woman's Hospital, it is probable that these figures might be changed, but only relatively. Fortunately for my patients but two of these 119 cases were verified by *post mortem* evidence. Their diagnosis rests wholly upon the judgment of an individual, which is infallible in no man.

But I will claim, what I would allow to any one else, that the errors of judgment would be not of fact but of degree—for instance, here is a case of fibroid tumour of the anterior wall—it is as large as a Sicily orange. Of its situation and general outline there can be no doubt, but there may occasionally be a case in which we are a little doubtful whether it be intra-mural or merely sessile. And if the figures above could be varied in any way, it would be in some such unimportant relation as this.

The diagnosis of fibrous tumours is much more certain now than it was before the introduction of the uterine probe by Dr. Simpson. Twenty years ago how few of us could tell whether the uterus was anteverted or retroverted; whether its enlargement, if any, depended upon a mere hypertrophy of its proper tissue, or upon some adventitious growth either within, upon, or near the organ. Now, however, we diagnose uterine complications with the utmost precision—and all by the touch, the tent, and the probe.

As a rule, the diagnosis of fibroid tumours is not difficult. We are more apt to fail in detecting small tumours than large ones, and yet it is easy to map out very minute nodosities on the surface or in the walls of the womb. The whole secret of this consists in getting the body of this organ between the left index finger in the vagina and the right hand in the hypogastrium, as explained on pages 10 and 11, so that every portion of its surface is minutely traversed, and any deviation from its normal size is accurately measured.

If it be already anteverted, there is not the least difficulty in this. If it be retroverted, or even in its normal position, then it must be brought sufficiently forward to be grasped between the sensive forces of the two hands. If the walls of the abdomen are very thick, there may be some little obscurity for a while, but a second effort will usually clear it up. If the patient holds the breath, and contracts the abdominal muscles, we may be compelled to etherize her—but this is rarely necessary. But, suppose we have a tumour in the pelvis the size of a small orange, or as large as the fist. Is it in the uterus? on the uterus? or quite detached from it? The sound determines the direction and depth of the uterine cavity, and shows its relation to the enlargement, and this in conjunction with the means of palpation already described. But even then we may be occasionally in doubt whether the enlargement is due to something in the cavity of the uterus, in its walls, or on the outside—and here the sponge tent comes to our aid, and enables us to explore the uterine cavity by the touch.

But suppose we have a tumour in the Douglas cul de sac. We ask ourselves the questions—Is it a retroversion or flexion? Is it merely hypertrophy of the

posterior wall? Is it a fibroid, interstitial, sessile, or pedunculated? Is it a prolapsed enlarged ovary? Is it a collection of pus, of blood, or of fæces? The history of the case will give the probable clue to many of these queries; but the application of the principles of investigation already laid down can alone accurately solve the real nature of the malady. Longer minute detail on this point would be profitless. Enough has been said to show the student that positive knowledge of this character can be acquired only by the ripe experience of self-training.

As an illustration of the seeming difficulties, but of the real facilities of diagnosis, I here resort to my best argument—a clinical report.

Mrs. ——, from the State of Texas, aged twenty-four, married five years, was sterile. Her menses were regular, painless, lasting three days. She had some leucorrhœa, but consulted me on account of her sterility.

She had been treated by distinguished professors in four of our largest cities, and all, without exception, told her she had retroversion. On making an examination, I found the opposite state of things, viz. a complete anteversion, with a tumour filling up the Douglas cul de sac, and giving to the touch the exact sensation of density and size of a retroverted uterus, with hypertrophy of posterior wall.

But by the method of the consentaneous counter-pressure with the two hands, the position, size, and relations of the uterus and tumour were readily traced out as shown in this diagram (fig. 38). The left index finger, after exploring anteriorly at *a*, was carried on till it passed to the posterior cul de sac at *b*; then the points of the four fingers of the right hand were pushed firmly backwards and downwards, from *e* to *d*, carrying the abdominal

walls from their normal line at *c* deeply in the direction of the dotted line *e d*. When this hand was carried as far in this direction as could be done with convenience to the surgeon and comfort to the patient,

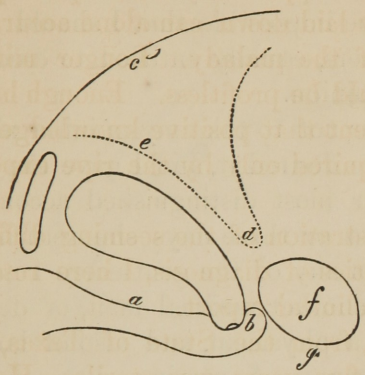


Fig. 38.

it was held there immovably fixed, while the index finger of the left at *b* was made to elevate the cervix uteri as if to bring the points *b* and *d* into contact. If the uterus be anteverted, as it was here, then the fundus will be pushed up against the palm of the outer hand at *e*, to be grasped, as it were, between the two opposing forces, and thus accurately measured—while the same discriminating pressure detects, at the same time, the presence of the tumour *f*. To be more positive on this point, the index finger was pushed backwards, carrying the posterior wall of the vagina to *g*, where it was able to elevate the tumour, passing it up against the points of the fingers at *d*, while they were still cognizant of the presence of the body of the uterus as already indicated. This examination made the case perfectly plain; but, to fortify these facts, the finger was passed into the rectum, which confirmed, but added nothing to

the evidence of the previous method. A sound was also passed to the fundus of the anteverted uterus, which would have removed all doubt if there had been any.

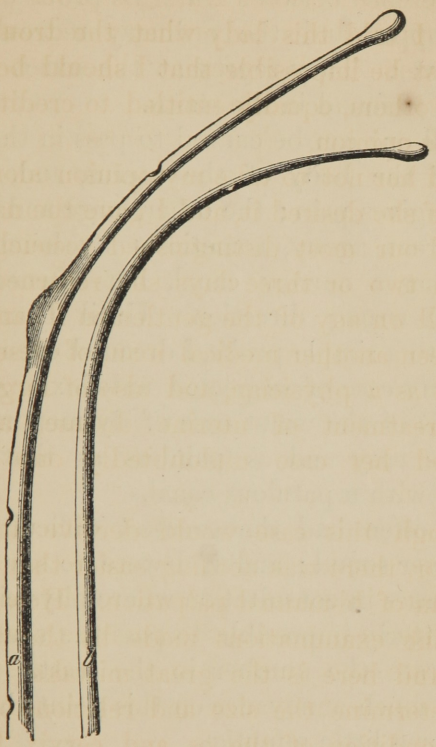
When I told this lady what the trouble was, she said it must be impossible that I should be right, when five or six others, equally entitled to credit, were all of an opposite opinion.

I asked her not to take my opinion alone, but to go to others if she desired it, and I gave the names of three or four of our most distinguished accoucheurs in New York. In two or three days she returned, saying she did not call on any of the gentlemen I named, but that she had seen another medical man, of deservedly great reputation as a physician, and also of large experience in the treatment of uterine disease, and that he pronounced her case undoubtedly one of retroversion.

Although this case would deceive any superficial investigator, there was nothing easier than its diagnosis by the plan of bi-manual palpation. How often have I seen uterine examinations made by the vaginal touch alone! And here is the great mistake. This is very well to determine the size and relations of the vagina, and the condition of the os and cervix, but so far as anything else is concerned, it is simply futile. It is merely groping in the dark. The value of the uterine sound cannot be over-estimated when used merely for purposes of diagnosis, whatever may be said of it as a redresser. If we are not able to determine the position, size, and relations of the uterus by the touch alone, the sound is infallible in giving us its depth and direction. If we find a tumour of any sort either before, behind, or to one side of what we usually regard as the normal

position of this organ, the probe will instantly tell us if it be the body of the uterus or not.

I use the sound simply as a probe to measure the



FIGS. 39 & 40.

depth of the uterus, and to show in what direction the fundus lies. For this purpose I have it made of virgin silver or of annealed copper, silvered. It is also smaller than Simpson's sound, and without notches or marks. It is made malleable because it is necessary to change the curvature with almost every case. It is smaller to make it universally applicable, whether the canal and os internum be large or small. It is without

indentations or marks, to enable us to keep it thoroughly clean.

These two diagrams (figs. 39 and 40) represent the relative difference between a uterine probe of malleable silver or copper and the ordinary redresser of hard German silver. They represent the exact size of the instruments as found in the shops.

The small one can be curved to pass in the suspected direction of the body of the uterus, and, if properly done, never gives pain; the other, large and rigid, often produces great agony, sometimes by being too large to pass along a narrow canal, but oftener by being forced in a wrong direction. Until I modified the instrument to a simple probe, I dreaded even to attempt its use in any case of suspected anteflexion. But now the diagnosis of the worst case of dysmenorrhœal anteflexion is as easy and as painless as that of an old retroflexion with a patulous canal.

I have often had the greatest difficulty with the German silver sound; and if I were to say I had seen a score of cases in consultation where physicians assured me it was utterly impossible to pass the sound, I would not exaggerate the number in the least. I have felt and seen so much annoyance on this point that I may be pardoned for a little minutiæ.

The cases that usually give us most trouble are those of complete anteflexion, with a fibroid in the anterior wall. One will serve as an example of the class. Let fig. 41 represent an anteflexion with a fibroid, *a*, as large as an almond, in the anterior wall. If we should attempt to pass the large German silver sound, in its fixed position, to the fundus uteri, it would inevitably be arrested at *b*, it matters not how dexterously we may elevate the fundus with the index finger to

straighten the organ up at the time we make the effort.

I have seen such excessive pain thus inflicted that the patient could hardly be persuaded to allow a repetition of the process. And I have often passed the small malleable instrument under such circumstances when the patient was not aware that it had been done. We should never inflict pain if it can be avoided; nor should we carelessly shock the nervous system of one so delicately organized, and that too, perhaps, when that organism is so intensified by diseased action as to exaggerate to an unbearable degree the slightest movement or even sound.

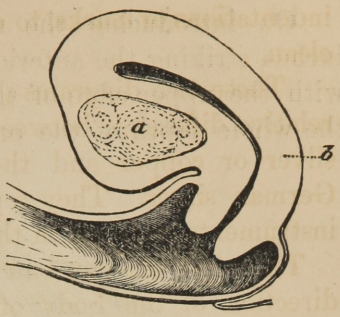


FIG. 41.

Valuable as the uterine probe may be for giving us the direction of the fundus uteri, it is not to be depended upon alone to measure its depth, if that should exceed four inches; and for the simple reason that the curvature necessary to pass it along the pelvian axes would make it strike against the anterior wall of the uterus before it could reach the fundus, if this should be six or eight inches deep.

As an illustration, take the following: A woman, thirty-five years old, the mother of two children, had been for several years subject to menorrhagia. The abdomen was about as large as at the full term of pregnancy. Palpation showed that it was due to an enormous tumour, which was either wholly uterine or uterine and ovarian. A physical exploration was necessary to determine this point. The diagram (fig. 24) illustrates the diagnosis.

On introducing the uterine probe, it passed four inches, striking the anterior wall of the uterus on a line with the upper edge of the pubes; but was this truly the whole depth of the organ? A gum elastic bougie

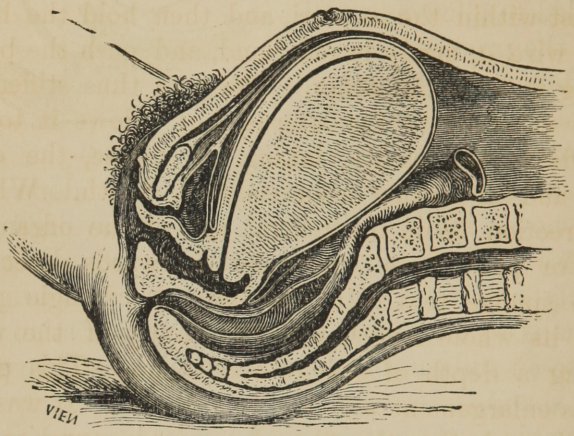


Fig. 42

would settle this point. On making the effort, it passed easily more than eleven inches into the cavity of the uterus, measuring from the os tincæ. But it is not always easy to pass a bougie. If it is large enough not

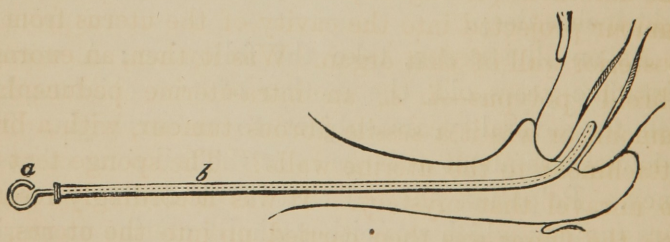


Fig. 43.

to bend on itself, it may not pass through some narrow point, and so will deceive us. And if it be too small,

it will bend on itself in the vagina, and hence it will be difficult to pass it at all. To overcome these objections, take a bougie about No. 6, sometimes smaller, and run a strong wire in it, and give it a gentle curvature at the distal end, as shown in the diagram (fig. 43). Introduce this just within the os uteri, and then hold the handle of the wire, *a*, firmly in one hand, and push the bougie, *b*, along it with the other. The wire thus stiffens the bougie external to the uterus, but allows it to pass onwards to the cavity, taking, of course, the easiest route, and measuring accurately its depth. Whether this direction be in the central axis of the organ, anteriorly or posteriorly, would be afterwards determined by the sponge tent. In this case the bougie passed nearly its whole length into the cavity of the womb, marking a depth of over eleven inches. This proved that its enlargement was due to a fibroid. It was then a question whether this fibroid was intra-mural or intra-uterine. This was proved at once by a very singular fact, viz. that the gum elastic bougie, when introduced into the cavity of the uterus, could be felt through the thin walls of the abdomen, and thinner of the uterus, from just above the pubes, quite to the fundus far above the umbilicus (see fig. 42). This alone showed that the tumour projected into the cavity of the uterus from the posterior wall of that organ. Was it, then, an enormous fibroid polypus—*i. e.*, an intra-uterine pedunculated tumour, or was it a sessile fibrous tumour, with a broad attachment to the uterine walls? The sponge tent was to unravel that mystery. It was accordingly resorted to; the finger was then carried up into the uterus, and the anterior portion of the organ was found to be free, while on the posterior, about an inch above the os tincæ, we felt a large tense tumour, having attachments poste-

riorly at the cervix, which widened out on either side as the finger was thrown in front and around it. The finger detected its attachment posteriorly below, while the probing with the elastic bougie demonstrated it above; thus proving that the tumour grew from the posterior wall of the uterus, and that it had a base of attachment along this wall of probably not less than eight or nine inches. The tumour itself was unusually tense to the touch, and we concluded to explore it by puncture. In the presence of Dr. Emmet, Dr. Pratt, and Professor Elliot, I passed a trocar into it at its lowest point, and in the direction of its long axis, and there were discharged more than twenty ounces of a colored serum. The puncture was enlarged for two inches, to prevent its closing. There was at once a sensible diminution in the size and tension of the abdomen. The discharge kept up for some time; and this, together with occasional injections into the very fundus of the uterus, with the liquor ferri persulphatis, diluted with three or four parts of water, arrested very promptly the hæmorrhages, and the patient was dismissed in two months in a very comfortable condition, and with strength enough to walk six or eight miles. Indeed, so far as the hæmorrhages were concerned, she was cured. She returned in a few weeks with ruddy looks to report that she was in very good health, although the abdomen was seemingly as large as ever. It was evidently a fibro-cystic tumour, its first element remaining *in statu quo*, while its second was destroyed by the puncture and slitting up of the cyst. Within the course of a year afterwards this poor woman died of cholerine of a few hours' duration, which her physician did not think in any way dependent upon the fibroid tumour.

We all know that fibroids of the uterus are harmless

unless they produce hæmorrhage or press injuriously on some of the pelvic viscera. I have seen many cases where there were fibroids larger than the fœtal head, and the patients were not aware of their existence. I was consulted in Paris in October, 1863, by a lady who had been married fifteen years without offspring, and she wished to know the cause of her sterility. She had a pedunculated fibroid tumour, large enough to rest on the brim of the pelvis, which drew the uterus forwards and upwards, raising its fundus much above the level of the pubes. Her health was perfect in every respect, and she felt no inconvenience from the tumour, which will doubtless never shorten her life a day.

Of late years a good deal has been written on the treatment of fibroid tumours of the uterus.

Professor Channing, of Boston, claims to have cured many by internal medication ; while Dr. Simpson seems to have great faith in the long-continued use of the bromide of potassium. Dr. Emmet and myself have tried this and other constitutional remedies in the Woman's Hospital and in private practice, and I am sorry to say we have not been as fortunate as the gentleman named above. On the contrary, I have never seen the slightest effect produced on such tumours by any internal medication. Dr. Atlee, of Philadelphia, and Mr. Baker Brown, of London, have each attacked uterine fibroids surgically and in a heroic way.

Dr. Atlee has had a success in enucleation which has not been equalled by any one else. He advocates a total eradication of the adventitious growth ; while Mr. Baker Brown is satisfied with maiming or mutilating the tumour by what he terms a gouging process. His success has also been very great, not in curing the disease, but in curing its worst manifestation—hæmor-

rhage. And with this we should feel well satisfied; for, as a general rule, I do not think we should interfere with these tumours unless they endanger life. That there are cases in which we must interfere I readily admit; and the success of Atlee and Brown will justify such a course. I have not been so fortunate as they in attacking very large intra-uterine fibroids. I have lost two patients in the Woman's Hospital as a consequence of operative procedures; one from an attempt at enucleation, the other from the removal of a bit of the tumour;

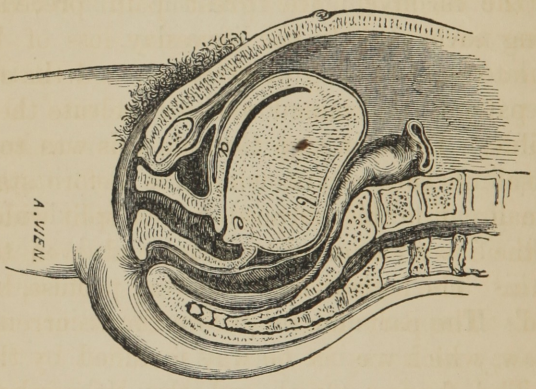


Fig. 44.

the one in imitation of Dr. Atlee, the other in imitation of Dr. Brown. The first was the case of an unmarried lady, twenty-eight years old. Menstruation occurred at sixteen, and continued regular and normal for ten years, when it suddenly became abundant and painful. Two years afterwards, in November, 1859, she was admitted to the Woman's Hospital. The flow was then profuse, exhausting, and attended with severe forcing pains, from which she suffered for a whole week before the menses made their appearance. The uterus

was about the size of the organ at the sixth month of pregnancy. The os and cervix were small, while the body of the organ was large, hard, and roundish. Its outline and relations are represented in fig. 44. The sound could be passed in the direction of the uterine cavity for only about four inches, being arrested at *a*, by striking against the anterior wall of the uterus. But the gum elastic bougie showed that the cavity was more than nine inches deep. Then the sponge tent demonstrated that the tumour was intra-uterine, with a broad base of attachment to the posterior wall, beginning just within the os, at *e*. The great pain preceding and attending each period; the excessive loss of blood at the time; the increasing prostration; and the entreaties of the patient, determined me to enucleate the tumour if possible. The first step towards this was to enlarge the canal of the cervix, which, as before stated, was very small. For this purpose it was split widely open up to the insertion of the vagina, and even to the os internum. The hæmorrhage was very profuse, but easily checked. The parts healed before the recurrence of the next flow, which was in no way modified by the operation. The forcing pains and the hæmorrhage were quite as great as before.

After this, the next step of enucleation was taken, viz. cutting open the capsule of the tumour. Instead of making a long incision through this from above downwards, as practised by Dr. Atlee, I simply cut the capsule transversely at *e*, making an opening in it about two inches and a half long, and then passed a sound for six or seven inches in the direction of the dotted line *e b*, extensively lacerating the cellular tissue that bound the posterior wall of the uterus and the tumour together. I now think Dr. Atlee's plan

of incising the capsule would have been the best. The bleeding was very profuse, but it was wholly from the first incision, and not from the subsequent laceration. This was checked by a tampon.

After Miss M. recovered from the effects of this operation, it was thought advisable for her to go to the country, and wait the efforts of nature in forcing the tumour down through the artificial opening made in its capsule.

She returned in two or three months with the mouth of the uterus about two inches and a half in diameter, and a portion of the tumour projecting through it into the vagina. The pain and the hæmorrhage were rather worse, whether in consequence of the operation, or in spite of it, I do not know.

The attachments of the tumour were now further incised, and its adhesions extensively broken up, but unfortunately Miss M. was attacked with diphtheria, from which she barely escaped with her life. So great was her prostration from this disease and the hæmorrhages combined, that she was again removed from the hospital.

She returned six months afterwards (in October, 1860), but the hæmorrhages were in no way modified by the process of enucleation, which had been slowly going on for months. The uterus had greatly increased in size, notwithstanding the fact that the tumour, now filling up the whole vagina, was quite as large as the fœtal head at full term. Indeed, it seemed that the removal of the obstructions at the cervix uteri only invited and promoted the growth of the tumour downwards, without dislodging any portion of it from the body of the organ. Its size was so enormous that it was thought advisable to remove all that portion of it

that projected through the dilated cervix, preparatory to the real enucleation and ablation of what occupied the body of the womb.

Accordingly, a cord was passed around it in the direction of the dotted line *a* (fig. 45), where it was severed. The hæmorrhage was fearful, and she lost a large amount of blood before it could be controlled by a tampon. She scarcely rallied at all from the effects of the chloroform, and died of exhaustion in thirty-six hours afterwards.

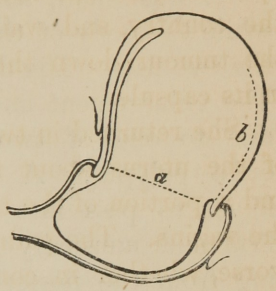


Fig. 45.

I think that death in this case was caused by the unexpected and immense loss of blood that suddenly took place in the brief space of time between the severance of the tumour and its removal from the vagina.

The prolonged use of the chloroform in all probability exerted a very pernicious influence.

The portion of the tumour removed was so large that it was with great difficulty extracted from the vagina.

Indeed, to do this, it was necessary to enlarge the ostium vaginæ by perineal incisions, one on each side of the fourchette. A similar case to this was operated on at the Woman's Hospital the year before.

That part of the tumour projecting into the vagina was removed by écrasement, in October, 1859. Our patient recovered from the effects of the anæsthesia and the operation, and we expected to enucleate the remainder of the tumour, when she was suddenly attacked with peritonitis, four months afterwards, which carried her off.

In June, 1861, a widow lady, aged 30, who had been for two years subject to menorrhagia, was admitted into the Woman's Hospital. These periodical hæmorrhages were profuse and exhausting, and she had all the evidence of extreme anæmia. The os tincæ was small, and the cervix firm and indurated, while the body of the organ was felt to be as large as the two fists. The depth of the uterus was five inches. The enlargement and the hæmorrhage were evidently due to one of two things—either a fibroid tumour or a polypus. A sponge tent or two enabled the finger to pass into the uterine cavity, when a very firm and unusually hard tumour was found projecting from the posterior wall of the uterus, having a broad, strong attachment to its whole posterior surface.

A puncture was made in that portion of the tumour nearest the cervix, and a large quantity (eight ounces) of a clear, limpid, transparent, straw-coloured serum was evacuated. To make sure of a radical cure, a bit of the sac of this fibro-cystic growth was removed with scissors. It was elliptical, and about one inch and a half long by three quarters of an inch wide. This was done in imitation of Mr. Baker Brown's gouging process. I had seldom felt so well satisfied with an operation; but unfortunately irritative fever set in, and my patient died of pyæmia in the course of twenty days. These four cases are all that have been subjected to any operation for radical cure in the Woman's Hospital.

Two recovered from the operations, but both died within a year afterwards—one from peritonitis; the other from cholerine of a few hours' duration. Two died from the immediate effects of operative procedures—one of these from exhaustion produced by loss of blood aided by chloroform poisoning; the other

from pyæmia. It may be thus literally stated that two died and two recovered; for death in the last two was due to accidental causes which were most probably independent of the operations.

The complete eradication of an intra-uterine fibroid with a broad sessile attachment is exceedingly hazardous, while the removal of an intra-uterine fibroid with a peduncular attachment is comparatively one of the safest operations in surgery.

But why take so much time with fibroid tumours? Could the removal of such immense tumours be followed by conception and safe delivery?

It might very well be a question, whether such a hazardous operation as the enucleation of a large fibroid tumour should be performed simply for the removal of sterility, and when the life of the sufferer was not jeopardized by severe hæmorrhage. But I could very well imagine cases where it would be justifiable. Suppose a dynasty was threatened with extinction, and the cause of sterility was ascertained to be an enucleable fibroid: here the perpetuity of a good government and the welfare of the State might depend upon the result. Or suppose an ancient family of great name, influential position, and large fortune, desirous of perpetuating these noble heritages in a line of direct descent: would such an operation be justifiable, if the parties, knowing the risks, were willing to assume the responsibilities?

But could we promise the possibility of conception after all had been successfully done?

As a rule, while there is menstruation there is ovulation, and any woman that ovulates can be impregnated, provided the spermatozoa and the ovum can be brought in contact at the proper time and place, and under favourable circumstances.

The neck of the uterus may have been destroyed by sloughing, or by other means; there may be loss of the greater part of the vagina; there may be partial atresia of it; there may be an ovarian tumour; there may be fibroid tumours, pedunculated, sessile, interstitial, or intra-uterine; there may have been hæmatocele, pelvic cellulitis, or even carcinoma of the neck of the womb, and yet conception is always possible, provided menstruation, the sign and symbol of ovulation, be such as to warrant a healthy condition of the uterine cavity, the nidus of the new being.

Our literature teems with cases of delivery complicated with fibroid tumours in some part of the uterine structure, and our experience and observation teach us that these tumours are a very frequent source of sterility.

But to return to the question—"Is conception possible, and safe delivery probable, after the enucleation and removal of a large intra-uterine fibroid?" It is not at all uncommon to see this follow the removal of the intra-uterine pedunculated fibroid, called polypus—and why not the sessile fibroid, called intra-uterine fibroid tumour? But the proof of this is fortunately not left to hypothesis or analogy. And the question is answered affirmatively by the record of one of the most interesting cases to be found in English medical literature, by Mr. Grimsdale,* of Liverpool. The interest of the subject will justify me in extracting the general features of the case from Mr. Grimsdale's published account.

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* A Case of Artificial Enucleation of a large Fibroid Tumour of the Uterus; with some Remarks on the Surgical Treatment of these Tumours. By Thomas F. Grimsdale, Surgeon to the Lying-in Hospital, and Lecturer on Diseases of Children, at the Liverpool Royal Infirmary School of Medicine.—*Liverpool Medico-Chirurgical Journal*, January, 1857.

On the 12th October, 1855, Mr. Grimsdale first saw Margaret West, aged 33 years, a stout healthy-looking woman, married three years; eleven months after marriage (say in 1853) delivered prematurely of a still-born child, profuse flooding, checked with difficulty; in 1854 conceived again, but miscarried at three months on Christmas; this also attended with great flooding; menstruation very profuse, but regular after this, till three months ago (say in July, 1858); supposed herself pregnant, but there was no nausea. The uterus was about the size of this organ at six months, but without the usual elastic feel of pregnancy. A loud bruit heard all over the tumour, cervix uteri pushed forward, os open, lips everted, hard and granular.

Mr. Grimsdale's diagnosis was, "fibroid tumour of the uterus; probably pregnancy in addition." He watched her for a fortnight. She had occasional profuse discharges of blood. On consultation with Mr. Bickersteth, they agreed that the safety of the patient demanded the induction of abortion at once. Sponge tents were used, the cavity probed for seven inches, the tumour found to be adherent to the whole extent of the posterior wall.

Mr. Bickersteth made the incision for enucleation with a straight bistoury through the posterior wall of the cervix, about three-quarters of an inch within the canal, and, coming down on the capsule of the tumour, plunged the knife into it; index finger passed through incision nearly to the second joint, and the tumour was thus separated for some distance from the proper tissue of the uterus. But little bleeding followed the incision, which was plugged, the lint being forced up between the tumour and the uterine wall.

1*st day after operation.*—Pulse 96; vagina hot; tampon removed; vagina syringed.

2nd day. — Aborted a four months' fœtus and placenta.

7th day.—But little variation; vagina syringed and opening plugged daily.

8th day.—Uterine pains; watery discharge; tumour began to protrude through the artificial opening, which was dilated a little more; presenting part of tumour soft; discharge offensive; pulse 120; countenance pale, anxious; tongue dry; thirst.

During the next week her condition changed a little for the better. She took beef-tea, opium, ergot, and had the vagina syringed twice a day. The tumour gradually dilated the artificial os, when, on the 14th day, the fingers could not reach the uterus; the tumour had passed through, so as to fill the upper part of the vagina. It was soft and sloughy; pulse 96.

15th day.—Much worse; had a chill this morning; since then very low; pulse 112; thready; tongue dry; glazy; countenance anxious; very desponding; ordered brandy and beef-tea. 9 p.m.—Messrs. Bickersteth, Blower, and Fitzpatrick present; pulse a little better, but thrilling; tongue as before; countenance bad; put her under the influence of chloroform, which improved the pulse.

Mr. Grimsdale then passed his hand by the side of the tumour into the cavity in the posterior uterine wall, and easily separated the few attachments that remained at its middle and lower portions. He found the great bulk of the tumour soft and sloughy, somewhat like the placenta of a child dead some time in utero, and already separate from the uterus. Posteriorly, and high up near the fundus, some firm fibrous bands passed from the uterus to the tumour, which resisted all efforts to break through them they

extended over about three square inches of uterine surface; there were eight or ten distinct bands—one as large as the finger flattened out, and containing soft sloughy tissue. Finding it impossible to lacerate these bands, he held his hand in the uterus till Mr. Bickersteth went for a large pair of scissors, which occupied some thirty minutes. Even then the completion of the operation was difficult and tedious, for he says—"After continuous efforts for nearly an hour, I succeeded in dividing entirely its attachments, and removed the tumour, a sloughy mass about the size of an ordinary placenta." There was no hæmorrhage, and withdrawing the hand and the tumour, the uterus contracted down exactly as after the extraction of a placenta, and felt externally to be about the size of a normally contracted uterus after an ordinary labour. From this time her restoration to health was gradual, but sure. In a fortnight all fetid discharges had ceased. In two months the uterus had quite recovered its natural size and position, and on the sixty-eighth day after the operation she began to menstruate. It lasted four days, painless and normal in quantity and quality.

So far this case is most interesting surgically. If Mr. Grimsdale had not removed the decaying, sloughing mass as he did on the fifteenth day, his patient would evidently have died of pyæmia in a very short time. But, to me, the most interesting part of the case is to be related.

The operation was performed on the 4th November, 1855; the tumour removed on the 20th. Menstruation returned on the 27th January, 1856; again on the 25th February; and she probably menstruated again about the 24th or 25th of March, for in a foot-

note in Mr. Grimsdale's report, he says, "Since the above was in type, I have delivered this patient of a well-grown eight-and-a-half months child, stillborn. The membranes ruptured suddenly on the 17th December, 1856. There was a slight discharge of blood soon after, but no pain till the 20th. At this date the fœtal heart-sounds were heard distinctly. The os dilated very slowly; the presentation was footling; and there was very inefficient expulsive action in the second stage of labour. On the morning of the 22nd I got hold of the left foot, and completed the delivery. The child had evidently been dead many hours, the cuticle of the feet having begun to desquamate. It measured twenty-one inches in length, and was plump and well formed. The placenta, large and healthy-looking, came away immediately, without hæmorrhage. The uterus contracted well and remained so."

The evident bearing of this case on the subject under consideration is my apology, if any were needed, for giving so minutely its synopsis and sequel. For it is a direct answer to the question, "Is conception possible and safe delivery probable after the enucleation and removal of large fibroid tumours?"

Before dismissing this subject, I may state that Mr. Baker Brown does not now mutilate the fibroid, but satisfies himself with simply incising the os and cervix uteri. But the most philosophical and, indeed, the most successful treatment of hæmorrhages from fibroids is that of Dr. Savage, of the Samaritan Hospital. He dilates the canal of the cervix with a sponge tent, and injects the cavity of the uterus with a solution of iodine, which has been so far both harmless and efficient. His formula is this:—

℞	Iodine	ʒ i.
	Iod. Potassium	ʒ ij.
	Rect. spt. wine	℥ ij.
	Water	ʒ vi.

It invariably stops the bleeding, and, he says, when repeated at each occurrence of the flow, for five or six months, the tumours undergo a sensible diminution, and in some instances have entirely disappeared.

I have seen remarkable results from this treatment of Dr. Savage, and if the experience of others should be as fortunate as his, he will have substituted a simple, safe, and most successful method for one fraught with doubt, difficulty, and danger.

Dr. Routh* follows the plan of Dr. Savage, but substitutes a solution of the perchloride of iron for the iodine. I have used both agents, and the objection that I make to the iron is, that while it arrests the bleeding promptly, by coagulation, it takes two or three days for the uterus to expel the large masses of coagula, which often provoke very severe forcing pains. Whereas when the iodine is used the patient complains only of a little sensation of internal warmth, which is quite transitory.

It is very probable that the curative process of Mr. Baker Brown's simple incision of the os, and of Dr. Savage's iodine injection, and Dr. Routh's iron, all depend more or less on bringing about a degree of subacute inflammation in the uterine cavity, for I hear from Dr. Greenhalgh that Mr. Brown's operation when

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* "On some Points connected with Pathology, Diagnosis, and Treatment of Fibrous Tumours of the Womb; being the Lettsomian Lectures," &c. By C. H. F. Routh, M.D., &c. London: T. Richards. 1864.

successful always produces a great degree of constitutional disturbance, with considerable tenderness over the whole abdomen, but especially in the uterine region.

I had the opportunity of making a *post-mortem* examination in a case of fibroid tumour, alluded to on page 113, where the removal of a portion of the tumour, nearly as large as a fœtal head, was followed by a most marked improvement in the hæmorrhage. Indeed, after this it could not be called a menorrhagia. The woman died four months afterwards of an acute attack of peritonitis, lasting but a few days. On opening the abdomen the evidences of this suddenly developed and rapidly fatal disease were everywhere visible. On laying open the uterus there were found strong old adhesions, here and there, firmly uniting the anterior wall of the uterus to the opposite surface of the tumour, which grew from the posterior wall.

These bands of adhesion were in all probability the result of the inflammatory action necessarily set up in the part by the recuperative powers of nature after the ablation of the large vaginal portion of the tumour, four months before. This probability is reduced to a certainty when I call to mind the fact that previously to this operation the hand was several times, for the purpose of diagnosis, carried into the uterus, and passed freely and without obstruction between the contiguous surfaces of the uterus and tumour, where they were now found adherent in patches.

This condition of things must, then, have been the result of the operation four months before, and was most probably the cause of the great improvement in the menstrual flow.

While we admit that good results may follow the incision of the os and cervix uteri, after Mr. Baker

Brown's plan, and equally good, with less risk, may follow the injecting process, after that of Dr. Savage, I believe we are not in accord as to their rationale. I venture to suggest that they act beneficially by bringing about the same result, viz., an endo-metritis, minus the suppurative stage. If this be so, then we should adopt the iodine treatment on theoretical as well as practical grounds, as the one most conducive to the production of plastic or adhesive inflammation.

Dr. Greenhalgh informs me that he has had five successful cases from the iodine and sponge-tent treatment, combined with Récamier's method of scraping out fungous granulations, and that they were all cured promptly by a single injection for each ; and that both he and Dr. Savage now use the pure undiluted officinal tincture of iodine, instead of the solution.

It must not be forgotten that the uterine injection is to be always and invariably preceded by the use of the sponge tent ; that this is an essential part of the treatment, and by no means to be neglected, not even if the canal of the cervix should appear to be large enough to permit the easy exit of the fluid. To Dr. Savage we are particularly indebted for this practice, which renders this operation, once most painful and hazardous, now simple and safe.

Many years ago I relinquished the practice of injecting the cavity of the uterus, having seen the most violent and alarming attacks of uterine colic follow the injection of but one drop of a bland fluid ; but now, according to the plan of Dr. Savage, the cavity of the uterus is made tolerant of any quantity of even the undiluted tincture of iodine.

Of Menorrhagia from Inversion of the Uterus.—

Inversion of the uterus is fortunately of rare occurrence, yet as it may happen at any time and in the practice of any one, we shall devote some consideration to it. My countryman, Professor Charles A. Lee,* has given us a very complete monograph on this subject. He has collected from various sources 148 cases, beginning with the writings of Dr. Robert Lee, and ending with those of Dr. Tyler Smith and Professor White, of Buffalo. I would refer the reader to this excellent paper for a large amount of most valuable information which is condensed into a few pages.

In many cases of inversion the cause is said to be, pulling on the cord. It sometimes occurs spontaneously, especially when the labour has been very rapid. It doubtless occasionally happens at a period more or less remote after confinement. But I am disposed to believe that an adherent placenta, particularly to the fundus, is the most frequent direct cause of this accident, whether the cord be pulled upon or not. Some five or six years ago, Dr. Lewis A. Sayre, Professor of Surgery in the Bellevue Hospital Medical College, New York, showed me a case of inverted prolapsed uterus, which occurred in a woman who had never borne children. The inversion was evidently the consequence of a fibroid polypus attached to the fundus by a short thick unyielding pedicle, which, as it passed through the cervix, must have drawn the fundus with it. This case excited at the time a good deal of interest amongst the medical men connected with the hospital, on account of the obscurity of its history and the difficulties of its diagnosis. The

* "A Statistical Inquiry into the Causes, Symptoms, Pathology, and Treatment of Inversion of the Womb." By Charles A. Lee, M.D.—*American Journal of the Medical Sciences*, October, 1860, pp. 313 to 363.

woman had passed the time of menstruation; she therefore suffered no longer from hæmorrhages, but complained only of the mechanical inconveniences of the procidentia.

Dr. McClintock describes a case so exactly similar to this, that the drawing of it in his book (page 98) would pass for an accurate representation of Dr. Sayre's case.

Dr. Lee's paper contains references to several cases similar to these, reported respectively by Browne,* Higgins,† Oldham, Rigby, Le Blanc, and Velpeau, the last four in "Ashwell on Diseases of Women," pp. 403–5.

Dr. Alexander H. Stevens, of New York, has had a chronic case of inverted uterus under observation for more than thirty years. It had existed for some years before he saw it. His patient suffered from periodical hæmorrhages, which ceased with change of life, when the inverted organ diminished in size, as it always does at this critical period. The fundus is now not more than half the size that it was during menstrual life.

Dr. Charles A. Lee ‡ has seen one of twenty-five years' duration, which had remained undetected till he was consulted. The patient was then forty-five years of age. She had had hæmorrhages at intervals, and was quite anæmic. In the course of twelve months afterwards (March, 1858) the menses ceased, her health became vigorous, and there was no need of surgical interference.

Dr. Lee § quotes one case of congenital inversion,

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* *Dublin Medical Journal*, vol. vi. p. 33.

† *Edinburgh Monthly Journal*, July, 1849, p. 889.

‡ *American Journal of the Medical Sciences*, October, 1860, p. 340, case 140.

§ *Loc. cit.*, p. 323.

reported to the French Academy of Medicine by Dr. Williame, of Metz. His paper also contains two cases of inversion occurring at an earlier period of pregnancy. One of partial inversion, reported by Dr. Spae in the *Northern Journal of Medicine*, July, 1845; the other of complete inversion at the fifth month of pregnancy, by Dr. John A. Brady, in the *New York Medical Times*, February, 1856. But the most remarkable case of this sort is that of Dr. Woodson,* of Kentucky. The patient, aged twenty-seven or twenty-eight years, pregnant about four months, was engaged in washing, some distance from the house, when violent labour pains came on, and she was not able to get home. She was greatly alarmed, felt the fœtus protrude from the vagina, and took hold of it and forcibly pulled it away, which brought the uterus entirely out, producing complete inversion. She tore off most of the placenta which was adherent, forced the uterus back into the vagina, and did not call for medical aid for five days afterwards. Dr. Woodson then saw her, in consultation with the family physician; and found the uterus inverted, lying just within the vagina, with a portion of decomposed placenta still adhering. He ordered vaginal washes and an anodyne for the time, and on the next day, the sixth after the accident, he succeeded in replacing the uterus. The loss of blood was not great or alarming, although it had continued from the time the accident occurred.

The replacement of a chronic inversion was formerly thought to be impossible. Now, however, it is proven

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* *American Journal of the Medical Sciences*, October, 1860, Art. XI., "Complete Inversion of the Uterus at four months of Utero-gestation. Replaced six days after the accident." By E. W. Woodson, M.D., of Woodville, Kentucky.

to be not only possible, but quite practicable. Dr. Tyler Smith * replaced one after twelve years of inversion. It required eight days with the india-rubber air-ball pessary, conjoined with manipulation night and morning for ten minutes at a time. Dr. Charles West † has replaced one of twelve months' standing. He also used the graduated pressure of an india-rubber air-ball, after Dr. Tyler Smith's plan. Both of these cases recovered. Professor White,‡ of Buffalo, New York, replaced one of fifteen years' standing. The operation was done in fifty minutes, under chloroform. Unfortunately the patient, thirty-two years of age, died of peritonitis sixteen days afterwards. Dr. Noeggerath, § of New York, has succeeded in one case of thirteen years' standing.

This great revolution in practice in the treatment of chronic inversion is due to Dr. Tyler Smith, who was the first, I believe, in this country, to demonstrate its practicability, and to Professor White, who was the first in America to perform this operation successfully.

I have had but two cases of chronic inversion. In one, the uterus was removed by the écraseur; in the other it was replaced in five minutes under the influence of ether. One had existed for nine months, the other for twelve. One was at the Woman's Hospital; the other in private practice. The first case was sent to the hospital in June, 1859, by Dr. Maxwell, of Johnstown, New York.

This patient, aged thirty-nine, married five years, had

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* *Medical Times and Gazette*, April 24th, 1858.

† *Medical Times and Gazette*, October 29th, 1859.

‡ *American Journal of the Medical Sciences*, July, 1858.

§ *American Medical Times*, April 26th, 1862, p. 230.

had one miscarriage and two labours at full term, the last on the 26th December, 1858. She was in labour nine hours. The pains continued very strong after the expulsion of the child. The placenta was retained. The physician was obliged to remove it, and in so doing, remarked that something had come down which would have to go back again. The mother of the patient saw a large bleeding mass protruding, which the physician pushed up into the vagina. The hæmorrhage and the pains continued for nearly twenty-four hours afterwards.

On the next day another physician was called in, who succeeded in checking the hæmorrhage and relieving the constant pains. About a month after delivery, the hæmorrhage suddenly returned with great force, but was controlled by a tampon. From this time she was never entirely free from more or less hæmorrhage, up to the time of her admission to the Woman's Hospital. She was so completely blanched from loss of blood, and so exhausted, that I hardly had a hope of doing anything for her relief. I have seldom seen any one recover from such a state of exhaustion. The pulse was very rapid and feeble, the heart giving full evidence of her anæmic condition. She could not be raised up in bed without fainting, and would often faint while in the recumbent posture. Her recovery from this condition was wholly due to the extraordinary efforts and attention of Dr. Emmet, whose eminent ability I have so often mentioned in these pages. He arrested the flow by a tampon of the liq. ferri persulphatis of Dr. Squibb; he relieved the disposition to frequent syncope by elevating the foot of the bed, making it an inclined plane, and inviting what little blood she had to the brain; while by stimulants, tonics, and good nutrition, a little by the stomach and a great deal by the rectum, we had the happiness of seeing

our patient rally and gain blood and strength enough to undergo operative procedures. We were afraid of chloroform in her enfeebled condition. She was therefore cautiously etherized. The hand was then passed into the vagina, the uterus grasped, and steady efforts made to replace the organ. These efforts were continued for nearly four hours. The uterus was partially replaced; that is, it was reinverted to such a degree as to place the fundus up within the os uteri, but it could not be passed farther. The diagram (fig. 46) would represent what I mean. It took but a short time to reinstate the organ thus far, but no efforts could do more. A tampon, with some styptic lotion, was applied to hold the uterus *in situ*. And here is where I made the great mistake. If, instead of the styptic tampon, I had adopted Dr. Tyler Smith's plan with the elastic air-bag, the result might have been different. A day or two afterwards, when the tampon was renewed, I was horrified to discover that the vagina, particularly at its posterior cul-de-sac, had an ecchymosed appearance, as if it had been stretched almost to the verge of being ruptured. I am now satisfied that we continued our efforts for too long a time, although they were not made spasmodically. The tampon was changed daily, the uterus being retained as presented in the diagram. There was no pain, no hæmorrhage, and our patient ate and slept well, and improved rapidly in looks and strength.

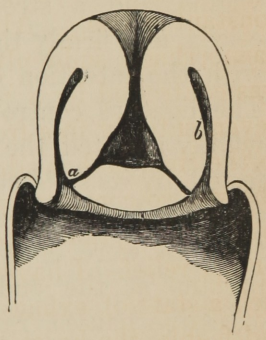

FIG. 46.

About eighteen days after this (July 12th) Mrs. R. was placed again under the influence of ether, and

another effort made to replace the uterus; but after an hour's time we were obliged to desist. The late lamented Drs. Valentine Mott and John W. Francis, of the Consulting Board of the hospital, were both present at each trial, and they were of the opinion, that in this case the entire ablation of the organ would be a safer operation than to make another effort to reinvert it. A few days afterwards menstruation came on, was exceedingly profuse, and the fundus was again forced somewhat into the vagina in spite of the tampon. The uterus was then pulled down into the vagina, and a strong ligature was passed round the cervix, and firmly tightened by a small screw écraseur, with the intention of ultimately removing the organ. The ligature controlled at once the hæmorrhage, and wholly arrested the circulation of the fundus, as manifested by its sudden deep purple colour. But the constitutional disturbance was so intense and alarming, that we were compelled to remove the ligature apparatus at the end of two hours. The great pain, excessive nausea, rapid pulse, clammy skin, jactitation and pinched features were too distressing to be witnessed, much less endured, and so the ligature was removed, and opiates were freely given till she was entirely relieved. A general course of invigorating treatment was followed. Menstruation in August lasted eleven days, but the flow was not very great at any time.

After the September menstrual period, one more effort was made to reinvert the uterus; but we could effect no more than is shown in the diagram (fig. 46).

After this she and her husband begged to have the organ removed, as we promised to do it with the écraseur without pain.

Accordingly, on the 1st of November, she was chloroformed, and the chain of the écraseur was passed round the cervix, near the os, and tightened. When the operation was half finished, a link parted. Another chain was applied, and with this the organ was cut through; but the broad ligament on the right side was fortunately not wholly severed. As the chain was felt to pass suddenly through the uterine tissue, I was about to remove it and the severed tumour together, when all at once the most fearful hæmorrhage I ever encountered took place, and in an instant the vagina was full of arterial blood. If the bleeding had been from the blood-vessels of that portion of the broad ligament already severed and retracted within the peritoneal cavity, it would have been beyond reach, and, of course, our patient would have died before she could have recovered from the effects of the chloroform. Fortunately, the bleeding was from that part of the broad ligament still adherent to the severed uterus. Quickly drawing it forward, I passed the fore and middle fingers through the cervix uteri into the abdominal cavity, and with them compressed the remains of the ligament against the edge of the cervical opening, which promptly arrested the hæmorrhage. The blood was then sponged out of the vagina, and the undivided portion of the broad ligament with the artery was tied; after which a few sponge probangs were passed into the peritoneal cavity, and the blood that had found its way there was carefully removed. It must not be forgotten that the patient was in the usual lateral semi-prone position. The divided edges of the cervix were united by five or six interrupted silver sutures. The one on the extreme right was made to transfix the ligated portion of the broad ligament, which had

been drawn through into the vagina. The edges of the cervix united by the first intention. The opening through the cervix, before it was closed by the sutures, would easily have admitted the passage of three fingers at a time into the peritoneal cavity. This was rather a fortunate thing under the circumstances, as it afforded great facility for sponging out the blood from the peritoneal cavity. The patient recovered rapidly. Dr. Emmet gave her opiates at stated intervals for two or three days, with good nutriment. She had a small vaginal discharge for a short time, till the little projecting portion of broad ligament was removed. Ten days after the operation the bowels were opened by enemata. Two of the sutures were cut off close, and left to be permanently sacculated.

I have occasionally heard from Mrs. R. since the operation, and she remained in good health.

This cut (fig. 47) is copied from a drawing made

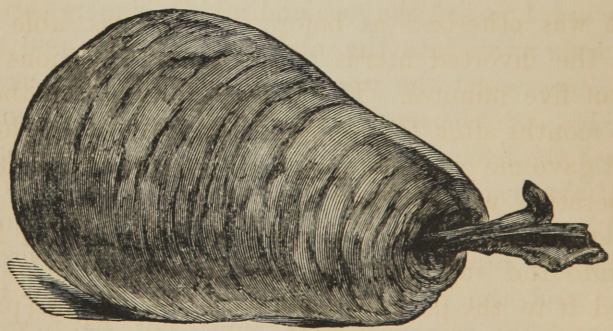

Fig. 47.

immediately after the uterus was removed. It shows that portion of the ligament in which the bleeding artery was found. The artist has slightly exaggerated the long diameter of the organ.

With my next case I was more fortunate. This was a case of a lady in Springfield, Massachusetts, who was attended in her labour by one of the most eminent of our New England practitioners. I presume it was an example of spontaneous inversion at a somewhat remote period after confinement, for the character of the physician is a sufficient guarantee that it could not have resulted from any mismanagement on his part; nor could it have occurred spontaneously at the time of his attendance without being detected by him. A few weeks after this lady's delivery, her physician went abroad. Some months afterwards she called another physician, who treated her for menorrhagia. She did not improve; and by-and-by a consultation was held, when the case was ascertained to be one of inversion.

She was then etherized, and efforts at reduction were made, and continued for an hour without effect. Two or three weeks after this I was sent for; the patient was etherized as before, and I was able to reduce the inverted uterus to its normal relations in less than five minutes. This was in May, 1860, about twelve months after the labour. The medical brethren present gave me great credit for the facility with which the operation was performed. But its speedy accomplishment was a little accidental. Introducing the left hand into the vagina, I grasped the uterus, and soon restored it to the position represented by fig. 46 (page 129), where the fundus is shown as just within the os uteri. At this moment I changed my hold on the uterus, and, rather by accident than design, deeply indented the right cornu, *a*, with the thumb of the left hand; the fingers compressed the opposite side of the organ, *b*, and while the thumb pushed the tissue

in which it was imbedded upwards, the fingers rather acted in a contrary direction on the opposite side; and to my great surprise, the uterus jumped, as it were, out of my hand, assuming its proper normal position. I certainly had not the remotest idea of restoring the organ under a half-hour's effort.

The case reported by Dr. Noeggerath was reduced very much on the principle of the above; but instead of its being accidental, as with me, he reasoned out the process after he had failed by the ordinary method.

As before said, we are indebted to Dr. Tyler Smith, of London, and Professor White, of Buffalo, for our present success in the treatment of inversion of the uterus. These two distinguished gentlemen seem to have worked out the problem about the same time, and independently of each other. Dr. Tyler Smith takes the slower method of persistent and gradual pressure with the air-bag; Dr. White, the more brilliant but more dangerous plan of immediate reduction by manipulation, under the influence of chloroform. I fear that in my own country we have been too much captivated by the *éclat* of sudden success. I am sure now that it would be safer to combine the plans of Dr. Tyler Smith and Dr. White.

I would hesitate a long time before removing another inverted uterus.

Judging from the experience of my two cases, the great difficulty seems to be in passing the fundus through the os internum. It was easy enough in each instance to reinstate the organ to the condition represented by the diagram (fig. 46). That being the case, I should infer that there were no peritoneal adhesions to prevent the completion of the operation.

There is one point that I wish to dwell on particularly.

Those who follow the plan of my distinguished countryman Professor White (whom I have imitated), would do well always to make counter-pressure with the outer hand over the abdomen, as represented in this diagram (fig. 48).

In pushing the uterus upwards by the hand in the

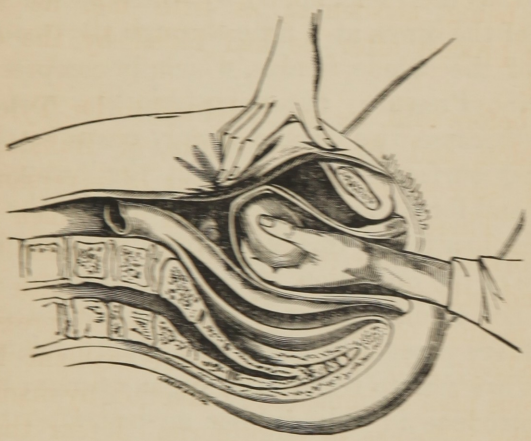

Fig. 48.

vagina, there is certainly some danger of lacerating the vagina and tearing the uterus asunder from its attachments at the posterior cul-de-sac. Counter-pressure will obviate that danger. Another advantage of counter-pressure is that the fingers pushed down on the uterus, as the cervix is doubled on itself, assist very materially in dilating that portion through which the fundus is to be forced upwards.

From what I have already said, it would appear that the reduction of an inverted uterus naturally divides itself into two stages: the first, that of pushing the body of the uterus up within the cervix, as represented in fig.

45; and the second, that of completing the operation by forcing the fundus through the os internum. The first stage is accomplished by directly pressing the body of the uterus upwards, and putting the vagina well on the stretch, which, as Dr. White* says, "pulls open, first its mouth, then its neck, and finally, if persevered in, doubles the body upon itself also;" the second, by compressing the fundus laterally, and deeply imbedding the thumb in the cornus uteri (fig. 46, *a*), by which means we slide one-half of the organ at a time through the os internum instead of the whole fundus, which presents a greater diameter. Pressure antero-posteriorly would avail nothing, because we would simply compress two flat unyielding surfaces together; but the cornus can be dimpled and forced inwards and upwards by the thumb. It is useless to attempt this manœuvre till we complete the first stage of the operation.

I do not think that, as a rule, we should continue our operative procedures more than thirty minutes at a time. If we fail to restore the organ at once, then we should introduce an india-rubber air-bag, after the plan of Dr. Tyler Smith, and wait for our patient to recover fully before trying again.

But suppose after proper efforts we fail to restore the uterus, should we amputate it?

In the hands of Professor Channing, of Boston, and Dr. M'Clintock, of Dublin, amputation of the inverted uterus has proved to be a very successful operation, and one to be justified if all legitimate means of restoration, patiently and perseveringly tried, fail to reinstate the inverted organ.

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* *American Journal of the Medical Sciences*, July, 1858, p. 23.

But before taking this last resort, I would, rather than amputate, make longitudinal incisions from the os tincæ along the cervix to a point beyond the os internum, for the purpose of facilitating the process of reduction.

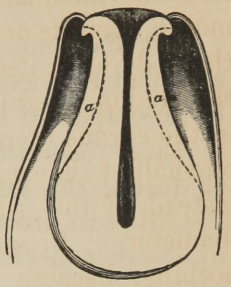

Fig. 49.

I would make at least three—one on each side, as represented in this diagram (fig. 49, *a a*), and another similar on the posterior surface. I say posterior only because it would be easier to make it there than on the anterior surface if the patient be on the left side, with my speculum as it is ordinarily used. The object of these incisions would be to divide the circular fibres of the uterine tissue, and thereby to remove one of the principal barriers to the reduction of the fundus.

I hope I have said enough to show that we should not resort to the operation of amputation till we have tried persistently and patiently every possible means for reinstating the organ to its normal position.

The patient in whom I was so fortunate as to restore the organ after twelve months of inversion, subsequently conceived; and thus we see the important bearing of this operation upon the subject of sterility. Even Dr. Tyler Smith's successful case of reduction after nearly twelve years of inversion, was followed by conception; and these two cases are, I think, sufficient to warn us against a too hasty resort to the operation of amputation.

I have just heard from Dr. Tyler Smith (July 12th, 1865), that his patient "has had several children since the operation (in 1856), and that the medical man who

attended her in her first confinement after the reduction of the inversion, says that complete inversion occurred spontaneously after that confinement, which he readily and at once reduced."

Of Painful Menstruation.—Menstruation may be attended by a general malaise, but should not, as a rule, be accompanied by any very severe degree of suffering. If there is much pain, either preceding its irruption or during the flow, there will generally be a physical condition to account for it, and this will be of a nature to obstruct mechanically the egress of the fluid from the cavity of the womb. The obstruction may be the result of inflammation and attendant turgescence of the cervical mucous membrane, whereby this canal becomes narrowed merely by the tumefaction of its lining coat. But by far the most frequent cause of obstruction is purely anatomical and mechanical. For instance, the os and canal of the cervix uteri may be preternaturally small, or the cervix may be flexed; or these may be complicated with the presence of a polypus, or with that of a fibroid tumour, in either the anterior or posterior wall of the uterus, and occasionally in the antero-lateral portion.

Of 250 married women who had never borne children, 129, or more than half, had pain of an abnormal kind attending the menstrual flow. I have been in the habit of dividing these into two classes, calling the one painful, and the other excessively painful or dysmenorrhœal. Of these 129, 100 were painful, or 1 in $2\frac{1}{2}$ of the whole number; 29 were dysmenorrhœal, or 1 in $8\frac{6}{10}$. Of the 100 painful menstruations, 58 had anteversion, or more properly speaking, anteflexion; 17 of these had fibroid tumours in the anterior wall: 25 had retro-

version; 7 of these had fibroid tumours in the posterior wall; and in 17 the position was normal, one of these having a fibroid tumour. Of the 29 dysmenorrhœal cases, 23 had anteversion; 14 of these had fibroid tumours in the anterior wall: 3 had retroversion; all of these had fibroid tumours in the posterior wall: and in 3 the position was normal. Of the 100 cases of painful menstruation, the os was normal in but 6, unnaturally contracted in 90, otherwise abnormal in 4. Of the 29 cases of dysmenorrhœa, properly speaking, the os was not normal in a single case, being contracted in 26, and otherwise abnormal in the other 3.

The following tabular statement presents the particulars at a glance:—

Of 100 cases of painful menstruation,	Os was normal in but	6
	„ contracted in	90
	Cervix was flexed in	61
	„ congested in	7
	There were polypi in	2
Of 29 cases of excessively painful menstruation,	Os was normal in	0
	„ contracted in	26
	Cervix was flexed in	23
	„ had polypi in	2
	„ was congested in	1

From this it would appear that the pain of menstruation is almost wholly due to mechanical causes, for of the whole 129, only 8 had engorgement or congestion of the lining membrane of the canal of the cervix, and some of these were complicated either with flexure of the cervix, or with fibroid growths in some portion of the body of the uterus. I would not deny that menstruation may be painful merely from a congested state of the cervical membrane, where there is no fibroid growth, no polypus, no contracted os, and no flexure of

the cervix ; but such cases are rare, while the great majority of dysmenorrhœal cases have a contracted os and a narrowed cervical canal or a flexed one. In some instances the os is not larger than a pin's head, or it may be large enough to admit a No. 4 bougie. Again, the os may be quite large enough, but the canal may be flexed so as to form a valvular obstruction to the egress of the menstrual fluid. Sometimes we find the os small and the canal flexed without painful menstruation, and here the cervix is not indurated, but soft and elastic to the touch. Of the 129 cases of painful menstruation, but 20 had the uterus in its normal position, while 81 had anteversion (31 of these with fibroids in anterior wall), 28 retroversion (10 of these with fibroids).

In a great many cases, in addition to a contraction or flexure of the canal, the cervix will be long, pointed, and indurated. If the flexure be anteriorly, we often find the intravaginal portion of the cervix unequally developed—that is, the posterior part, from the os to the insertion of the vagina at *a* (fig. 50) may be an inch and a quarter long, while the anterior, from the os to the insertion of the anterior cul-de-sac at *b*, may not be more than one-third as long.

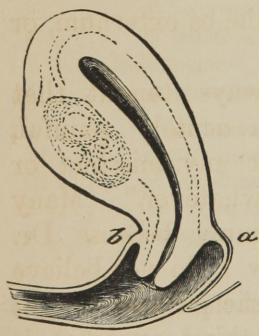

FIG. 50.

The size of the os and the position and relations of the cervix may be ascertained by the touch, as already explained (p. 9). But it is well always to resort to the sound to determine definitely the course, curvature, and contraction of the canal. To the touch and the sight the os may seem to be quite large enough, and then we may find a flexure, perhaps a very acute one, at the

junction of the cervix and body of the womb, due most probably to the presence of a small fibroid in the anterior wall of the uterus (fig. 41, page 105).

According to the facts stated above, it would seem that the pathology of dysmenorrhœa is yet to be written. I am fully of the opinion that it is simply a sign or symptom of disease, to be found in some abnormal organic condition. This may be inflammation, or it may be the cause of inflammation, or it may exist without it. But whether inflammatory or not, its action is mechanical. I lay it down as an axiom, that there can be no dysmenorrhœa, properly speaking, if the canal of the neck of the womb be straight, and large enough to permit the free passage of the menstrual blood. In other words, that there must be some mechanical obstacle to the egress of the flow at some point between the os internum and the os externum, or throughout the whole cervical canal.

Dr. Bennet* says, "I have always taught that menstruation may be painful, even acutely painful, from its dawn to its close, without any mischief or impediment existing of any kind whatever." Many years ago I believed all this, simply because Dr. Bennet and others said so; but now I do not believe in any such doctrine, because experience has taught me otherwise. There is no such thing as what is called "constitutional dysmenorrhœa." There was a time when we looked upon dropsy as an entity, a disease in itself; but now we know that it is only a symptom of various diseases. It is a symptom of disease of the heart, of the kidneys, of the liver; or it may follow hæmorrhages or diarrhœa. So is it with

* *Lancet*, June 24, 1865, p. 673.

dysmenorrhœa: it is only a symptom of disease, which may be inflammation of the cervical mucous membrane; retroflexion; anteflexion; fibroid tumour in one wall of the uterus or the other; contraction of the os internum or os externum; flexures of the canal of the cervix, either acute or gently curved, either at the os internum, at the insertion of the vagina, or extending throughout the whole length of the canal: all of which are but so many mechanical causes of obstruction, which must be recognized and remedied if we expect to cure the dysmenorrhœa. We do not talk of constitutional toothache, of constitutional colic, or of constitutional fractures, or constitutional dislocations. Nor should we speak of "constitutional dysmenorrhœa." This is but a high-sounding term that means absolutely nothing. The fact is, that most of the diseases of the uterus are as purely surgical as are those of the eye, and require the same nice discrimination of the true surgeon. And if we fail to detect the abnormal condition that produces diseased manifestations, whether of sensation or secretion, it is plainly our fault. For of all organs the uterus is now most subservient to the laws of physical exploration; and in every case of diseased action, if we cannot map out accurately the peculiar condition of the uterus producing or accompanying it, it is simply because we do not apply our knowledge of those physi cal laws to its investigation.

The treatment of dysmenorrhœa was formerly very empirical. Dewees cured many cases with his ammoniated tincture of guaiacum, but I have not seen any one who had derived the least benefit from it. The remedy is so nauseous that I could never get a patient to persevere with it. I must confess, however, that of

late years, since I have learned more intimately the nature of the disease, I have not prescribed it at all. My friend Professor E. D. Fenner,* of New Orleans, has been very successful with the bichloride of mercury in minute doses; but I have no experience with the remedy. Many prescribe belladonna and other narcotics, but they can only produce a merely palliative effect. The operation of enlarging the canal by incision is not always successful, but it is the only procedure from which I have derived the least benefit. The whole philosophy of the operation consists in opening the canal and keeping it open, so as to allow the easy passage of the menstrual flow. M'Intosh dilated the cervix with bougies; but whoever has followed him must have been struck with the uncertainty of the result, as well as with its painfulness, to say nothing of its danger. *A priori*, it would seem a trifling thing to pass a bougie along the cervix uteri, but I have known it to be followed by most serious results. In 1859, Professor Metcalfe, of New York, referred one of his sterile dysmenorrhœal cases to my care. There was slight anteversion, with a small fibroid in the anterior wall. The os was very small; the cervix long, pointed, and indurated; and the canal, though straight, was very narrow. I advised the operation of incising the os and cervix, which was objected to by the lady, although Professor Metcalfe was anxious to have it done. I explained to her the process of dilatation, and she wished to try it. Accordingly, a small bougie was passed in to the depth of two inches, and allowed to remain a few minutes. On the next day a larger one was used, and

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* *New Orleans Medical News*, 1858.

in two or three days more a conical bougie was passed, dilating the os externum to about a No. 9. She complained of a good deal of pain at the time, and there was a slight laceration of the contracted os. That night she had a rigor, followed by fever, and a most intense attack of metro-peritonitis, which lasted many weeks, and from which she barely escaped with her life. Her recovery was slow and tedious. This was my last bougie case. I have known several cases of the same sort in the hands of others in my own country, and I have seen two in Paris during my short sojourn there.

In November, 1861, in Paris, a medical friend asked me to see a case of dysmenorrhœa, which was sterile after a marriage of eight or nine years. The os and cervical canal were very small; the cervix long, pointed, and indurated. It was just the case for an operation, or there was nothing to be done. I advised him to incise the cervix. He was afraid of it, and a year afterwards he introduced a screw bougie made of ivory deprived of its earthy constituents, which was allowed to remain in the cervix, and dilate it mechanically by absorbing moisture, and expanding to twice its original size. A violent attack of metro-peritonitis was the consequence, and I saw this lady when she had been ill about a week. She had a pulse of 140, and continued in a very dangerous condition for a long time, but eventually recovered.

The other case of metro-peritonitis from mechanical dilatation occurred in the hands of one of the most eminent physicians in Paris. Fortunately the lady recovered after three weeks of fever, attended with very great suffering.

This experience warns against merely mechanical

dilatation. But it may reasonably be asked, "Is it more dangerous than splitting up the neck of the womb?" I answer, "Yes." I cannot now say how many hundreds of times (certainly more than five hundred) the operation of cutting open the os and cervix has been done by Dr. Emmet and myself at the Woman's Hospital and in private practice, and I now remember but a single instance in which it was followed by inflammatory symptoms, and this resulted in pelvic cellulitis and abscess. The case was badly chosen for operation, and if I had known that this patient had had a pelvic abscess once before, I certainly should not have operated on her. The house-surgeon of the hospital inadvertently overlooked this part of the history of the case, and hence the accident.

Some prefer to dilate the cervix by sponge tents. Foremost amongst these stand the distinguished names of Bennet and Tilt. I have tried this method, and the results were anything but satisfactory. Professor A. K. Gardner, of New York, has used it most extensively and perseveringly, but has now abandoned the practice as unfruitful. Dr. Tilt thinks the incision of the cervix "an unjustifiable operation," * and objects to it because it produces pain and "flooding to an alarming, if not to a fatal extent." As to the pain, I am sure I have seen far more caused by a bougie than I ever saw by the operation. Indeed the operation is not a painful one. I have often performed it on delicate, timid women, who were conscious that something was being done, but had no idea that it was a surgical operation. I am opposed to operating on any rational being without first explaining what is to be done, and the wherefore. In the cases

* "Uterine Therapeutics," p. 255.

alluded to the operations were performed at the suggestion and earnest wish of husbands, who feared that they might not be submitted to if fully explained.

In 1858 I advised this operation in a case of dysmenorrhœal sterility, sent to me by Dr. Vanderpoel, of Albany, New York. There was anteflexion, with slight hypertrophy of the anterior wall, curved canal, and contracted os. The Doctor had tried the bougie system for some time without any permanent improvement, and, fully satisfied that an operation was necessary, he sent his patient to me. But the very idea of cutting was so terrible to her imagination that she went to another physician, who pronounced the operation "butcherous" and dangerous, and promised to cure her by dilatation alone. Of course this poor frightened, nervous sufferer gladly accepted the alternative, and at once placed herself under his treatment. She remained in New York for several months, undergoing daily dilatation, and then returned home without any permanent benefit. Three months afterwards she consulted me again, and on examination I found the uterus just as it was seven or eight months before. Being now fully convinced that the operation afforded the only hope of relief, she submitted to it. When it was all over she could hardly believe it, and declared that she suffered more each time the bougie was used than she did from the operation.

But so far as mere pain is concerned, it might be left entirely out of the question in these days of anæsthesia. When, however, we come to speak of the dangers of the procedure, I readily admit that we may debate that point. If, then, we compare the dangers of the operation with those of mechanical dilatation, I do not hesitate a moment to declare the former much the safer,

while in permanent results it is infinitely superior. For while I have frequently known pelvic cellulitis to follow the use of the bougie and the tent, I have never seen it but once after the operation; and while the bougie and the tent can only produce temporary improvement, we know that the operation is often followed by a perfect and persistent cure. But it may be asked, is there no risk in the operation? The only trouble that I have encountered is hæmorrhage; but that was in my early operations, and before experience taught me that there was any danger to be apprehended. Now, however, I have no such accident, because I take pains to guard against it. When Dr. Simpson first published on the subject, he said he never had hæmorrhage or other unfavourable result, either directly or secondarily; so that I was emboldened to perform the operation at my house, and allow patients to ride home afterwards. But I was soon undeceived on this point, for in the short space of two months I had five cases of hæmorrhage that were truly alarming. One occurred in a lady residing in Jersey city, who rode a distance of five miles in stages after the operation. The bleeding began just as she arrived at her home. She was, of course, very much alarmed, and sent immediately for me, and also for her family physician, who, being near by, soon arrived, removed the dressing, retamponed the vagina, and arrested the bleeding promptly, before I made my frightened appearance. The other cases, though nearer to me, were equally alarming. I then made up my mind never again to operate on patients in the consulting room. I asked Dr. Simpson, when I was in Edinburgh in August, 1861, if the operation was still as safe in his hands as he had at first represented it, telling him, at

the same time, my experience, when he declared that he never had any trouble from bleeding.

How to account for this difference in our experience I could not imagine, unless it should be that I cut more extensively than he did. To satisfy my mind on this score Dr. Simpson kindly invited me to witness the operation in his hands. It was the case of a lady from some of the British possessions. The os was small; the canal narrow; the cervix long, pointed, and indurated. It was precisely the case to justify the operation, for the gristly induration of the cervix rendered any other method quite out of the question. The operation was performed with the Doctor's usual dexterity. Then a camel's hair pencil, saturated with a solution of the perchloride of iron, was thrust into the vagina two or three times, and in ten or fifteen minutes from the time we entered the lady's apartment, we were in the street making other visits. He had such confidence in the operation and in his styptic that he did not wait for consequences. Before the operation, he requested me to examine the condition of the cervix uteri by the touch, and I found it as already described. Afterwards I repeated the touch, and found the cervix as thoroughly divided from the os externum to the os internum as it was possible to do it, proving that the difference in our experience as to hæmorrhage did not depend upon any difference in the extent of the operation. I do not pretend to account for the fact, that the operation is not followed by hæmorrhage in Scotland while it is in America; and I would warn my own countrymen to take every precaution against its occurrence, as it is almost the only accident that can attend this operation.

I may be pardoned for pressing this subject a little

further. I look upon this operation, simple as it is, as one of the great surgical advances of the day; and I am so well satisfied of its merits, that I would warn young men to be careful not to bring it into discredit by permitting an accidental complication that should never under any circumstances be allowed to take place. I know a most talented, promising young physician in my own country, whose reputation was well nigh ruined by blindly following authority, and operating with the belief that there was no danger from bleeding. Having been taught to look upon the operation as a trifling one, devoid of all risk, he unguardedly operated on his patient at his own house, and allowed her in a few hours afterwards to ride home, a distance of four or five miles. Hæmorrhage unfortunately supervened; the doctor was sent for; he was not at home. Some time elapsed before he could be found, and when he reached his patient she was in a collapse from loss of blood from which she never recovered. This is the only well-authenticated case of death from hæmorrhage that I have known to follow this operation. Of course it could not have happened but for the overweening confidence of the surgeon in the innocuousness of the operation, and it should never happen again. Such an accident as this may be smothered up in a great city, but if it occurs in the hands of a country practitioner, it may wholly ruin him for ever.

The case above alluded to happened in a small country village, and the public excitement may be imagined when everybody began to discuss the subject, and to censure a noble young physician for causing the sudden death of a citizen who was supposed to enjoy the most vigorous health. An eminent professor of obstetrics testified that the operation was a recognized

justifiable one; that it had been well done, and that death was the result of a rare and unexpected accident. This testimony was corroborated by others, and thus the popular indignation was appeased, and the young practitioner reinstated in public confidence.

But it may be asked, is there no other danger? I can only here reiterate what I have before stated, that out of the hundreds operated on in the Woman's Hospital and in my private practice, I have seen but the one case of pelvic cellulitis already noticed, which is the only risk of the operation that I know of. While this has occurred but once in my hands from the operation, it has happened frequently under my observation as the result of mechanical dilatation by bougies and sponge tents.

The position I take is this: that, as a rule, the operation is less painful than the use of the bougie, which must be repeated for months; that it is entirely devoid of danger from hæmorrhage, provided we exercise ordinary prudence in the after-treatment; that it is less frequently followed by pelvic inflammation than either the bougie or the sponge tent; that it is more certain and permanent in its results than either or both; and that, if we exclude it, there are great numbers of curable cases which would be placed beyond the pale of treatment. Thus, from my stand-point of view, the operation, when indicated, is always to be preferred to any and all other means of enlarging the cervical canal.

I am surprised to find that this operation is so seldom performed in Great Britain out of Edinburgh. In London it is condemned by the great body of the profession, although performed by several eminent men. But where we find one man to uphold it, we may point to

scores who oppose it. This cannot long remain so; for where honesty, intelligence, and earnest inquiry reign supreme, as they do here, the truth must and will prevail.

On the Continent, so far as I know, this operation is almost completely ostracized. When I went to Paris in September, 1862, a lady of very high position asked my opinion in reference to her sterility. She had been married thirteen years without issue. On examination, I was convinced that conception could never by any possibility occur unless the neck of the womb were well opened by incision. All sorts of mechanical dilatation had already been fruitlessly employed, producing metro-peritonitis, and leaving the os and cervix as contracted as at the beginning. When the husband asked me, "What are the risks of the operation?" I replied, "In America or England nothing but hæmorrhage, and that we control. I cannot say what they would be in Paris, for here you have erysipelas often following the most trifling wounds. Ask your own surgeon about it." They sent for my friend Professor Nélaton, who said that in France the operation would be attended with great risk to life. Such a decision from such an authority of course put the operation wholly out of the question for the time being. However, soon after this I had the good fortune to meet Sir Joseph Olliffe, who invited me to perform the operation on one of his patients in the upper ranks of life. When I told him what I have related above, he said he was perfectly familiar with British and American literature on the subject, and knowing the safety of the operation, would assume all responsibility in the matter. This operation, the first of the sort that I did in Paris, was performed on the 31st of October, 1862, for Sir Joseph Olliffe.

His patient recovered without the slightest trouble; and on the 2nd of December we operated on the lady whose case was first mentioned. To guard against any risk from the atmosphere of Paris, we went to their château, not many leagues from the city. The case got well rapidly, as usual, and conception fortunately occurred seven or eight months afterwards. She is now (September, 1865) the happy mother of two beautiful children, —one a boy, sixteen months old; the other a girl, less than a month old; and this after a sterile marriage of thirteen years. I am a little minute in this merely historical part of the introduction of the operation into France, for I wish to show that it may be done as well and as safely there as elsewhere.

My third case was that of a native, and I went with her to the country to perform the operation. The next was an American, operated on in Paris; then another American; and then I began to operate on natives of France, and in the city of Paris, with the same fearlessness that I did on Americans.

I may be excused for these minute details; for as the operation was condemned by the highest authority in France, it was important, not so much for myself as for the advancement of surgery, that I should exercise every precaution to guard against accident or untoward results. I have performed this operation twenty-four times on the Continent without accident, except the occurrence of hæmorrhage in one case on the sixth day after operation, which was promptly controlled by Sir Joseph Olliffe in my absence. My patients varied in age from twenty-two to forty. They were natives of France, Vienna, Frankfort, England, Scotland, Ireland, and the United States. The operations were performed in the autumn, winter, spring, and summer. Twenty

were done in Paris, two near Paris, and two at Baden; and in all there was the same rapid and safe recovery from the effects of the operation as I had always seen in New York. Of course this small number of successful operations is not enough to establish fully its acclimatization and its claims to universal favour there; but they are certainly sufficient to attract the notice and consideration of the profession in France.

But we were speaking of painful menstruation and its almost invariable concomitants, contracted os and narrowed cervical canal; and having said so much in a general way about the various methods of overcoming these, we may now proceed to discuss the plan of operating, together with the after-treatment necessary to protect against hæmorrhage and to ensure a patulous canal.

For the operation of incising the os and cervix uteri, we are indebted to Dr. Simpson. His method is followed by most operators, both in my country and in this. He places his patient on the left side, introduces the index finger of one hand into the vagina, pushes the fundus uteri up if it be anteverted, passes his uterotome (fig. 51) along the cervix through the os internum, springs the blade, and withdraws the instrument, cutting open one

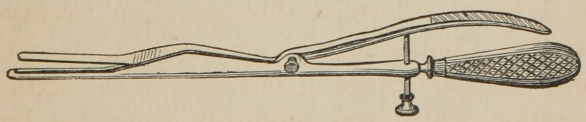

Fig. 51.

side of the cervix; then reintroducing the instrument, the other side is cut in like manner; thus making a bilateral incision of the cervix large enough to allow the index finger to be passed to the os internum; and, as

before stated, he then passes into the vagina a large camel's-hair pencil, saturated with a solution of the perchloride of iron.

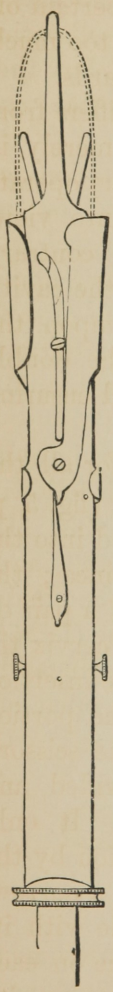

Fig. 52.

Dr. Greenhalgh has modified Dr. Simpson's instrument by giving it two blades, which cut through both sides of the cervix at once, thus ensuring an equilateral uniformity of section that cannot always be predicated of the single-bladed instrument. His instrument (fig. 52) is a masterpiece of ingenuity, and answers well in his practised hands. But I object to both these methods, because they are done in the dark, and too much is left to the execution of a machine instead of the judgment of the surgeon.

Suppose it were necessary to amputate an elongated uvula,—by no means an uncommon operation,—would it be judicious to run one finger down the throat and guide by it some machine for performing the operation in the dark? Or would it be more surgical and more precise to look into the throat, seize the part with a proper appliance, and amputate it where our judgment would determine to be right and best for the individual case? There are operations that must be done by the touch alone; but we never select this plan if it be possible to aid the manipulatory process by the sight.

Besides the objections already urged against instruments of this class, there is another to which all instruments on the principle of cutting from

above downwards are obnoxious—viz., that as the uterus is not fixed, it may glide upwards to some extent by the mere centrifugal force of the expanded blade or blades, and thus we can never feel altogether certain of the length and breadth of the cut. Whether too much or too little, it is not safely remediable afterwards.

The operation, as I prefer to perform it, differs from Dr. Simpson's, not in its aim and scope, but merely in its mechanical execution. He and his followers operate in the dark; I bring everything plainly into view. They cut from within outwards; I, in the contrary direction, from the os externum upwards to the cavity of the womb. They, as a rule, do not tampon the vagina after the operation; I always do, for the double purpose of guarding against hæmorrhage and ensuring an open os.

I place the patient on the left side, as for all the operations in uterine surgery. The speculum (fig. 5, p. 18) is introduced; a small tenaculum is hooked into the central portion of the anterior lip of the os tincæ; the uterus is gently pulled forwards; one blade of a pair of curved scissors is passed into the canal of the cervix till the outer one comes almost in contact with the insertion of the vagina on the side of the cervix, and the portion thus embraced is divided at one blow of the scissors. Then the opposite side is in like manner divided, and the operation is almost finished (fig. 53). It only remains, while the uterus is still held in position by the tenaculum, to sponge away the blood, and pass a narrow-bladed, blunt-pointed knife (at a proper angle with its handle) and divide the small amount of tissue on each side) leading from the scissor-cuts up to the very cavity of the womb. The scissors never cut the whole amount of tissue embraced between the blades. They will spring

back a little, making only a deep notch on each side of the os. The advantage of cutting the edges of the os with

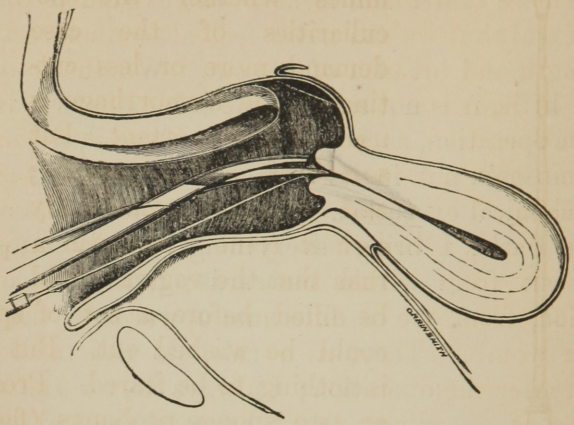

FIG. 53.

scissors is that we make the incisions perfectly equilateral and symmetrical.

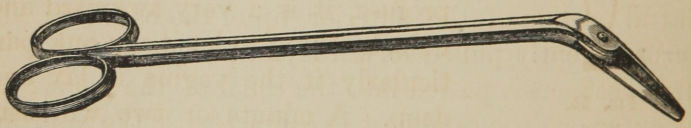

FIG. 54.

[I now often use scissors with short straight blades, but curved above the joint, as here shown.]

Fig. 55 represents the knife with the blade in proper position for cutting the left side of the canal. To cut the right side, it is necessary to turn the blade in the opposite direction, as shown by the dotted line. The blade may be fixed firmly at any angle by the screw at the end of the handle, which drives a shaft up into little holes, as seen in fig. 56, where the razor-shape of the blade is also shown. The operation is quickly

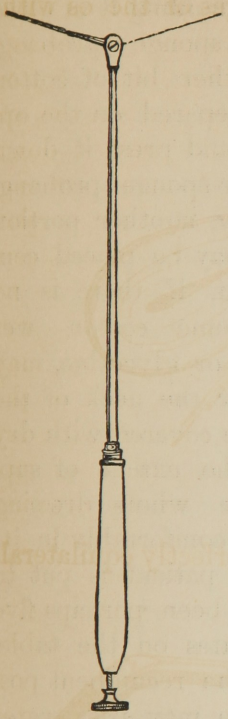

Fig. 55.

done, and the judgment of the surgeon determines whether the peculiarities of the case demand more or less cutting. The hæmorrhage is usually unimportant, but sometimes it is profuse; and I have occasionally seen it come with such a rush that the vagina would be filled before a set of sponges could be washed out. But there is nothing to be feared. Press one or two sponge probangs (fig. 57) right into the neck of the uterus, but at the same time be sure to keep the organ firmly fixed by the tenaculum; for if the bleeding be profuse, it is a very awkward and unlucky thing to let it slip out, particularly if the vagina is lax and deep. A minute or two will usually suffice to control the bleeding by the pressure of the probangs. When that is done, the dressing may be proceeded with. Two or three small pieces of cotton, large enough when moistened to fill up the gaping os, are to be thoroughly saturated with water, then squeezed as dry as possible, and afterwards wetted in a mixture of one part of Deleau's neutral solution of the perchloride of iron with four or five parts of water, or in Dr. Squibb's liq. ferri persulphatis similarly diluted. Squeeze out the superfluous fluid, and place a bit of the cotton in an angle of the wound, pressing a por-

Fig. 56.

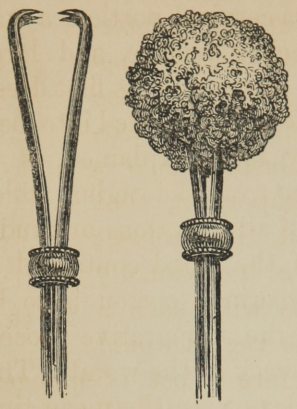

Fig. 57.

[This cut is introduced here simply to show the mechanism of the sponge-holder, and the proper size of the sponge. We often use too large a sponge to be passed with ease into the cervix. We should have a few much smaller than this.]

tion of it up into the cervical canal, and holding it in place with the sponge probang. Apply another bit of cotton similarly prepared on the opposite side, and press it down with another sponge probang. If necessary, another portion of cotton may be placed centrally; then, if there is no bleeding, some cotton wet with water or glycerine, may be laid over the neck of the womb, to be covered with dry cotton to the extent of supporting the whole dressing neatly and comfortably in its place. The patient is put to bed, having been perhaps five or six minutes on the table. She eats and drinks as usual, but the recumbent posture is enjoined for a few days. She may pass water lying, or it may be drawn off. The only object of the recumbent posture is to ensure the retention of the dressing *in situ*. I formerly allowed my patients to sit up and walk about the room the day after the operation; but I was so often annoyed by the supervention of hæmorrhage that I at length adopted the plan of keeping them down till the spontaneous separation of the intra-cervical dressing.

On the day after the operation, the whole of the vaginal portion of the tampon is to be carefully removed; placing the patient in the position as for the operation, and using the speculum, which must be introduced so as

not to derange the relations of the dressing. When it is all removed down to the intra-cervical portion, a wad of cotton saturated with Price's glycerine, and large enough to cover completely the cervix and its first dressing, is laid over it, and the patient again lifted into bed. The action of this, as already fully explained, is to induce a profuse watery discharge from the vagina, which keeps the part cleanly drained of all secretions or exudations from the decomposition of the blood contained in the original dressing. This glycerined cotton is to be removed and renewed daily till the suppurative process throws off the dressing from the neck of the womb. This will not be under three or four days. In the mean time the glycerine, by its detergent and antiseptic properties, keeps everything sweet and clean; and its affinity for water, which by osmosis it extracts from the tissues with which it lies in contact, keeps the parts entirely clear of any secretion that might be re-absorbed and poison the blood, if not thus drained off by the chemico-capillary action of the dressing. No one can thus apply glycerine to the neck of the womb and not be struck with its peculiar power and properties. The intra-cervical dressing will be loosened on the third day or later, and it may then be gently removed with forceps. If it adheres obstinately, let it alone, but cover it and the whole cervix with the cotton glycerole, and at the next dressing it may come away easily. I have frequently provoked bleeding by a little impatience in removing it prematurely. When it is once safely out, then the cervix is to be plugged with a small bit of cotton glycerole, and the whole covered as before with the same. This dressing is to be renewed daily till the parts have entirely healed, which usually takes from twelve to seventeen days, or perhaps till the recurrence of the next menstrual period.

And this reminds me that the operation should always be performed within from three to five days after a menstrual epoch, so that we may have time enough for the healing process to be wholly completed before the recurrence of the next period.

There is sometimes great trouble in keeping the mouth of the womb sufficiently open. It never remains just as we cut it. The tendency of all cicatrizing wounds to contract as they heal is wonderfully illustrated here. I have often been amazed to find the os contracted in a month to one-fourth of the size of the original incisions. I have frequently seen it cut open large enough to admit the index-finger up to the os internum, and then close in a few weeks to such a degree as not to admit a No. 4 or 5 bougie, and this in spite of persevering efforts to prevent the contraction. This is the case where there is great induration of the cervix, with deposits of fibrous tissue. I have frequently been compelled to repeat the operation, and I remember several patients upon whom I have operated as often as three times in the course of a few months, and even then the result was not wholly satisfactory. These may be called exceptional cases, but it is well to know that they are not very rare. Even when the os tincæ remains open enough, we may have some trouble in keeping the contracted portion above of normal dimensions. This may be the case if there is much of a flexure, particularly anteriorly. And here I would recommend the occasional passage of a bougie after the first week. Dr. Emmet is in the habit of using the sound as early as the third day after the operation, passing it into the cavity of the womb, and pressing it pretty firmly first against one side of the canal and then against the other in withdrawing it. I have in a few cases followed his example, but with a little timidity.

Dr. Greenhalgh uses a self-retaining intra-uterine stem, which is very ingenious, and answers well in his hands. Dr. Priestley's instrument* (fig. 58) may be found useful under these circumstances. Introduced as an ordinary sound, it is then dilated as shown in the cut.

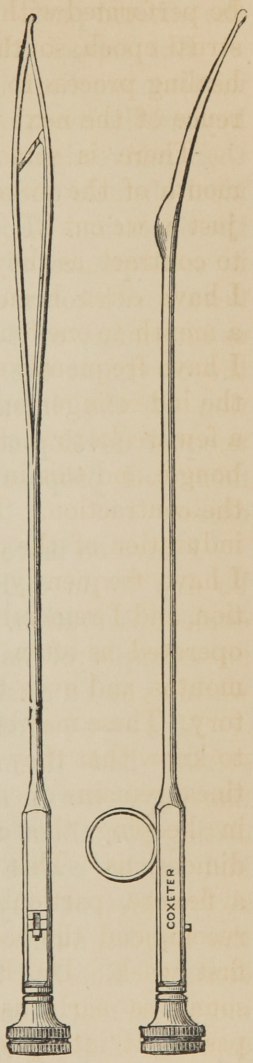

FIG. 58.

Incision of the os often cures dysmenorrhœa; sometimes it only modifies it. And again, I have seen cases where it produced no beneficial effect whatever. The first menstrual flow after it is usually ushered in without the premonitions that had so long harassed the poor sufferer, and she may pass through the whole period with comparative comfort; but I think it advisable for such patients to take very good care of themselves at each return of the flow, and to avoid all unnecessary exposure or fatigue. If there is pain enough to lie down, I direct an anodyne by the rectum, and for this purpose McMunn's elixir of opium is the very best. It is less apt to nauseate or to produce headache than crude opium or any of its alkaloids. It is more efficacious by the rectum than by the mouth, because

* *Medical Times and Gazette*, March 5th, 1864.

it is more immediately in conjunction with the nerves of the affected part.

But suppose the bilateral incision produces no permanent amelioration, are we to give up the case as beyond the reach of surgery? By no means. We must then reinvestigate; for there may still be some mechanical obstacle undetected, or, if detected, unrelieved by the operation. For instance, dysmenorrhœa may persist in consequence of an undetected polypus, or of acute flexure with contraction of the canal of the cervix at the os internum; or it may be the result of a curvature of the cervix, at the insertion of the vagina, with elongation of the intravaginal portion, and a consequent unequal development of its anterior and posterior segments. I propose to give examples of each of these classes.

I have on more than one occasion found the pain to be due to an undetected polypus, so diminutive as to elude observation. A single illustration will serve as an example of its class, and at the same time be a warning and a guide to the inexperienced.

Mrs. ——, aged thirty-two, married at twenty-four, sterile, had dysmenorrhœa for some years before marriage, worse after. Her sufferings were excruciating for about two hours on the second day. She had in the course of twelve years been treated by sixty different physicians without permanent benefit,—the largest number I ever knew any one person to consult. She had been under the care of many of the most eminent men in at least five or six of the great capitals of Europe, besides her consultations at home. I saw her in January, 1857. Her general health was good; her only trouble seemed to be the much dreaded dysmenorrhœa.

The uterus was of normal size and in proper position. Os and cervix both small, but not indurated. I resorted to the sponge tent, but found no polypus, no fibroid, and no flexure of the canal. Three days after (January 12), the os presented precisely the same appearance that it did before the use of the tents. The next menstruation was quite as painful as usual, if not more so. As the canal was straight, and the cervix soft, I would hardly have expected severe pain, although the os was rather small. Yet I did not know what else to do but to incise the os and cervix, hoping that some benefit might be derived from it. Accordingly, the operation was performed on the 22nd January, and the parts were healed before the next menstrual period; but the pain was still the same, and so continued for three or four months, in spite of treatment. I was now quite perplexed. I had used the sponge tent and found no polypus. I had then enlarged the cervical canal without the least improvement; but the symptoms were so evidently those of mechanical obstruction, that I concluded to make another exploration of the cavity of the uterus. I accordingly introduced a small sponge tent, and on its removal I passed another, larger and long enough to enter the cavity of the womb. On its removal, I had the satisfaction of finding and bringing away a polypus, which was but little larger than a common garden pea. Its attachment and relations, represented in the diagram (fig. 59), suggest at once the rationale of the symptoms.

The violent agonizing pain always supervened on the second day of the flow. When I first felt the tumour, it was protruding through the os internum after the removal of the tent; but by the pressure

of the finger it suddenly slipped upwards, and I could not touch it again till the finger was gently forced through the os internum to the fundus, when I fortunately seized it with forceps and brought it away.

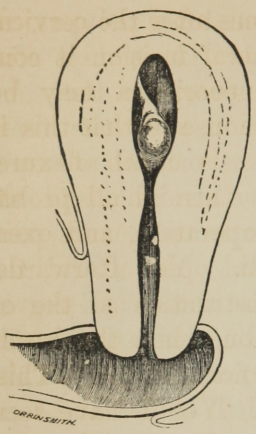

Fig. 59.

My explanation of the pain is this—By the second day coagula formed above the tumour, which pressed it downwards, its slender pedicle yielding till it blocked up completely the os internum just like a ball-and-socket valve. Then would come the violent neuralgic throes continuing for two hours or more, till the tumour either dilated the contracted part, or was compelled to retreat again into the uterine cavity by displaced coagula driven between it and the posterior face of the uterus by the expulsive efforts of the organ.

The case illustrates the necessity of a very thorough investigation before a correct diagnosis can always be made out in obscure cases. The leeching, the physicking, the blistering, the anodynes, the baths, the mountain excursions, the sea-bathing and sea voyages that this poor patient suffered and endured for years are almost incredible. As contemptible as the little polypus was, it took me nearly four months (shall I say?) of empirical observation to find out that it was the source of all the mischief.

It is now plain enough, but the difficulties of diagnosis may be appreciated when we remember the history of the case and the great number of dis-

tinguished physicians who were baffled in their honest efforts to elucidate it.

I have already said that sometimes after the cervical canal is freely opened by the bilateral incision it contracts again, and the pain of dysmenorrhœa may be just as severe as before the operation, and that this is more apt to be the case if there is much flexure, particularly anteriorly. We shall then in all probability be compelled to repeat the operation, and exercise greater care in keeping the canal open afterwards. We may occasionally find the obstruction at the os internum with flexure and contraction, while the lower portion of the canal may be of normal size. This, however, is by no means common. Yet I have seen several examples of it. Its most perfect type I found in a patient of Sir Joseph Olliffe. This lady was about thirty-six years of age, and had suffered from painful menstruation most of her menstrual life. Sir Joseph had dilated the os externum and the cervix up to the os internum, but had never been able to pass a sound through this. One of the most eminent surgeons of Paris saw her in consultation with Sir Joseph about four years ago, and, failing to pass the sound, proposed to enlarge the contracted portion by the use of the actual cautery! This treatment was not carried out, and on my arrival in Paris, in the fall of 1862, Dr. Olliffe kindly invited me to see her. I found the fundus lying just behind the inner face of the symphysis pubis, with quite a sharp flexure at the os internum. The sound could be easily passed to the os internum, where it met with an unyielding barrier, and I was obliged to have a small one made, quite probe-like, just to suit the case; and even this could not be passed with the patient on the back; but by placing her on the

side, using the speculum, and fixing the cervix with a tenaculum, it passed into the uterine cavity seemingly through a dense inelastic ring of fibrous tissue, which resisted not only the ingress but the egress of the olive-shaped point of the probe. I at once agreed with Sir Joseph's opinion that an incision of the part was the only safe and speedy method of overcoming the difficulty. The neck of the uterus was split bilaterally, just as if it had been contracted all the way to the os tincæ. When we came to cut the gristly circular band at *a* (fig. 60), the blunt-pointed knife was passed through it with some little difficulty, and the cuts on each side were attended with the peculiar creaking sensation that we experience in cutting through cartilage. The wound was treated in the usual way, as previously laid down, and all was well by the time of the next menstruation. The os internum was, after the fourth or fifth day, forcibly pressed open laterally by the sound, as practised by Dr. Emmet.

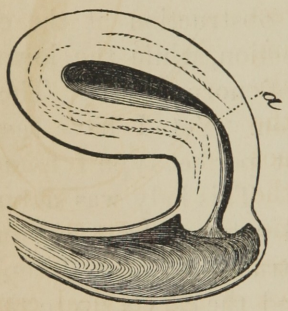

Fig. 60.

But the pain of menstruation may continue even after all our best efforts to enlarge the os internum as well as the cervical canal by the bilateral incision. It is then often the consequence of curvature, with elongation of the vaginal portion of the cervix, accompanying anteflexion. When this is the case, we shall find the os tincæ looking in the direction of the axis of the vagina, the posterior portion of the cervix from the os tincæ to the posterior cul-de-sac being two or three times as long

as the anterior, measuring from the os to the anterior cul-de-sac. I have repeatedly performed the bilateral operation on such cases as this without improvement, and for the best of reasons. If we take a flexible tube the size of the cervical canal, and curve it as represented by the diagram (fig. 61), it flattens out laterally, and the inner concavo-convex surfaces, necessarily brought into close apposition, present an almost valvular mechanical obstacle to the passage of a fluid in either direction. By referring to the diagram, it will be seen at once that a bilateral incision could only widen the canal a little transversely, but not at all antero-posteriorly; that the curvature would remain the same, and consequently the distances between the two opposing surfaces of the cervical canal would in no way be modified by such operation. Having so often failed, under such circumstances, to afford the relief anticipated from the bilateral incision, I at last devised and practised the following method. To remove the flexure of the canal would be to remove the obstacle to the easy passage of the menstrual flow. To do this, it is only necessary to split the posterior portion of the cervix from the os tincæ in a straight line backwards, nearly to the insertion of the vagina, and thus the canal of the cervix is made to run in a straight line from the cavity of the uterus to the terminus of the incision at *a*, instead of curving round to the os tincæ. The method of doing this is very simple. The patient as usual on the left side; the speculum introduced; the anterior lip of the os tincæ is held by the tenaculum, as

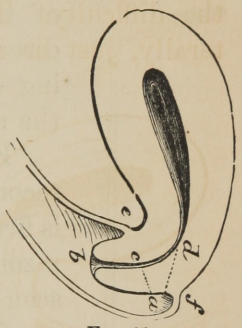

Fig. 61.

so often described; and then with a straight pair of scissors the posterior portion of the cervix is split at one blow, as far as can be easily and conveniently done by scissors, which would be about as far as represented by the dotted line *a c*, fig. 61. Then the blunt-pointed knife (fig. 62), bent at a proper angle with its shaft, and cutting backwards, is passed up to the cavity of the uterus, and the parts cut in the direction of the line *a d*, thus straightening out the canal, and thereby removing the mechanical obstacle due to its flexure.

Fig. 62.

Fig 63 is intended to represent the second stage of the operation. The uterus is firmly fixed by the tenaculum, while the razor-shaped blade of the blunt knife is seen in the act of cutting the canal backwards. The case is to be treated on the same general principles laid down for the management of the bilateral operation. There is some little care necessary to avoid cutting through the vaginal cul-de-sac into the peritoneal cavity—an unpardonable blunder that no true surgeon could possibly make. The operation has succeeded admirably in these cases, but is wholly inapplicable except in just such cases as the one above described. I have often performed the operation in this way, and my colleague, Dr. Emmet, has repeated it more frequently than I have; for the relief it affords is a great temptation to its performance.

In operating for dysmenorrhœa, we must not lose sight of doing it in such a way as to favour the chances of conception. How often do we hear even medical

men say, "If she could only have a child it would cure her." To this I always feel inclined to reply, "If we

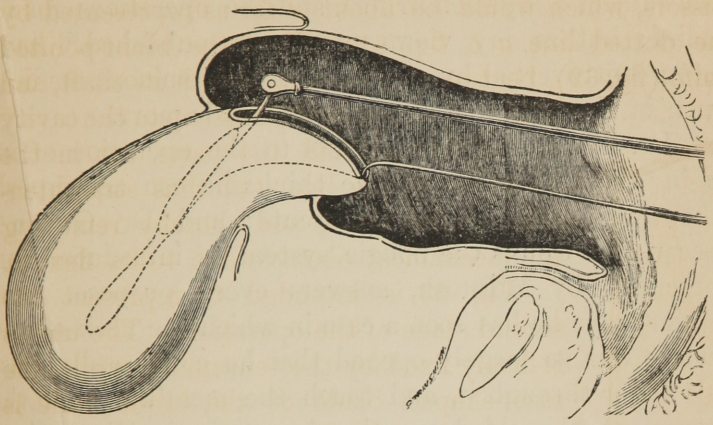

Fig. 63.

could only cure her, she would have a child." We should remember that the physical causes that obstruct the easy egress of the catamenia, likewise obstruct the easy ingress of the spermatozoa; and to remove the one is in some degree to relieve the other. If an inflamed, turgid cervical mucous membrane is a mechanical barrier to the passage from one direction, it is equally so to it from the other. If a contracted os shuts the door to an outlet, it closes it equally to an inlet. If a cervical canal, flexed to such a degree as to bring its opposite walls into close contact, will produce the pain of dysmenorrhœa, it will as certainly prevent the pain of parturition, but only by preventing conception. Thus, to treat dysmenorrhœa successfully, is to treat many, but by no means all, cases of sterility successfully. Those who have adopted the operation of enlarging the canal of the cervix for the cure of dysmenorrhœa, seem satis-

fied to rest upon it alone for the relief of sterility. But more remains to be done.

It would seem that I have already said enough on the subject of dysmenorrhœa, and the operations for its relief; but as my views previously published* have been controverted by some of the most eminent medical men in England, I shall say a few words more.

Dr. Henry Bennet† objects to the operation of incising the cervix, because he thinks he can accomplish the same result by sponge tents; and Dr. Gream,‡ because he thinks the bougie system, as introduced and practised by M'Intosh, answers every purpose. Dr. Gream says he has seen a case in which the neck of the womb was so largely opened that he could easily pass his finger through it, and touch the membranes of the ovum, at the third month of gestation. His patient aborted soon after; and he thinks the abortion was not the result of passing the finger into the cavity of the uterus, but of the inability of the organ to retain its contents, in consequence of the extensive division of the circular fibres of the cervix.

This is, I admit, a very rational inference; at all events we must accept the fact, and inquire into its cause. Mr. Spencer Wells§ advocates the operation, but says he has seen several cases in which the cervix was too largely incised, and the lips of the os tincæ were in consequence everted, rolled back, and almost lost in the insertion of the vagina. This is certainly a very grave objection to the operation of bilateral incision. But I have never seen this accident after the operation,

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* *Lancet*, March 4th and 11th, April 1st, and June 3rd, 1865.
† *Lancet*, June 24th, 1865. ‡ *Lancet*, April 8th, 1865.
§ *Lancet*, May 27th, 1865.

as performed by my method, and, as before stated, Dr. Emmet and myself have done it several hundred times.

Let us, then, inquire why it occasionally follows this operation in the hands of English surgeons and not in ours. At first I was disposed to believe that the gentlemen alluded to above had encountered unique and isolated cases; but upon inquiry I am now convinced that this accident does occasionally follow the use of the metro-tome caché. It is well to know this fact, so as to guard against its occurrence.

A short time ago, a friend invited me to see a case of fibroid of the uterus, attended by severe hæmorrhages, in which he had divided the cervix after the plan of Mr. Baker Brown. The operation had been done by some one before, but the bleedings continued, and my friend, desirous of giving the operation a fair chance, determined to make a more thorough division of the cervix, for which purpose he set the blades of the metro-tome caché very widely, so as to cut deeply. The consequence was a complete division of the cervix through the whole of the circular fibres, from the os tincæ quite to the cavity of the uterus, which produced the deformity that Mr. Spencer Wells speaks of. After seeing this case, I could no longer doubt. Why does this accident happen after the metro-tome caché method of operating, and not after my plan? The reason is obvious enough, if we consider the difference in the two methods of operating. To illustrate this, let the diagram (fig. 64) represent the natural size of the uterus. This outline is taken from Dr. Savage's* picture of a dissection of a uterus of natural size. I have made

* "Illustrations of the Surgery of the Female Pelvic Organs." By Henry Savage, M.D., Physician to the Samaritan Hospital for Women. Plate 8, fig. 3.

the cervix project a little more into the vagina, as we

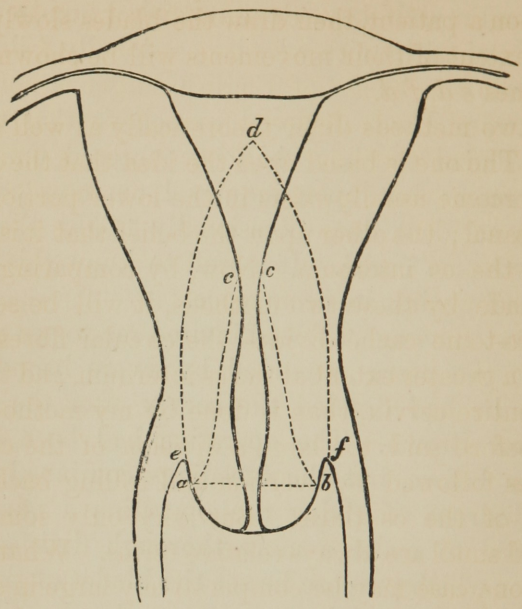

Fig. 64.

usually find it so in the majority of cases requiring operation.

According to my plan of operating, the dotted line *a b* would represent the proportion of cervical tissue divided by the scissors (page 156), while the dotted lines *a c*, *b c* would represent the extent of the incisions made by the blunt-pointed knife (fig. 55, page 157) up towards the cavity of the uterus. Now, upon this same diagram, let us see what would be the nature and extent of the incisions made by the metrotome caché. We will take Dr. Greenhalgh's instrument, as now made in London by Weiss, and in Paris by Charrière, as being the safest and best of its class. Lay it down upon this diagram, with the point at the fundus *d*, and the shoul-

der at the os tincæ, hold it firmly as we would in operating upon a patient, then draw the blades slowly down, and the extent of their movements will be shown by the dotted lines *e d*, *f d*.

The two methods differ theoretically as well as practically. The one is based upon the idea that the obstacle to be overcome usually exists in the lower portion of the cervical canal; the other upon the belief that it is always found at the os internum. Now, by comparing the incisions made by these two methods, it will be seen that the metro-tome caché divides the circular fibres of the cervix to a greater extent at the os internum, and throughout the entire cervix, than is done by my method.

As before said, too large a division of the cervix is sometimes followed by eversion and rolling back of the two lips of the os tincæ. But why only sometimes? Large and small are always relative terms. What may be small in one case may be comparatively large in another. The metro-tome caché cuts so much whether the cervix be large or small. We know very well that the size of the cervix varies greatly in the unimpregnated uterus, and that in the class of cases requiring this operation, it is sometimes less than an inch in diameter. Now, if we use an instrument that cuts more than this, it must of necessity cut through the cervix from side to side; and hence the danger of the accidents that are said to sometimes follow this operation.

I have seen, in several shops, metro-tomes that could be opened from one and a half to two inches. I am not going out of the way to caution my younger brethren against machines of this sort, when I call to mind the fact that a friend of mine recently used one of them, and was afterwards glad to see his patient ultimately recover from the serious consequences of his rashness. If we

must use a metro-tome caché, let us take Dr. Greenhalgh's, with its maximum expansion, as shown in the diagram above.

But why do the lips of the os tincæ roll back when the cervix is too extensively incised? The rationale is this: The longitudinal fibres of the uterus run down from the fundus to be inserted or incorporated antero-posteriorly with the circular fibres of the cervix. These two sets of muscular fibres are antagonistic in their action physiologically. In a normal labour, the contraction of the longitudinal fibres of the body must be accompanied or followed by a relaxation of the circular fibres of the cervix, or the labour could not be finished. They are as antagonistic as are the flexors and extensors of the hand. Destroy the power of the one set of muscles, and the other will inevitably take on a tonic contraction, and draw the hand in the direction of the line of their action. In the operation of dividing the circular fibres of the cervix uteri by the metro-tome caché, if the whole diameter of the cervix be cut entirely through, we must of necessity cut the whole of its circular muscular fibres, which destroys their contractility, and removes the force that bound, as it were, in a bundle the terminal extremities of the longitudinal fibres, which then take on a tonic rigidity, retracting the divided lips of the os tincæ, and producing the deformity that, we must admit, is occasionally seen to follow the metro-tome caché method of operating.

Whether my explanation be correct or not, does not in the least affect the fact under consideration; and the young surgeon cannot be too careful, for if he should unfortunately cut too much, there is no remedy for his mistake. It is far better to cut too little, even at the risk of being compelled to repeat the operation.

SECTION III.

THE OS AND CERVIX UTERI SHOULD BE SUFFICIENTLY OPEN, NOT ONLY TO PERMIT THE FREE EXIT OF THE MENSTRUAL FLOW, BUT ALSO TO ADMIT THE INGRESS OF THE SPERMATOZOA.

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In the preceding pages we have followed symptomatology to the detection and treatment of organic disease, but now we propose to ask in what particular organic structure varies from a normal condition, irrespective of rational signs? It will then be necessary to inquire into the normal conditions and relations of the uterus, before speaking of its anomalies, and their influence on conception.

Anatomists tell us that the uterus is pear-shaped, and flattened a little antero-posteriorly; that it is from two and a half to three inches long; an inch and a half wide, more or less, at its largest part; and about an inch thick; that it is divided into fundus, body, and cervix; that its cavity is from two and a quarter to two and a half inches long, the canal of the cervix being a little longer than that of the body; that the os tincæ is generally round in the nulliparous uterus; elliptical and transverse after child-bearing; and that the cervix is rounded and embraced by the vagina, which is inserted higher behind than before, thus making the posterior intravaginal portion of the cervix a little longer than the anterior. But anatomists do not tell us how far the intravaginal portion of the cervix should project into the

vagina, or what proportion it should bear to the supra-vaginal section, which, by the bye, is an important matter to determine. Not having time or inclination to go to the dead-house for the verification of this point, I shall describe the neck of the womb as I see it in daily investigations on the living. I assume that a normal os tincæ, whether round or transverse and elliptical, should be open, and filled with a slippery translucent mucus of slightly alkaline reaction; that the cervix should be rounded, truncated, and elastic to the touch; that the intravaginal portion should be about a fifth or not more than a fourth of its whole length, *i.e.*, from a quarter to a third of an inch anteriorly, and a fraction more posteriorly; that the canal of the cervix should be straight or curved slightly forward; and that the axis of the whole organ should stand at about right angles with that of the vagina, being neither anteverted nor retroverted to any great degree. Any woman with such a state of the uterus will always conceive in three or four months after marriage, if everything else is right.

Having laid down this ideal of what the womb should be, an ideal that has not been imagined, but drawn from actual observation in the clinique and the consulting-room, we shall proceed to the examination of the sterile, unimpregnated uterus, to see where and how it may differ from a normal conceptive state. This necessarily embraces anomalies or deviations from a normal state; 1st, of the mouth of the womb; 2nd, of the cervix; and 3rd, of the body: and this brings us at once to the third general subdivision of our subject, viz., that the os and cervix uteri should be sufficiently open not only to permit the free discharge of the menstrual flow, but also to admit the ingress of the spermatozoa.

It might appear, at the first glance, that this propo-

sition had been embraced, and sufficiently discussed, in the preceding article on painful menstruation. But experience teaches us differently ; for instance, how often do we see sterility where there is no symptom of disease so far as physical suffering is concerned ? Menstruation may be perfectly normal, there may be no back-ache, no vesical tenesmus, no bearing-down, no leucorrhœa, indeed, no sign of diseased action; and when we come to a physical exploration, we may even find the uterus of proper size, in a normal position, and with a straight cervical canal, but the os may not be larger than a pin's head, and if to this be added induration of the cervix, the case is almost necessarily sterile ; for while the os and cervix are capacious enough to transmit the outward flow, the os itself is not capable of admitting the sperm, and without this there can, of course, be no conception. This is not theoretical, and I might give numerous illustrations in proof, but one will suffice.

Mrs. X., of fine form and vigorous health, had been married many years (thirteen or fourteen) without offspring. Menstruation regular, normal; never had leucorrhœa, or any other symptom of uterine disease; and people wondered why such a fine specimen of womankind should not become a mother; and they very generally and erroneously inferred that it could not be the fault of such a physical organization. She consulted many eminent medical men, and took baths and mineral waters, and cordials, elixirs, and nostrums without number. She had submitted to be bougied till an attack of pelvic cellulitis supervening had well-nigh cost her her life. Indeed, I never saw any woman so determined on having offspring, and for that purpose she was ready to suffer anything and to take any reasonable risk. On examination, I found the uterus in proper

position, and rather under size; but as menstruation was perfectly normal, the size of the organ was not deemed of any great importance. The canal was straight, but the os was exceedingly small, and the cervix felt to the touch like a little round marble, and almost as hard.

Of course there was but one thing to be done, viz., to open the os and cervix by the bilateral operation. This lady, who had already suffered so much from dilatation, thought the operation a small affair compared to the result hoped for.

In this case, I was able to say beforehand that she would almost certainly conceive after the operation. Very often we can say to one, "Yes, you are almost sure to conceive;" while to another we are compelled to say, "Conception is probable;" to another, "It is possible;" and to others, "It is impossible."

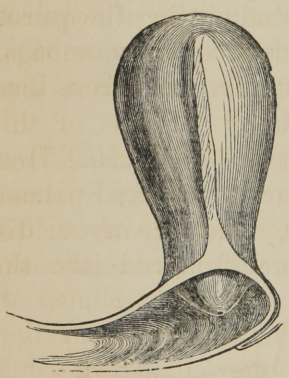

Fig. 65.

This diagram (fig. 65) represents the relative condition of the os and cervix. The operation was done in April, and conception occurred in December following. Here there was no dysmenorrhœa, as already remarked. And why? Simply because there was no mechanical obstruction to the flow. The canal of the cervix was small, but straight; and its mucous membrane was not congested. Had it been a little crooked, there would probably have been pain, for it was very small. But as small as the os was, it permitted the easy exit of the menstrual flow, while it prevented the ingress of the sperm. This is proved by

the fact that she was sterile for thirteen or fourteen years, during which time she tried all sorts of remedies to overcome it, and then became pregnant in a few months after the performance of the operation.

I have seen many other similar cases, and a great many like it artificially produced by the injudicious use of potassa fusa, potassa c. calce, and even nitrate of silver.

Sometimes the os tincæ becomes wholly occluded by the prolonged use of these agents; more frequently it is partially closed, and the cervix always feels indurated. Whether the induration is due to the action of the remedy, or to the inflammation that called for its application, I shall not pretend to say; but I have generally found artificial occlusion of the os to co-exist with induration of the cervix. This produces a state of acquired sterility. I have met with it more frequently amongst those who had once borne children, though I have seen it in those who had not. A marked example of this was found in the out-door practice of the Woman's Hospital, in a young unmarried woman who had had potassa c. calce applied some months before at one of our dispensaries. When the finger was introduced into the vagina, the cervix was found in proper position, but it was perfectly round and hard, and no os was to be felt. When the speculum was used, we found the os completely bridged over by a dense fibrous band of union, with a little opening at each extremity, which would not admit an ordinary-sized probe. Fig. 66 represents the appearance of the os in

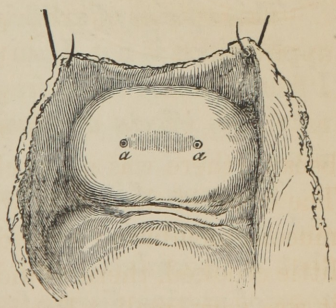

Fig. 66.

this case, and shows the two little points *a a*, whence issued the menstrual flow.

I saw, in consultation with Sir Joseph Olliffe in Paris, in 1863, a lady in the higher ranks of life, who had been twice married without offspring, and whose os tincæ had been thus artificially agglutinated by the prolonged use of the nitrate of silver during her first marriage.

When this mechanical obstruction to the egress of the menses is thus artificially produced, we may find more or less suffering and general malaise attending the flow, which becomes unusually prolonged, always very dark-coloured, often of tarry consistence, and sometimes offensive. The cessation of the flow is then followed by a dark-brownish fine coffee-grounds-like mucus, which continues for a few days, and frequently irritates the parts with which it comes in contact. The mechanical obstruction at the os preventing the easy outlet of the flow, causes a partial retention of the secretions, which thereby undergo some change, that reacts upon the tissues, and produces a sort of subacute endo-metritis. Of course the only remedy is the restoration of the os and cervix to a normal state, by cutting the canal open, and keeping it so.

This species of artificial occlusion of the os by caustic applications is not, I am glad to say, very common, but I fear it occurs more frequently than it should. Fortunately its effects are easily remedied if they are recognized.

The cases of it that have fallen under my observation did not present themselves on account of the sterility that it engendered, but because of the ordinary symptoms of uterine disease from which they suffered. Several of these, when cured of the organic difficulty, were rendered fruitful again.

I have repeatedly said that the subjects of sterility are naturally arranged in two great classes; viz., those who have never borne children, and those who, having once conceived, cease, from some cause or other, to conceive again.

Very perfect illustrations of this last class may be found in those who have had the os uteri artificially sealed up by the injudicious use of the potassa fusa or potassa c. calce. Amongst the cases of this sort that I have seen, I now call to mind two ladies, who had been treated by the same physician.

They are important enough in their bearings on this subdivision of our subject, to give a few particulars. A lady, aged thirty years, married at twenty-one, had two children, the youngest six years old. There was nothing peculiar about the labours, but she was subject to leucorrhœa after the last one, for which she had general constitutional treatment, and, after a while, local applications of the potassa c. calce, nit. arg., &c. Menses rather profuse but otherwise normal, till about two years ago, they became gradually very tedious and prolonged, lasting nine or ten days, instead of three or four, as they did previously to the potassa c. calce treatment. The flow was now scanty, very dark-coloured, almost black, attended with nausea, nervous irritability, and a sense of utter prostration, together with bearing-down, weight and soreness in the rectum, and neuralgic pains at the end of the coccyx. She also had great tenderness and sensitiveness at the mouth of the vagina. The fundus was considerably hypertrophied, the cervix was also hypertrophied and indurated, and felt more like a small globe pessary than anything else ; and it was utterly impossible to detect the os tincæ by the touch.

Fig. 67 shows about the size and relation of the little opening through which the menses made their tedious escape. The canal was opened by the bilateral incision. The whole cervix was of fibrous hardness, and the resistance to the knife was very great. As usual in these cases, there was but little hæmorrhage, but there was great trouble in keeping the os open. However, it remained sufficiently so. The next menstruation was normal, and in four months she conceived again, after an acquired sterility of six years, due, firstly, to granular

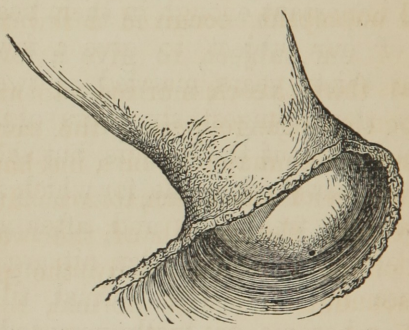

Fig. 67.

engorgement, and its attendant leucorrhœa, and lastly, to the potassa c. calce treatment and its result, occlusion of the os.

I do not object to the use of potassa c. calce judiciously applied, but it is well for us to know that it is all-powerful to do mischief, while we intend only to do good with it. I feel, therefore, justified in pressing this matter a little more on the attention of the reader.

Mrs. M., aged thirty-six, three children, youngest six years; some uterine trouble ever since the last labour; was treated for "ulceration" by potassa c. calce three years before I saw her in April, 1856. Her menses,

scanty, dark-coloured, of a tarry appearance, were now preceded by pain for a week.

It is a waste of time to give general or even local symptoms.

The uterus was anteverted, the fundus hypertrophied, the cervix almost as hard as cartilage, and the os was contracted to a little round point, that could not be detected by the touch.

The os was cut open; the next menstruation was painless and normal, and the enlargement of the fundus soon subsided as a consequence of the easy exit of the menses, and conception occurred a few months afterwards.

But I pass from this class of cases to another, where the os is open enough to permit the easy exit of the flow, but where there may still be a mechanical obstruction to the ingress of the spermatozoa. It is not sufficient to say that the mouth of the womb is large enough, and that it admits easily the passage of a bougie or a sound.

To illustrate my meaning I turn to my note-book. Mrs. ——, aged thirty-five, two children, youngest ten years old. She had been in bad health for a long time, and was treated by a very eminent physician, Dr. Duane, of Schenectady, who sent her to me in June, 1856. The uterus was anteverted, and greatly hypertrophied, being three inches and three quarters to the fundus; the cervix was the seat of fibrous engorgement; the menses were profuse, lasting five or six days, returning in seventeen; and she was anæmic and prostrated.

A course of treatment, local and constitutional, was agreed upon, and Dr. Duane sent his patient to me again in the autumn. She was somewhat improved; the depth of the uterus was three and a quarter inches

instead of three and three quarters; and the hypertrophy and induration of the cervix were better, but there was little or no improvement otherwise.

I was at a loss what more to do for her relief, and felt very sure that her ten years of sterility was due not so much to the state of her general health as to the peculiar conformation of the mouth of the womb, which certainly prevented the ingress of the spermatozoa. Many of us think that a pregnancy will often modify the nutritive functions of the uterus in such a way as to remove engorgements, hypertrophic conditions, and even small fibroids. With my mind full of this idea, I asked my patient, rather jocularly, if she would like to have more offspring. She promptly replied, "No." "Well," said I, "it's difficult for me to determine what else to do, if you will not consent for me to rectify the condition of the mouth of the womb, so that conception may take place." She did not think it possible, and hardly believed me to be in earnest.

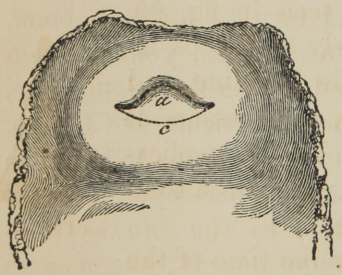

FIG. 68.

Now it may be asked what could be the trouble with the mouth of the womb, when she had had children, and when she still menstruated without the least difficulty. From the birth of the last child she had had leucorrhœa, as a consequence of granular engorgement of the cervix. Dr. Duane had cured this long ago, and there still remained, as previously stated, some hypertrophy of the cervix. This, too, he had removed, in a great measure, during the summer, by two small potassa c.

calce issues, one on each lip of the os tincæ. But there still remained the same mechanical obstruction at the os as before, which is represented by fig. 68. A crescentic-shaped os is by no means uncommon. We often see it in anteversions, and I have frequently seen it where the position of the uterus was normal. We may have it where there has never been conception, or it may occur after child-bearing, as a consequence of chronic inflammation of the cervix, with hypertrophy of the cervical mucous membrane. Here it presented no barrier whatever to an outward flow; but a glance at the peculiar projection *a* from the anterior lip, shows what a perfectly valvular closure it opposed to any inward flow. When this little tubercle *a* was hooked with a small tenaculum and pulled downwards, so as to open the canal of the cervix, and permit a view of its cavity, this hypertrophic condition was seen to extend up along the anterior face of the cervix for an inch. The curvilinear dotted line *c* shows the course of the incision by which this was removed. It was a triangular wedge, as seen in fig. 69, the apex having reached nearly to the os internum. There was but little bleeding, and this was controlled at once by the pressure of a sponge probang, and then by the application of a pledget of cotton, wet with a solution of the perchloride of iron.

Fig. 69.

The wound was healed by the time of the next menstruation; and my patient went home with the os presenting a perfectly normal appearance. Notwithstanding her feeble state of health, and the length of time since the birth of her last child, conception occurred a month after the operation. She went the full time, and was safely delivered by Dr. Duane of a fine

boy. But I am constrained to say that the pregnancy produced no good effect either constitutionally or locally. I had occasion to examine the uterus some four or five months after delivery, and its condition was about the same as at the time of conception. The case is valuable only as illustrating one of the mechanical obstacles to conception. It is not exceptional, for I have seen other similar cases.

Again, the mouth of the womb may be open enough to let the menses flow out freely, and it may be even large enough to admit easily a No. 8 or 10 bougie, and yet be absolutely closed to the ingress of the spermatozoa; and that without any excrescence or malformation. This condition is a very common cause of acquired sterility, and occurs in this way: Labour is followed by a chronic inflammation of the cervix, which becomes hypertrophied; the inflammation or granular erosion is cured, but the hypertrophic condition conjoined with induration remains, and the two indurated, thickened lips of the os tincæ lie in close apposition, yielding readily to any fluid passing down, but opposing any passing up the canal. We too often overlook this cause of sterility, common as it is. We are apt to say the mouth of the womb is all right, because it admits a large bougie, and gives free vent from the uterine cavity.

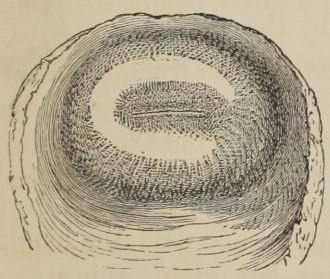

Fig. 70.

Now, what is to be done with such a case? The os is a straight transverse line, with the two opposite borders crowded obstinately against each other (fig. 70). It is long enough from side to side, but antero-posteri-

orly it has lost its gaping, graceful oval form, and although quite as large as it ought to be, it is still to all intents and purposes practically closed. Such an os as this may be bougied till both surgeon and patient are mutually tired out, without any result whatever; and there is but one thing to do, viz., to incise the cervix as for dysmenorrhœa. It may seem paradoxical to enlarge an os that is already large enough, but the only way in which I have ever succeeded in causing a permanent receding of such compressed lips, is by a bilateral division of the circular fibres of the indurated cervix.

In March, 1859, a lady, twenty-seven years old, consulted me on account of acquired sterility. She had had one child five years before,—no conception since. As she and her husband were both in vigorous health, she wished to know the cause of what was to them a source of great unhappiness. She had been told by her family physician that there was no reason why she should not conceive. On the contrary, I said that conception was utterly impossible, with the mouth of the womb as it was, and explained the necessity of a surgical operation. Being satisfied of its painlessness and its safety, she submitted to it at once. The cervix was hard and gristly, but the incisions produced the desired result of giving the os an elliptical shape.

It required nice care to prevent a contraction of the os to its former condition. Fortunately all went on well, and in less than twelve months from the date of the operation the mother was safely delivered of twins, which, she said, made up amply for her lost time.

In fifteen months after this she gave birth to another child, which proved that the mouth of the womb remained properly open.

I might go on to enumerate various other changes

that take place in the appearance and form of the os, as a result of accident, inflammation, engorgement, or hypertrophy, any and all of which may in some sort interfere with the passage of the spermatozoa to the cavity of the uterus. Many of these we will recognize and remedy, while great numbers, even when fully understood, will baffle our efforts.

We all know that a protracted labour with impacted head often produces sloughings of the vagina, which result in fistulous openings into the bladder or rectum; but sometimes we have the impaction in the superior strait before the head has passed through the cervix, and then we may have a sloughing of some part of the cervix without necessarily a fistulous communication with the bladder or rectum. Sometimes we see the anterior lip destroyed; again the lateral portion of the cervix; again the posterior lip; and a few years ago, Professor Isaac E. Taylor, of the Bellevue Hospital Medical College, showed me the entire cervix that had been thrown off by slough, in consequence of impaction. In almost all the cases, the cicatrizing process produces malformations of the os that mechanically prevent conception. I might give an immense number of illustrations of these unfortunate cases, drawn from the records of the Woman's Hospital, but one will suffice.

Fig. 71 represents the appearance of a case that was in the Woman's Hospital in 1856; the anterior lip of the os tincæ was entirely destroyed, but the posterior being intact, projected slightly forwards, so as to hide the small opening leading to the canal of the cervix. There was a minute vesico-vaginal fistula which was easily cured, but the mouth of the womb remained contracted, puckered, and over-lapped by the posterior lip in such a

way as to form a complete barrier to a subsequent conception.

Professor Fordyce Barker, of the Bellevue Hospital Medical College, sent me a case in 1858, in which the whole cervix had sloughed off without injury to the

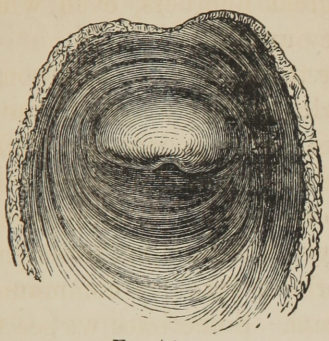

Fig. 71.

vagina; and the cicatrizing process had here produced a complete obliteration of the os. When the finger was passed into the vagina, we could feel the womb as if it were sitting on this canal, seemingly attached to it by a narrow neck, but not projecting into it at all. Here, not only the os but the canal of the cervix was obliterated. It was no easy matter to make an opening through this dense isthmus of fibrous tissue up to the cavity of the organ. But I fortunately succeeded, and kept the canal open with an intra-uterine stem for two months, and the patient left the Hospital; but she returned in two or three months afterwards, just as she was when I first saw her. The operation was repeated a second and even a third time, and the canal was eventually obliterated a second and a third time.

But other deformities of the os tincæ may occur of a less formidable character, still resulting in complete sterility. As so often said, any organic condition

whatever that tends to prevent the passage of the spermatozoa, necessarily prevents conception. Wishing to impress this point on the young surgeon, I shall continue clinical illustrations of my meaning.

A lady, aged twenty-six years, had had two labours at full term, the last six years ago. This labour was violent and very rapid, lasting only half an hour. The child was large, and the head was probably forced through the neck of the womb before it was sufficiently dilated, and the os was, consequently, lacerated from side to side. This healed slowly, but she remained sterile afterwards.

Fig. 72 represents the appearance of the os: the anterior half of the cervix was twice as thick as the posterior, while the posterior lip of the os over-lapped the anterior, closing it valvularly and perfectly. The cervix was indurated, and the cicatrices resulting from the laceration and subsequent healing could be distinctly seen extending laterally from the os to the insertion of the vagina. This lady was anxious for more offspring; and I proposed to cut off the posterior over-lapping lip of the os, as indicated by the dotted line *a*, which would straighten the canal and open the door to the entrance of the spermatozoa, that is, if the healing process could be managed so as to prevent undue contraction. However, she was frightened at the idea of an operation, and would have nothing done.

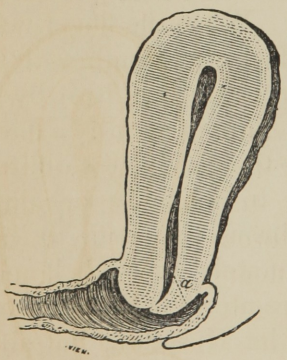

Fig. 72.

But it may be said, "Your views of conception are

entirely too mechanical." The act of copulation is purely mechanical. It is only necessary to get the semen into the proper place at the proper time. It makes no difference whether the copulative act be performed with great vigour and intense erethism, or whether it be done feebly, quickly, and unsatisfactorily; provided the semen be deposited at the mouth of the womb, everything else being as we would have it. Thus far I accept the charge of mechanical views.

To illustrate the principles of the operation above suggested, here is a case in point. A widower in the prime of life, in good health, the father of children, married a young wife, who at the end of five years remained sterile. The fault was not with the husband, as shown by his previous marriage. The wife's menstruation was regular, lasted two days, and not painful to any great degree, except when she was exposed to cold during the advent of the flow. She suffered slightly from constipation and hæmorrhoids, but her great trouble was leucorrhœa, with pruritus. An examination showed that there was no granular erosion of the os, and that the irritating secretion was a pure utorrhœa.

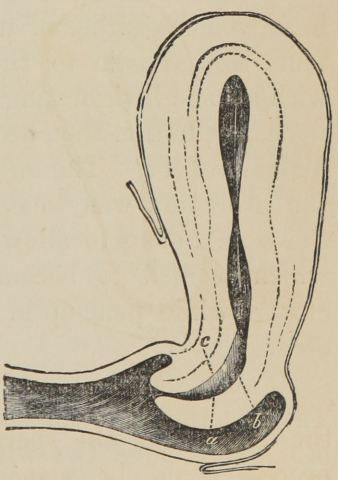

Fig. 73.

Fig. 73 represents the anatomical peculiarities of the os and cervix and the course of the canal. The position of the uterus was normal. The intra-vaginal portion of the cervix was irregularly developed, the anterior

segment being not more than one-fourth as long as the posterior. In other words, the os tincæ was found, as it were, on the anterior face of the cervix instead of being central, as at *a*, in a line with the long axis of the cervical canal. The os was very small, but by means of a sponge-tent it was ascertained that the anterior face of the cervix at *c* was the seat of a granular condition of the cervical membrane evidently giving rise to the morbid secretion that irritated the external parts.

This lady did not consult me on account of her sterility, but solely for the relief of her physical sufferings. Conception would be absolutely impossible in such a case as this. I have seen many like it, and they are of necessity always sterile. Such malformations are evidently congenital.

Three months of treatment here produced no sort of improvement, either of utorrhœa or pruritus. Sponge-tents and caustic to the granulations at *c* combined with a tonic invigorating course were wholly useless.

The question then arose, "What else can surgery do for her relief?" The only way that I could see to cure the utorrhœa, was to open permanently the mouth of the womb, so as to allow a free outlet to the secretions, which seemed to become acrid, by undergoing some change while pent up in the pouch formed in the canal of the cervix.

Two plans of operation were suggested to my mind. The first to divide the os and cervix bilaterally, and the other to remove the whole of the posterior lip to *b*. The first plan might relieve the utorrhœa on the principle that we adopt in curing a sinus by making a capacious outlet for its contents, whereby it is kept constantly drained; but I felt very sure it would never

relieve the sterility, because the redundant posterior flap would always naturally over-ride and over-lap the anterior portion, and prevent the upward passage of the spermatozoa; and because I had on several occasions tried it under like circumstances without success, and I feared that there would be no permanent cure if the sterile condition were not overcome.

I did not then know of the plan of splitting open the posterior lip backwards, as illustrated in fig. 63, page 169, or I would, in all probability, have adopted it at the time. I determined, however, on amputation, or exsection of the posterior portion of the cervix up to the dotted line *b*, as being the best method of both insuring a good outlet for the leucorrhœa and a good inlet for the semen. The operation was done in April, 1857, with the assistance of Dr. Emmet and Dr. Scudder, then house-surgeon at the Woman's Hospital. The patient left us in a fortnight, which was entirely too soon after such an operation, for we were thus deprived of using all means to prevent an undue contraction of the os by the granulating process. However the utorrhœa and the pruritus were eventually cured. A conception in due time, and a natural labour at full term, have proved, as far as one case can, the correctness of the principles of the operation adopted for the relief of this and analogous cases.

I might go on to enumerate various other modifications in the size, form, and relations of the os tincæ; but we have had enough of this to impress upon the mind of the young surgeon the importance of imitating nature as much as possible, if we expect to attain the object of our efforts.

SECTION IV.

THE CERVIX UTERI SHOULD BE OF PROPER SIZE, FORM, AND DENSITY.

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Of 250 married women who had never borne children, the condition of the cervix was particularly noticed in 218, the remaining 32 being excluded on account of other complications, that would mar or counterbalance any influence that the peculiarities of the cervix might exercise over the sterile condition. Of these 218—

The cervix was...	Flexed	in 19	71
	„ and conical	„ 31	
	„ „ and indurated	„ 21	
	Straight, conical, and indurated	in 4	147
	„ „ „ and elongated	„ 109	
	„ „ elongated, but not indurated	„ 7	
	„ not conical, but hypertrophied and indurated	„ 14	
	Granular	„ 10	
	„ and conical	„ 3	
			218

Now of this number we find—

71 flexed,	of which 52 had a conical cervix		
147 straight,	„ 123	„	„
218	175		

Thus we have a conoid cervix in nearly 85 per cent. of all cases of natural sterility.

This shows very plainly the great influence that this

peculiar abnormal form of the cervix exerts over the sterile condition; and when we remember the fact that it is almost always associated with a contracted os, we are constrained to acknowledge its importance.

Having said that the cervix should be of proper size, form, and density, let us consider its variations in size from a normal standard.

It is normally about half the length of the uterus, and projects into the vagina from a fourth to the third of an inch anteriorly, and a fraction more posteriorly. The intra-vaginal portion is rounded, truncated, and elastic to the touch; but it may vary from this in many particulars. It may be hypertrophied or elongated, or it may not project into the vagina at all. It may be flexed, indurated, engorged, or granular; but in the sterile, as shown in the table above, it is most frequently of conical form, whether straight or flexed; and with the indurated conoid form there is, as before said, almost invariably associated a contracted os.

But, independently of its mere form, if the cervix projects into the vagina a full half-inch, it is very likely to be associated with the sterile state; if an inch, the case is almost necessarily sterile; if it should be still more elongated, say one and a half or two inches, it becomes absolutely so; and if it does not project into the vagina at all, it is equally sterile.

Elongation of the cervix is very common, while its defective development is comparatively rare. This elongation is sometimes real and sometimes only apparent. It is real when the cavity of the uterus is more than two inches and a half deep, and the additional depth is seen to be due to the unnaturally developed cervix. It is only apparently too long when the depth of the cavity is normal and yet the cervix evidently

projects too far into the vagina, in consequence of the vagina being inserted too high on the cervix. But whether really or apparently too long, the same treatment is necessary. If the elongated cervix is more than an inch, the body of the uterus will almost of necessity be thrown backwards, because the neck projecting so far into the vagina, can only accommodate itself to the opposite wall, by taking the direction of its axis. This position of the cervix must be attended with a retroversion of the body, or if this be in a normal position, then, as a rule, the cervix must be flexed anteriorly. Sometimes it may result in complete procidentia, but we have only now to deal with the fact, and not its consequences.

Suppose we find the cervix too long, what are we to do with it? Some of our best authorities tell us to melt it down with the potassa c. calce or potassa fusa when it is greatly hypertrophied. I never tried to do this, but I have seen cases of hypertrophy after they were subjected to the process, and I have no hesitation in saying that it is not the safest, easiest, and best thing to be done. What is better then? Amputation; and for this there are two methods—the knife and the écraseur, the former of which I here greatly prefer. The objection to the écraseur is that it makes a lacerated surface to heal by granulation, which takes a long time, often leaving the os tincæ contracted. Another objection to it is the uncertainty of amputating just where we place the chain, which often draws in more tissue than we intend, and removes more than we wish. So great has been this trouble, that some of the German surgeons have given up the écraseur altogether in operations on the neck of the womb, because the attachment of the bladder and, in some instances, the posterior cul-de-sac of the vagina,

have been injured, and even the peritoneal cavity opened by its greedy grasp. It might be supposed that these accidents are hypothetical, but unfortunately I can testify personally to the truth of, at least, one of them.

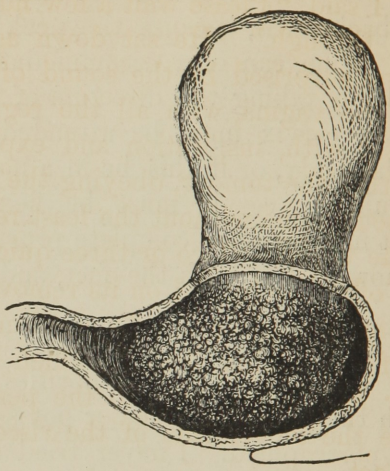

Fig. 74.

A lady from Connecticut was sent to the Woman's Hospital in October, 1860, with a cancroid tumour of the cervix, about the size of a Sicily orange. It grew from the whole cervix. Fig. 74 is intended to represent its relative size and position. There was no doubt as to the nature of the disease, nevertheless it was determined to remove it. The patient was etherized, and placed on the left side, as in all such operations. The speculum was introduced, and the chain of the écraseur was carried around the base of the tumour, just at the reduplication of the vaginal cul-de-sac antero-posteriorly, the parts remaining *in situ* as represented in the diagram.

The écraseur was worked in the usual way; the late Professor V. Mott was sitting on my right, watching the process. He had great objections to the instrument on

philosophic grounds, and I was anxious to prove to him that it should be accepted as a valuable addition to our surgical resources, which, however, I failed to do. He was on the eve of leaving before the operation was finished, when I said, "Please wait a few minutes, Doctor; it is almost through." He sat down again, and in a moment I was surprised by the sound of air rushing in and out of the vagina, with all the regularity of, and synchronously with, inspiration and expiration, at the same time that the tumour, obeying the slight traction on the écraseur, came without the least resistance to the mouth of the vagina. Two or three quick turns of the chain cut it off entirely, and on its removal I was horrified to find an immense hole of a semilunar form, in the cul-de-sac of the vagina, through which we could look for three or four inches up into the peritoneal cavity, and observe the movements of the viscera with every respiratory act.

Fig. 75 represents the appearances of the parts. The

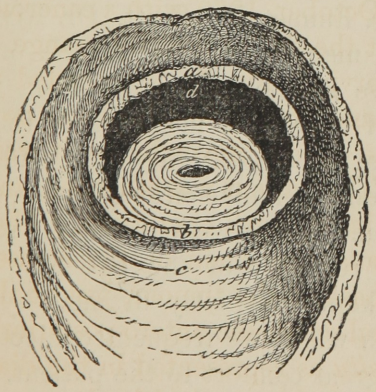

Fig. 75.

uterus adhered anteriorly at *b*, but posteriorly and laterally it was completely severed from all vaginal con-

nections. To have closed the parts properly, we should have united the edge of the posterior cul-de-sac *a* to the posterior portion of the uterus from which it was separated; but as we all looked upon the case as necessarily and immediately fatal, and as the nice adaptation of the parts would have been tedious, compelling us to keep our patient longer under the influence of ether than we wished, we concluded to make quick work of it. The edges of the vagina anteriorly, and all the way around, were rapidly denuded, and six silver sutures were passed, as in the operation for vesico-vaginal fistula, and the two opposite borders of the vagina were neatly approximated, leaving the neck of the uterus within the peritoneal cavity. But for the drainage of its secretions a catheter was passed into the peritoneal cavity at the central point of union opposite *c*, which was left slightly open for this purpose. A severe peritonitis followed, from which she fortunately recovered.

This operation was witnessed by a large concourse of medical gentlemen; amongst whom were the venerable Dr. Mott, Dr. Emmet, Dr. Pratt, Dr. Rives, then house-surgeon, and many others. It is the only instance in which I have seen any accident from the use of the écraseur. Of course the inclosure of the cervix within the peritoneal cavity was all wrong, and should not be done again under similar circumstances, and would not have been done then if we had had the remotest idea of the possible recovery of the patient. The peritoneal cavity was kept constantly drained, by means of the tube, through which we frequently injected tepid water, which gave great comfort to the patient.

It was worn for about three weeks, when the opening became fistulous and remained patent. Greatly to my surprise, the patient recovered entirely from the

effects of the operation, and in a few weeks returned home in a very comfortable condition; but soon symptoms of the old cancroid disease began to manifest themselves, and she died of cancer some eight or ten months after leaving the Hospital. The idea of drainage-tubes for the peritoneal cavity, and of injecting this cavity through them, belongs to my countryman Dr. Peaslee, who has fully established the safety and efficiency of the practice, after the operation of ovariotomy, where there are poisonous secretions to be evacuated. The reader will find Dr. Peaslee's cases reported in the *American Journal of the Medical Sciences*.*

Amputation of the cervix uteri belongs essentially to French surgery. It was a very frequent operation in the hands of Lisfranc. He amputated the cervix in ninety-seven cases, and lost but two patients.

Lately Huguier has brought it more prominently before the profession in generalizing it for all cases of what he terms hypertrophic elongation. His success is all that could be desired. Huguier's were all procidentia cases, mostly with elongation of the supra-vaginal portion of the cervix; but we are here to consider the operation as applicable only to infra-vaginal elongation, without necessarily a procidentia.

In my early amputations with the écraseur, the os tincæ was so often puckered and contracted, that I adopted the plan of doing the operation at two periods; thus, I would with scissors split the cervix bilaterally, nearly down to the insertion of the vagina, and then remove one-half of it; for instance, the anterior portion *a*, at *b* (fig. 76); wait one or two menstrual periods

* *American Journal of the Medical Sciences*, January, 1856, p. 49, April, 1863, p. 363; July, 1864, p. 47.

for the parts to heal, and then remove the remaining half.

This was getting to be the method pretty generally adopted at the Woman's Hospital till October, 1859,

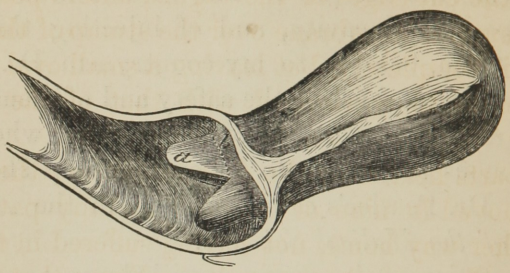

Fig. 76.

when we hit upon the following plan and in the following way. A lady from North Carolina was sent to me by her physician for amputation of the cervix. Her time being limited, she was very anxious to return home as soon as possible. I therefore determined to remove the whole cervix at one operation with the écraseur. Just as she was fully etherized, Dr. Pratt, the house-surgeon, reported that our only écraseur was broken; and without any choice in the matter, I was compelled to amputate with scissors. By hooking a tenaculum in the anterior lip of the os tincæ, the cervix was pulled gently forwards, and held firmly, while with scissors it was split bilaterally nearly to the insertion of the vagina, still holding on with the tenaculum; the anterior half was quickly cut off with scissors and then the posterior half. I intended to leave the stump to heal over in the usual way by the granulating process, which would have taken from three to five or six weeks, but, while examining the wound, and waiting for the bleeding to cease, the idea all at once occurred to me to cover over the cut

surface with vaginal mucous membrane, just as we cover over the stump of an amputated arm or leg by skin, after the circular method. I immediately passed four silver sutures, two on each side of the canal of the cervix, through the cut edges of the vagina, antero-posteriorly, which drew this membrane over the stump of the cervix, covering it completely, but leaving a small oval opening in the centre to correspond with that of the cervical canal.

The parts healed by the first intention; the sutures were removed in nine or ten days, and my patient was soon on her way home, not having suffered in the least from the effects of the operation. From that time on I have adopted this method of amputation, and have every reason to think that the healing by the first intention in this operation is relatively as superior to that by granulation as it is in any other amputation.

Fig. 77 represents the cervix after amputation, with

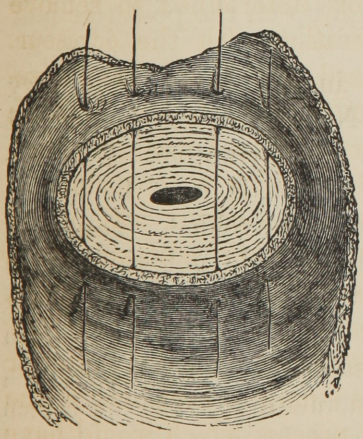

Fig. 77.

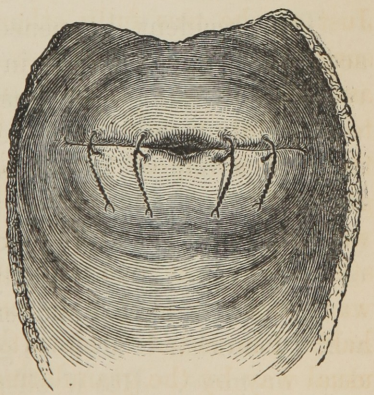

Fig. 78.

the wires passed through the cut edges of the vagina ready for covering over the stump.

Fig. 78 is to represent the appearance of the stump after the sutures are twisted and cut off.

But it may be asked what are the risks of the operation? I think they are few. Lisfranc lost two patients out of ninety-seven; Huguier operated thirteen times without any bad result. I have operated more than fifty times, thirty-six by this method, and lost one patient. This case occurred unfortunately just at a time when the hospital atmosphere suddenly became unfavourable to all surgical operations, and we had serious accidents to follow the slightest operation, before we were aware that we were breathing a poisoned air. If we had known of this epidemic condition, this patient would not have been operated upon at that time, for such was the state of our over-crowded wards that we were obliged to thin them out, and stop all operations for five or six weeks. But is there no danger in the operation *per se?* The only one that I know of is that of opening the peritoneal cavity by cutting too high up on the posterior half of the cervix.

This accident happened in the hands of a very accomplished accoucheur in New York, and his patient recovered without the least bad symptom. But, notwithstanding this fortunate escape, it must be looked upon as a danger to be carefully avoided. Take this method of amputation all in all, I do not think it is attended with any more risk than that of incision of the os and cervix. Theoretically it should be safer, inasmuch as the one is healed universally by the first intention, while the other is an open granulating surface for fifteen days or more. But if offspring be very desirable, and if a long cervix should seem to be the only or principal barrier, there are but few women who would not take

the slight risks of the operation for the fulfilment of a hope so precious.

I have not as yet had many cases of pregnancy to follow amputation of the cervix, but I am well satisfied now, that if amputation had been performed in many cases in which I simply cut the open cervix, conception might have occurred, where it has not.

On page 194 is recorded a case of pregnancy following the amputation, or rather exsection of the posterior portion of the cervix; and I have another case where it followed the removal of the anterior half of the cervix. The circumstances were these. Mrs. A., aged thirty; married seven years; one child six years ago; it died young; no conception since; very anxious for offspring; exceedingly unhappy. A minute detail of symptoms is unnecessary. She had retroversion, with hypertrophy of the posterior wall of the uterus; while the cervix was hypertrophied, elongated, and indurated. She was under treatment at times from October, 1857, to the spring of 1859. From the very beginning I told her I did not see how she could ever conceive with such a condition of the neck of the womb; and I wished then to amputate it, but she was afraid of the operation, and could not make up her mind to it. At last I told her that I could not expend any more time on her case, unless she submitted to amputation of the cervix. She consented, and entered the Woman's Hospital. I was then in the habit of performing the operation at two periods.

Dr. Francis, Dr. Mott, and Dr. Green, of the consulting board, and Dr. Emmet, were present at the operation on the 8th July, 1859. The cervix was split bilaterally with scissors, and the anterior half was removed. She left the hospital in a fortnight, with the expectation of

returning on the 1st of October for the removal of the other half. But fortunately the next menstruation was followed by conception. She went the full term, and was safely delivered.

In 1862 the greatest number of my amputations were performed. It was then a question with many of my medical friends whether the operation would not in itself prove a barrier to conception. The case of half-amputation above related, and the one on page 194, were then my only facts bearing on the question. But now I have two cases proving that it in no way interferes with conception. It is true that in these the operation was not performed with any view to conception, but simply for the removal of disease that baffled all other treatment. One was a patient of Professor Metcalfe, of New York. She was the mother of one child, and had been in bad health ever since its birth.

The position of the uterus was normal, the cervix was hypertrophied, but not indurated, the os was lacerated back through the posterior lip, nearly to the insertion of the vagina, and the cervical mucous membrane projected in voluminous granular folds, giving rise to constant leucorrhœa. Various remedies had been used without any improvement; and as Doctor Metcalfe had already exhausted our routine of local treatment, I proposed amputation as the speediest and surest method of getting rid of the diseased condition, and the operation was done in May, 1862, Dr. Metcalfe, Dr. T. G. Thomas, and Dr. Emmet assisting. The operation was performed as already described, and the stump covered over with vaginal mucous membrane by passing the sutures antero-posteriorly. Hæmorrhage came on two or three days afterwards, which gave Dr. Metcalfe and Dr. Thomas a little trouble; but she soon got well without any other

accident; and Dr. Emmet writes me that conception occurred four months after the operation.

The other case was that of a lady who had borne one child four years before. She is the daughter of an eminent physician. She had retroversion with enlargement of the posterior wall, and hypertrophic elongation of the cervix. This condition of the cervix seemed to be a barrier to a rectification of the malposition, and it was determined to amputate it. With the assistance of Dr. Emmet and Dr. Pratt, the operation was performed in June, 1862, and she conceived in October following.

These facts I present as an answer to any question in regard to the influence of amputation upon conception, and to show that the operation *per se* does not interfere with it. I have been minute and a little tedious in detail, because I shall soon have occasion to insist on the performance of this operation in a class of cases where, as yet, it has not been recommended.

An opposite condition of the cervix, viz., defective development, may be a cause of sterility, and I may mention it in this relation. We occasionally find the womb undeveloped or in quite a rudimentary state, and here menstruation may be wholly absent, or so slight as scarcely to attract attention. In such cases little or nothing is to be done. But now and then we find the womb large enough, and menstruation abundant, but the cervix does not project into the vagina. These are always sterile and usually dysmenorrhœal. The canal of the cervix will be very small and usually flexed.

As a type, I may give an illustration. Dr. W. E. Johnston called on me in December, 1863, with a patient of his, who had been married ten years without issue. She had consulted Velpeau, Nélaton, Ricord,

Trousseau, and thirty-two other physicians of Paris. Her dysmenorrhœa was fearful. She usually took anodynes, and had leeches applied by the speculum at each menstrual period. The symptoms and sufferings of such cases are too well known to require detail here. The finger passed into the vagina, found only a blind pouch, but it was sufficiently capacious. No cervix projected into it, but the uterus could be felt on the right of the mesial line, sitting, as it were, on the vagina, and attached to it by a narrow crooked isthmus of fibrous tissue, which was the undeveloped cervix, along which a probe could be passed to the fundus, a depth of two inches and a half. On the left of the uterus was a mass of condensed cellular tissue half the size of an English walnut, probably the remains of a pelvic abscess that occurred some four or five years ago. The circle *a b* (fig. 79) represents the place that should have been occupied by the cervix, while the point *c* shows the actual opening leading to the uterus.

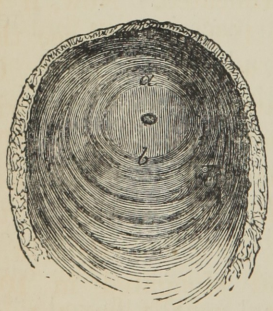

Fig. 79.

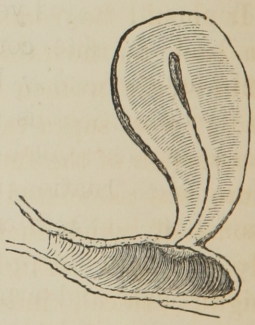

Fig. 80.

This point was once more obscure than at present, and some one of her physicians had split up a bit of vaginal membrane that overlapped, and made the canal more

valvular and tortuous than it is now; still this produced no improvement in her sufferings.

Fig. 80 shows the neck of the womb resting on the vagina instead of projecting into it. Of course there would be but one course here to pursue, viz., to cut open the canal of the cervix, and keep it open afterwards. But the operation would require great nicety, on account of the narrow undeveloped state of the cervix just where it comes in contact with the vagina. However, nothing was attempted in this case; she was an only child, and her father was afraid to let her submit to a surgical operation.

But let us leave these extreme cases, whether of hypertrophic or defective development, and pass to the consideration of such conditions of the cervix as we meet commonly and daily in sterile women.

At the beginning of this section I said, "the cervix should be of proper size, form, and density." Having now spoken of the size and its variations, we may ask ourselves what is a proper form or shape.

It should be rounded and truncated. Now, if we turn back to the table on page 199, we will see that of 218 sterile women the cervix was flexed in 71. Of these, 19 were supra-vaginal curvatures complicated with some version of the fundus from a normal position. The flexure was associated with a conoid form in 52 cases, in some of which there were also malpositions of the body. It was straight, conical, and indurated in 4; straight, conical, indurated, and elongated in 109; straight, conical, elongated, and not indurated in 7; granular and conical in 3.

It is thus shown that a conoid form of the cervix, whether flexed, straight, elongated, or not, is found in the great majority of cases naturally sterile, being here

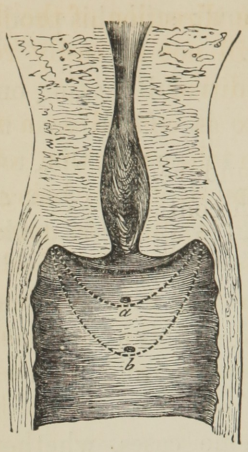

Fig. 81.

175 out of 218. We must discriminate between natural and acquired, or accidental sterility; and here let it be remembered that we speak only of those married women who have never conceived.

I know not how I can better describe what I mean by a conical cervix than by diagrams. Let fig. 81 represent a normal type of a rounded, truncated cervix. Now, if we imagine the cervix extended in the direction of the dotted line *a*, we shall have a not unfrequent form of conoid cervix, which will almost universally be associated with a contracted os, and be almost as constantly indurated. A moderate degree of conoidity like this may be remedied very easily, and if everything else is right, we may calculate with a good deal of certainty on the removal of the sterility. For this purpose the operation of incising the os and cervix as for dysmenorrhœa will suffice. The operation does not alone enlarge the os, but if the circular fibres of the cervix be properly and thoroughly divided, the lips of the os tincæ, instead of being puckered to a little round point, evert and roll back from each other, giving the cervix more of the natural feel of a truncated cone than of a pointed one, as before; and thus while it becomes truncated it also becomes shorter, or, in other words, while it assumes a more natural form, it also takes on a more natural size. This is the mildest and most favourable of the conoid form. Its type is represented in fig. 65, p. 180. But

if the cervix be extended in the direction of the dotted line *b*, then its mere incision will not so easily restore it to anything like a normal condition.

We sometimes find the cervix as conical as a mole's head, gradually tapering from the insertion of the vagina almost to a point at the os tincæ, being very much longer than it is broad. Calling to mind the fact that in 218 cases it was straight, conical, and elongated in 116, or more than half, I now think that the great mistake I have made in the treatment of these cases, was that of simply incising the os and cervix; and the same mistake has been made by all other surgeons.

I now propose to amputate a portion of the cervix in all such cases, for the purpose of giving it as near a normal form as possible. For instance, in fig. 82, let the cervix be amputated at the point designated by the dotted line.

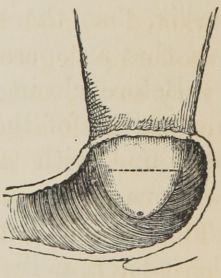

Fig. 82.

We have all been afraid to truncate the cervix in this way (if any of us ever thought of it before), and were satisfied with simply splitting it up for the relief of the pain of menstruation, thinking that if we were successful in this we might hope for success in other things. I have cut open the neck of the womb, and often seen conception follow soon after; and I have cut open scores, nay, hundreds of others, sometimes with relief to suffering; but how often have I been disappointed in the great object of the operation! And why? I now see that, in many cases, more must be done than to open the canal of the cervix.

When I run my eye over the list of cases in which

the operation has been quickly followed by conception, I discover that while almost all had a contracted os, all had also a cervix of no unusual length; and when I examine closely all those who have had a division of the os and cervix without its being followed by conception, I find almost every one of them either with an elongated conical cervix, or with some other complication equally if not more unfavourable. Does not the inference follow from this, that if we expect to treat such cases with more certainty and greater success, we must, other things being equal, approximate a normal condition as much as possible, by truncating the cervix to a proper size and form?

It was but the other day I had the opportunity of examining the cervix of an unmarried lady upon whom I had performed amputation two years ago; and so perfectly normal was the appearance of the os and cervix, that there were no evidences whatever of the fact that an operation had ever been done.

Before closing this subject, I may give a few more illustrations of the conical cervix. For instance, it may be found with a flexure, the anterior and posterior portions being unequally developed, as in fig. 83; and here we may cut open the cervix bilaterally, or split the posterior lip directly backwards; but I think it would be much better to amputate in the direction of the dotted line, and afterwards to cut open the cervix bilaterally, if the prime object of all treatment be offspring.

Again, we may have the conical cervix with a straight canal; the whole organ having the feel of a hard inverted cone (fig. 84).

These cases I have always cut open bilaterally, but I can call to mind few that were followed by conception.

In all such cases I am now very sure that it would be better to amputate, and restore the cervix at once to a normal condition.

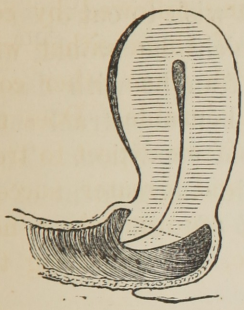

Fig. 83.

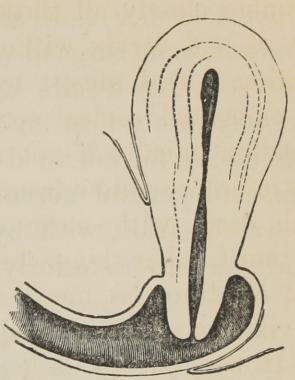

Fig. 84.

It is not at all uncommon to find a concoid cervix accompanied with retroversion. Sometimes the malposition seems to be the result of the elongated conoid cervix pressing against the posterior wall of the vagina. Conception is impossible in a womb of this relative size, form, and position (fig. 85).

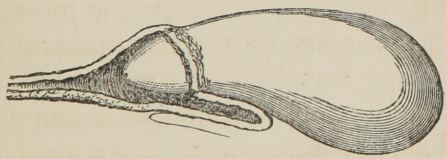

Fig. 85.

These examples of conoidity are enough to impress upon our minds its general character and appearance; but there are cases that cannot be called conoid, and yet are to be treated in the same way if we expect offspring. For example, I saw, in consultation in Paris, in May, 1863, a lady, about 27 years old, who had been

married six or seven years without offspring. She had had dysmenorrhœa ever since her marriage, and had been treated by very distinguished physicians, one of whom told her that she might possibly fall into the hands of some surgeon who might wish to cut open the neck of the womb, against which he would most seriously protest, as an operation fraught with danger. It is useless for me to dwell upon her menstrual sufferings, and general nervous, irritable condition. There was anteversion, with hypertrophic enlargement of the fundus antero-posteriorly, as at *a*, *b* (fig. 86).

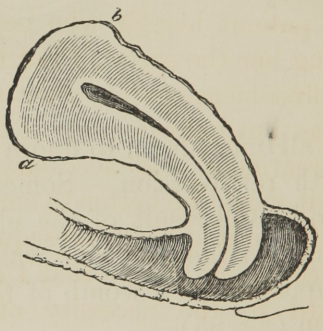

Fig. 86.

The cervix was curved, as shown in the diagram. The posterior lip overlapped the anterior, giving the os a crescentic shape. The anterior lip was granular. The cervix was not, properly speaking, conoid; but it was elongated, too long for easy conception, even if it had been straight and patulous. The canal of the cervix could not be called contracted, and yet the flexure was such as to bring the antero-posterior surfaces in close apposition, like laying the bowl of one spoon in another, which always presents a very complete obstruction to the egress of the menstrual flow. As a consequence of this mechanical barrier, she had a persistent endometritis, as

seen by the dark brownish mucus that was always found hanging from the cervical canal.

I here proposed to divide the cervix bilaterally, at the same time saying that amputation would give us a better chance for permanent relief.

Her medical attendant agreed to the operation of incising the os and cervix. Our object was to relieve the dysmenorrhœa and endometritis by opening the canal, knowing full well that it would be a most difficult thing to render it permanent unless we could keep the posterior lip everted or rolled backwards. However, the operation was thus performed, much against the wishes of the patient herself, who begged for amputation, as affording her the surest, if not the safest, method of cure. Her first menstruation after the operation was entirely painless, but unfortunately it did not remain so, and further treatment was necessary. In cases like this I am sure it would be better to amputate the cervix first, and then incise it at some subsequent period.

If experience should prove that I am correct in my views in regard to the necessity of amputating an elongated conoid cervix, for the purpose of augmenting the chances of conception, I feel that it is important to simplify the operation as much as possible. The amputation of the cervix by scissors, as I have always done it, is easy enough in the hands of a practised surgeon, but every one will not find it always so easy to make a good even stump by this method. I have not been able to get a pair of scissors curved sufficiently to do the work neatly. But I think I have at last hit upon something better, which I would term the uterine guillotine. This instrument is made in London by Mayer, and in Paris by Charrière. The idea of the uterine guillotine occurred to me in this way. In July last (1865) my

friend Dr. Henry Bennet invited me to amputate an elongated hypertrophied cervix in a patient of his who had had procidentia for a long time. The cervix projected from the vulva about an inch and a half. It was necessary to remove three-fourths of an inch of it. Dr.

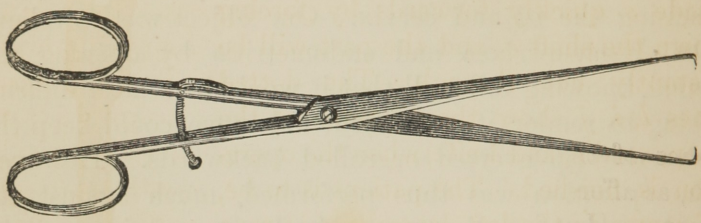

Fig. 87.

Bennet held the uterus firmly with a double tenaculum forceps (fig. 87), seizing the cervix antero-posteriorly, just above the point of election for the amputation. I then caught hold of the end of the cervix, and with a bistourie cut it instantly off. The stump was covered over with mucous membrane in the usual way with silver sutures. The operation was done so quickly and withal so neatly, that I immediately said, "Why should we not have an instrument, like those for the tonsils, to amputate the cervix all at once, while the organ is *in situ?*" This idea I gave to Mr. Mayer, and fig. 88 represents the instrument. It consists simply in adding a blade to the écraseur. At first I had a wire to constrict the part to be amputated, but I found that it would bend a little from a right line when tightened, and so strike the edge of the knife as it was pushed forwards; then, at M. Charrière's suggestion, a loop of narrow watch spring doubled three or four times was substituted, giving a flat surface along which the blade glides without obstruction.

In applying the instrument, let the loop *f* encircle the cervix where we wish to cut it off; turn the screw-nut *b* till the loop embraces the part firmly and immovably; transfix the cervix with the needle by means of the slide *d*; then push the blade *e* quickly forwards by forcing down the shaft *a*, and the part will be instantly cut through. The dotted lines *l*, *i*, *j* show the relations of the loop, needle, and knife, when the operation is finished. The patient is to be, of course, in the left lateral semi-prone position, and the operation executed without traction on the uterus. The stump is to be covered over with mucous membrane, as previously described and figured (p. 207). There is always some contraction of the os externum after all amputations of the cervix. It is better as a rule to let things take their course, and in two or three months afterwards cut open the os and cervix, and treat it just as we would under ordinary circumstances requiring such an operation. If we attempt to keep the os normally open, there is danger of interfering with the covering of the stump; and if we resort to the operation of incising it too soon after the amputation, say just after the next menstrual flow, we may in our manipulations tear the vaginal covering of the stump from the surface to which it has

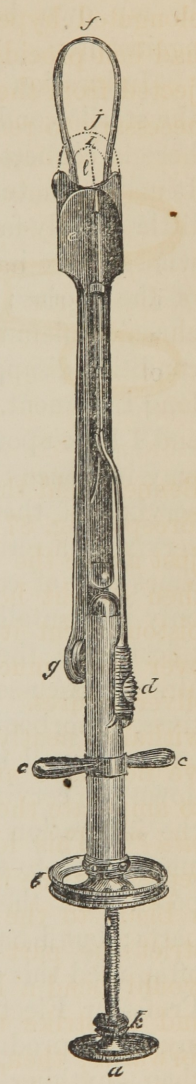

Fig. 88.

recently adhered. I have had this accident happen in my own hands; and hence the warning to guard against it.

Induration of the cervix is so often an attendant of the sterile condition that it is appropriate to speak of it here in connection with the size and form of the cervix. It may be natural or acquired; natural when we find a little gristly-feeling cervix in a dysmenorrhœal case, where there is often a small fibroid in the anterior wall of the uterus; acquired, when we find it following a chronic inflammation of the cervix, in which the granular condition disappears after a very long time and perhaps a long treatment. I have no specific treatment to suggest, and I look upon it as important, more particularly as it may influence the size, form, and relations of the os and cervix. If there is a deposit of fibrous tissue in the cervix, as a result of inflammatory action, I know of no short way of causing its absorption, and I deal with it only incidentally, as my attention is directed to the rectification of the anatomical and mechanical peculiarities already discussed. I know that physicians give alteratives, absorbents, and general constitutional remedies, and apply all sorts of things locally; that they melt down the cervix with potassa cum calce; but even then the induration remains; and I would prefer immediate amputation to this tedious uncertain process. It is supposed that the drain of the caustic issue softens the parts; but I have not seen it so, and some years ago I often used this potent agent. I must say, however, that Professor Fleetwood Churchill's iodine treatment has in my hands produced a greater amelioration in these cases than anything else; but it is tedious. Dr. Churchill tells me that I have failed with it because I have not persevered long enough in its use. I beg leave here to

refer the reader to his learned and classic work on the Diseases of Women for minute information on this point.

Dr. Barnes has recently (June 7th, 1865) presented a paper to the London Obstetrical Society, in which he discusses very ably the influence exercised by the conoid cervix upon the sterile condition. The following summary* is extracted from the report of the Secretary, Dr. Meadows:—"Dr. Barnes described and figured the form of cervix uteri which projected into the vagina as a conical body, the vagina appearing to be reflected off at a point nearer the os internum than normal. The os externum was unusually minute, scarcely admitting the uterine sound. This (the os externum) was the real seat of constriction. The os internum was normally a narrow opening, and in these cases of dysmenorrhœa and sterility it was commonly found to be of normal character. It was therefore unnecessary to divide it. It was, moreover, dangerous to divide it, on account of the close proximity of the large vessels and plexuses running into the uterus on a level with it. . . . . Discussing the question of treatment, Dr. Barnes showed that dilatation was unsatisfactory; that incision of the os internum as practised by Dr. Simpson's single bistourie caché, and by Dr. Greenhalgh's double bistourie caché, was unsafe and superfluous. He objected to the latter instrument, especially that it must cut as it was set, that it was too much of an automatic machine, not leaving scope for the judgment of the operator. His (Dr. Barnes's) own instrument, constructed like a pair of

* *Lancet*, July 15th, 1865: "On the Dysmenorrhœa, Metrorrhagia, Ovaritis, and Sterility associated with a Peculiar Form of the Cervix Uteri, and the Treatment by Division." By Robert Barnes, M.D.

scissors, acted on the same principle as Dr. Sims's ; it divided only the os externum, so as to open the cavity of the cervix, the part to be cut being first seized between the two blades. The operation was perfectly free from risk ; the hæmorrhage was usually slight, and a good os was made. He had performed the operation many times, both in hospital and private practice, and was well satisfied with the results. One advantage of incision over dilatation was, that it relieved the engorgement and inflammation."

Dr. Barnes's admirable paper gave rise to a lengthened discussion ; he and Mr. Baker Brown alone, amongst all the speakers, holding the same views that I do in regard to the relative infrequency of contraction at the os internum as compared with that at the os externum.

SECTION V.

THE UTERUS SHOULD BE IN A NORMAL POSITION—*i. e.*, NEITHER ANTEVERTED NOR RETROVERTED TO ANY GREAT DEGREE.

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Before treating of displacements of the uterus, let us first fix in our minds a correct idea of its normal position and relations. Not wishing to write one unnecessary page, I shall, as hitherto, avoid minute anatomical and histological detail, which can be better learned from any of our text-books. I would say, however, that some of the discrepancies of authors may be reconciled when we remember that one speaks of the condition of things in the living subject, and another in the dead. Thus, one will tell us that the uterus is about two and a half inches deep, while another will say it is less. Both are right; for the uterus, an erectile organ, full of blood, is larger and longer in the living body than in the dead. The knowledge of one is gained in the clinic; of the other in the dissecting-room.

I do not know of any anatomical plates that represent correctly the position and relations of the pelvic organs. The artist has not succeeded perfectly in this cut (fig. 89), but it is near enough to give us a good general idea of the subject.

[I was at great pains to get a correct outline of a vertical section of the pelvic bones as here shown. For this I am under special obligations to M. Péan, of Paris, Prosecteur des Hôpitaux, who politely afforded me every facility at Clamart, both in its museums and dead-house;

also to my talented young friend Edward Souchon, of New Orleans, Louisiana, who made for me repeated dissections, which were photographed, and from which Mr. Vien made the drawing.]

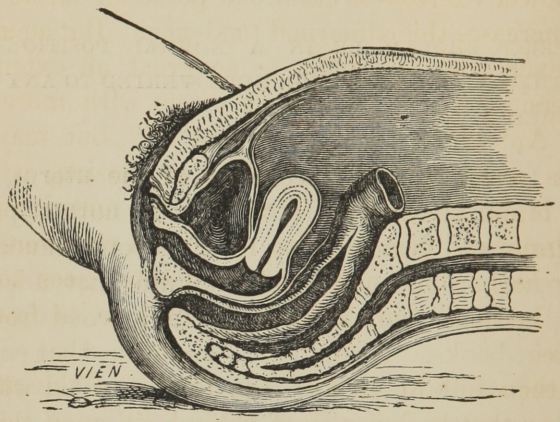

Fig. 89.

The uterus occupies, normally, very nearly a central position in the pelvis, being, perhaps, a little nearer to the sacrum than to the pubes. Its long axis should stand at about right angles to that of the vagina; the fundus pointing in the direction of the umbilicus, and the os tincæ towards the end of the coccyx. The fundus may be tilted a little one way or the other without the position being necessarily abnormal. The condition and contents of the bladder and rectum may temporarily influence it to some extent. If it turn forwards or backwards for 25° or 30°, it does not amount to a malposition; but if to 40° in either direction without soon rectifying itself, it is abnormal, and usually goes from bad to worse, till the malposition becomes persistent. A glance at the cut will show us that if the uterus fall backwards in a line drawn from the os to the promontory of the

sacrum, it will describe an angle of 45°, and will present its broadest surface to the pressure of the superincumbent viscera, which will necessarily force it eventually lower and lower; and if it turn forward to the same extent, the same power exerted on its broad posterior surface necessarily increases this abnormal tendency. But an anteversion never goes relatively to so great an extent as a retroversion, simply because it meets with more resistance. Anteversion often stops at 45°, but may go to 90°, as when we have a complete version, with the whole organ lying flatly down on the anterior wall of the vagina, and parallel with it, while a retroversion seldom or never stops under 90°, and often goes to 135°, simply because there is less opposition to its downward progress.

It then follows that if the fundus of the uterus is found constantly lying just behind, or even near, the symphysis pubis, it is an anteversion; but if it is found lying persistently back under the promontory of the sacrum, it is a retroversion. But when only the body of the uterus is turned forwards or backwards, the os seeming to be in rather a normal relation with the vagina, there is necessarily a bending of the cervix somewhere between the os externum and the os internum, and we call this a flexion. Most, but not all, versions become flexions; so that, as a general rule, they are but different stages or degrees of the same thing. I have not, therefore, thought it of practical importance to say that out of so many anteversions and retroversions, there was such a proportion of flexions, simply because these distinctions will not modify the general principles of treatment.

Time was, and not very long ago, when the diagnosis of uterine displacements was attended with great diffi-

culty, but there is nothing easier now. Formerly, all uterine disease was known under the sweeping term of prolapsus; a term that has been used so vaguely and indefinitely that it should be banished from uterine technology; for in England it is applied to a descent of the organ through the vulvar outlet, while in my own country it is often applied to its various intrapelvic deviations. Formerly, if any woman here had a little vesical tenesmus with a constant sense of weight in the pelvis, and bearing down, it was called a prolapsus; but now we know very well that these symptoms may exist as a sign of engorgement, or granular erosion of the os, without the least displacement of the organ.

To be accurate, then, the malposition should be ascertained exactly, and we should apply to it the term that would express precisely the deviation from a normal position. If we use the term retroversion, of course we all understand it, because its meaning is defined. If we say anteversion, for the same reason, there can certainly be no misunderstanding. If we say antero-lateral version, it is equally significant of the position, provided we add the qualifying adjectives, right or left, as the case may be. If we say procidentia, we mean that the cervix uteri has passed beyond the mouth of the vagina, to a greater or less degree; but to say there is prolapsus is to hide up the real condition of the uterus under a vague generality. I therefore use the terms anteversion and retroversion to designate the relative deviations of the body of the uterus from a normal position while within the pelvic cavity, and the term procidentia to designate its passage out of the pelvis through the mouth of the vagina.

Anteversions are often due to adventitious development of some sort in the anterior wall; retroversions

frequently occur as a sequence of debility, or relaxation in the ligaments that support the uterus. In both we often find an enlargement of that portion of the body which is most dependent. In the first, this enlargement frequently induces the deviation; in the second, it is oftener the consequence of it.

When we remember that about every eighth marriage is sterile, we see the necessity of investigating all particulars that can by any possibility bear upon the elucidation of this important subject. At the beginning (page 2) I said that I had, for obvious reasons, divided my sterile patients into two classes; viz., natural, and acquired sterility. The following table shows at a glance what an influence mere displacements of the uterus must exercise over the sterile condition in each of these classes:—

	No. of Cases.	Anteversions.	Retroversions.	Total Malpositions.
1st Class	250	103	68	171
2nd Class	255	61	111	172
Total	505	164	179	343

Thus we see in 250 married women, who had never borne children, that 103 had anteversion, and 68 retroversion; while in 255 who had once borne children, but for some reason ceased to conceive before the natural termination of the child-bearing period, 61 had anteversion, and 111 retroversion, the sum total in each class bearing almost exactly the same relation to the number observed, being about two-thirds of the whole. Hence we infer that if the malposition exercises an influence to prevent conception in the one class, it is of equal importance in preventing it in the other. The mere position of the uterus is here stated without

reference to causes or complications. I have purposely avoided saying how many of these had granulations, engorgements, hypertrophies, fibroids, ovarian cysts, or other complications. The table shows that two-thirds of all sterile women labour under some form of uterine displacement, without reference to the particular cause of such displacement; and that the anteversions and retroversions in the two classes are in inverse proportion: the anteversions in the first being about equal to the retroversions in the second; and the retroversions of the first nearly the same as the anteversions of the second.

Without further general remarks, let us proceed to consider in turn these various forms of displacement. I have not thought it worth while to make a distinct heading for antero-lateral flexions. They comprise but a small class, and are almost always secondary, being the result of some other affection.

Of Anteversion.—According to the tabulated statement above, nearly one-third of all sterile women have anteversion. In natural sterility the proportion is 1 in 2·42; in acquired, it is 1 in 4·18, being nearly twice as frequent in the first as in the second.

It would here be appropriate to lay down the rules of diagnosis in reference to this particular form of displacement; but as its principles have been already amply stated, whether by bi-manual palpation or probing (see pages 7, 8, and 101 to 105), it is unnecessary to repeat them here. I will now only say that we are never under any circumstances to probe the uterine cavity till we have by the touch first ascertained its probable direction; and then the sound is to be curved or not, according to the suspected curvature of the canal of the cervix.

Anteversion may depend upon a variety of causes; sometimes the uterus seems to be bent upon its own axis, in consequence of an abnormal elongation of the organ. For instance, suppose the sound passes three inches and a half into the cavity of the uterus, we would then say it is at least an inch too long. This must depend upon one of three things: either an elongation of the intra-vaginal portion of the cervix; elongation of the supra-vaginal portion; or hypertrophy of the fundus. If on the first, the touch, sight, and absolute measurement will at once determine it; if on the second, the unerring bi-manual palpation will demonstrate to our sense of touch, a long, delicate, slender, flexible supra-vaginal cervix; if on the third, it can be equally as well measured and judged by the touch alone, provided we apply the principles of diagnosis already referred to.

We sometimes find the uterus undeveloped, entirely too small, often not more than an inch and a half deep; and again, it is not uncommon to find it over-developed, with the supra-vaginal portion of the cervix long and slender; and when this is the case, the fundus must of necessity fall one way or another, and most usually forwards, producing anteversion or flexion.

Again, anteversion seems to be occasionally the result of a shortening of the utero-sacral ligaments; or else these ligaments become shortened by the long-continued malposition. Nothing is more common in old retroversions than to see the anterior wall of the vagina contracted in consequence of the long-continued malposition; and here it often presents a formidable barrier to a permanent rectification of the displacement. Now in the same way it is presumable that the utero-sacral ligaments, if not congenitally too short, may become

shortened by long disuse, just as the round ligaments may become relaxed and lengthened by long error of position.

Be this as it may, we sometimes meet with anteversions where we encounter great difficulty, and inflict great pain in drawing the os tincæ forwards. In these cases the vagina is long and narrow, and the os tincæ, instead of pointing towards the end of the coccyx, may look directly back towards the hollow of the sacrum.

Now, if we here insert a tenaculum into the anterior lip of the os tincæ, and pull it towards the urethra, feeling at the same time unusual resistance to this traction, there will be one of two things to account for it: either the fundus of the uterus is bound down anteriorly by adhesions, or the cervix is held back posteriorly by shortened utero-sacral ligaments. If the first, which is very rare, then it will be impossible to elevate the fundus to a normal position by the usual method of elevating the anterior cul-de-sac of the vagina up behind the inner face of the pubes with the left index finger, while the fundus is pushed backwards by the other hand acting upon it in the hypogastrium through the parietes of the abdomen; but if it be due to the second, then, by introducing the index finger into the rectum, or even to the posterior cul-de-sac of the vagina, at the same time that we draw down the cervix with the tenaculum, we shall feel the utero-sacral ligaments as tense and resistent as two well-stretched guitar-strings. I must admit that such cases are not very common; but their infrequency makes it the more important to be able to recognize them when we meet with them.

One of the most common causes of anteversion is a small fibroid in the anterior wall, as represented in fig. 90. It is very interesting to observe the influence of

such tumours in producing the various displacements of the uterus. If a fibroid not larger than an English walnut is attached in any way to the posterior wall of the uterus above the level of the os internum, it almost invariably pulls the uterus over backwards, producing retroversion; but if a similar-sized tumour is attached to the posterior wall of the uterus below the level of the os internum, whether it be pedunculated or not, it will almost as invariably push the fundus of the uterus over forwards, or produce anteversion. In other words, a small tumour of the body of the uterus posteriorly will produce retroversion, while the same sized tumour of the cervix posteriorly will produce anteversion; and *vice versâ*, a small tumour in the anterior wall of the body anteverts the uterus, but if it grow anteriorly below the

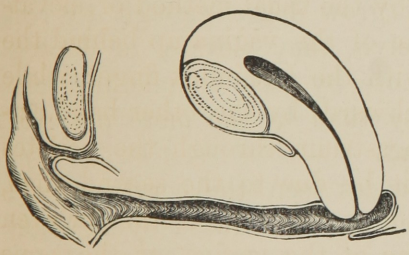

Fig. 90.

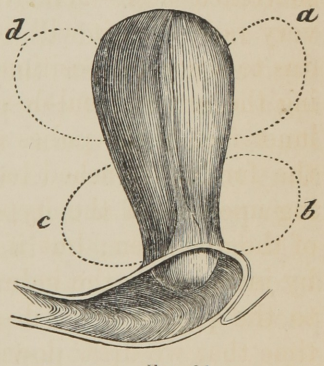

Fig. 91.

level of the os internum, it invariably retroverts it. The reasons are anatomical and most obvious. Let fig. 91 represent the uterus in its normal relations with the axis of the vagina. A small tumour on the posterior wall at *a* will, as before said, retrovert the uterus, but a similar-sized one attached low down on the cervix at *b* will as invariably antevert it. In the first instance the

uterus obeys the laws of gravity, by which an additional weight on one side of the fundus must pull it in the direction of said force; while in the second instance, the tumour finds a *point d'appui* in the utero-sacral ligaments, rectum, and cul-de-sac of the vagina, which oppose its downward pressure; and thus, as the tumour grows, it gradually pushes the fundus forwards.

For the same reasons a tumour anteriorly at *d*, as a rule, anteverts, while one at *c* invariably retroverts the uterus, because it finds a point of resistance in the walls of the bladder at its junction with the cervix. Another reason for this curious law of displacement in consequence of small growths on the supra-vaginal cervix may be found in the fact that the tumour acts like a splint upon the side of the naturally slender and flexible cervix. These rules are applicable to small tumours only, and all tumours must have had a small beginning. When they grow large enough to rest upon the brim of the pelvis, they elevate or depress the body of the uterus more by their volume and relations to the pelvic cavity than by the mere place of their accidental attachment.

I have in many instances seen the cervix curved anteriorly where it seemed to be produced by an amorphous growth on its posterior surface. The relative position and outline of this anomalous projection is represented in fig. 92, *a*. I do not know what to call it; it is not a fibroid tumour. To the touch it has a fibro-cartilaginous feel: I suppose I have seen a dozen cases of it. It is very uniformly of the shape and form here represented, always pointed below; it almost always projects, as

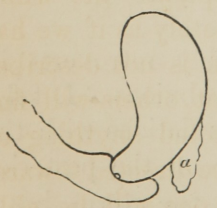

FIG. 92.

here, a little below the insertion of the vagina. I have never found anything like it growing on any other portion of the uterus. I have seen it in two cases in which there was no curvature of the cervix. Each of these was sterile, each had the cervix incised ; one conceived four months afterwards, the other in eight. Both of these had had metro-peritonitis some time before I saw them. From these two cases we may infer that this growth may possibly be the product of inflammatory action, and that it does not, *per se*, interfere with conception and child-bearing. In the other instances I could not trace its history to any predisposing cause. The first case of this anomalous growth that I ever saw was in the Woman's Hospital, in 1856, in a young Irish girl, who had painful menstruation as the consequence of a curved contracted cervical canal. Dr. Emmet and myself called it the cock's-comb excrescence. We called it this merely to give it a name. The name was suggested by the form of the growth, by its mobility, by its gristly feel, and by the manner of its attachment.

It has a sessile attachment to the neck of the womb, perhaps half an inch wide above, growing narrower as it descends. It can be diagnosed with the greatest facility by the bi-manual method of palpation. Indeed I never consider any obscure condition of the uterus thoroughly made out till we manipulate the whole surface of the organ almost as completely as if we had it outside of the body. This affection is not described in the books, but I have no doubt that others will find it where they have not, as yet, suspected anything of the sort; and the professional mind once directed towards it, I have as little doubt that some one will be able, some time or other, to give us its pathological appearances from post-obit examinations.

But to return to anteversions. We may have them from other causes. We often see granular engorgement of the anterior lip, accompanied by a corresponding engorgement, or hypertrophy of the anterior wall of the uterus. And here there is always anteversion. Some think that these corresponding conditions of the cervix and body anteriorly are pathologically one and the same thing; but we often see the engorged condition of the os and cervix cured without the least impression being produced, either on the hypertrophy of the anterior wall or on the relative position of the fundus.

We sometimes have the uterus bound down by ligamentous adhesions, the result, most probably, of some former peritoneal inflammation. These cases are comparatively rare; but that they do exist is proved both by observation on the living, and by post-mortem examination. We more frequently find ligamentous adhesions in retroversions than in anteversions.

Of course we can do nothing for the rectification of malpositions dependent upon adhesions, nor as a rule will they require any interference, for the adhesions naturally sustain and support the uterus in its abnormal relations, and protect it against the pressure of the superincumbent viscera, which would otherwise force it still lower in the cavity of the pelvis. In those cases in which I have found the uterus bound down by adhesions, there was little or no complaint of the symptoms ordinarily attendant upon such displacement.

So far as the treatment of the sterile condition in connection with anteversion is concerned, I fear that our efforts must be confined almost wholly to seeing that the os tincæ is open enough, that the cervix is of proper form and size, and that the secretions of the vagina and of the cervix are suited to the viability of the spermatozoa.

The introduction of the uterine sound by Simpson constitutes an era in obstetric surgery. Before this we knew as little about the rectification of displacements as we did about their diagnosis. It was, and is still, used as a redresser of displacements, in retroversions, with much show of science and precision, if not of skill and success; but in anteversions with none of these. As a mere probe, it is, as I have said before, very valuable, although the practised touch seldom needs its aid; but as a redresser, it is capable of doing great mischief, and should no longer be used as such. Even as a probe, merely to determine the course, curvature, and exact depth of the uterine cavity, it is possible to do harm with it.

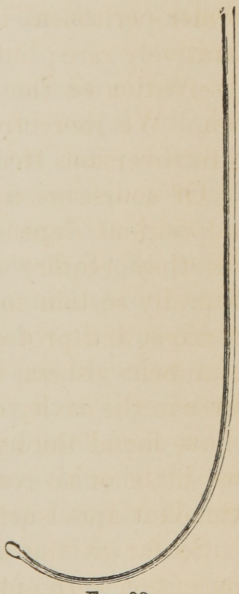

Fig. 93.

In anteversion I now seldom ever use it in the dorsal decubitus; but place the patient in the left lateral semiprone position, as for all uterine operations. When the cervix is brought into view, it is pulled gently forwards by a small tenaculum (figs. 14 and 53), and then the annealed probe (fig. 40), more or less curved to suit the previously ascertained or suspected curvature of the canal, is to be introduced with great gentleness. As soon as it passes the os internum, it goes to the fundus almost by its own weight, simply by elevating the handle of the instrument towards the sacrum. We can never do harm or even produce pain, if we adapt the size and curvature of the probe to the peculiarities of the individual case. We may occasionally need one not

larger than that shown in fig. 93, and we sometimes need to curve it quite as much in complete anteflexions, such as are represented in figs. 41 and 60.

Putting the cervix on the stretch by means of the tenaculum hooked into the anterior lip of the os greatly facilitates the use of the probe in difficult cases, by fixing the uterus and by straightening the curvature of the canal. I am sure that much harm has been done with the sound; 1st, by having it too large; 2nd, by having it too straight, or always fixed at the same curvature, as shown in fig. 39; and 3rd, by using too much force. Again let me repeat that we are never to forget that it is simply a probe, and that we are to handle it as delicately as we would a probe for any other surgical purpose.

While we then accept the sound as a probe, we must wholly reject it as a redresser. For diagnosis it is valuable; for treatment it is dangerous. During the learned discussion in the French Academy of Medicine a few years ago, on the uses and abuses of this instrument, the fact was fully established, that it had, perhaps more than once, been forced through the fundus uteri, and that death was the consequence of this rude and awkward accident. This could only have happened by using it with violence as a redresser. There is some show of philosophy to justify its use in retroversion, but why it should ever have been used to replace an anteverted uterus I cannot understand; and yet I have seen patients with anteversion, who had for months been subjected to the introduction of the sound almost daily; I need hardly add, without the least benefit.

To replace in this way, or in any other, an anteverted uterus with the expectation of its remaining in a normal position by this means alone, is perfectly futile; for it

invariably falls back into its abnormal position the very moment that the force is removed that replaced it.

For the replacement of an anteverted uterus we need no instrument whatever. The process is simple enough, and is effected easier and better by mere manipulation than by any instrumental aid. The bladder empty, the patient on the back, introduce the left index finger, as shown in fig. 1, to the anterior cul-de-sac; make pressure outwardly with the other hand, to be sure that the uterus is anteverted; then remove the outer pressure, and with the index finger still resting a little anterior to the cervix, elevate the os tincæ in the direction of the pubes, by carrying the anterior wall of the vagina on the point of the index finger up behind its inner face;—this pressure bringing the cervix forwards and upwards, necessarily elevates the fundus from its bed behind the pubes and throws it slightly upwards;—now push the ends of the fingers of the right hand on the outside from above, down into the hypogastrium closely behind the pubes, so that the fingers of the two hands shall feel that there is nothing between them but the thin walls of the abdomen and the thinner walls of the vagina and bladder. While the right hand is thus held firmly, the fingers occupying, as it were, the place just filled by the fundus uteri, quickly slide the left index from the anterior to the posterior cul-de-sac of the vagina, and push this before it till the finger lies snugly up behind the cervix uteri; then elevate it, as it were, against the points of the fingers of the right hand, with which push back the fundus, and retrovert the whole organ while we hold it up almost in contact with the abdominal parietes.

Thus we are able not only to straighten up the

organ, but to manipulate every portion of the external surface of the uterus: the fundus and body, before we attempt to replace it (fig. 1); the remainder by the above manœuvre.

This is ordinarily easily done, even in very fat women, because nature provides a sulcus between the fatty deposit in the walls of the abdomen, and the pubic covering in which the outer hand is readily carried down behind the pubes as above directed.

We only find trouble in delicate, nervous, hysterical women, where there is involuntary spasm of the abdominal walls, or where the cervix uteri is firmly held back by shortened utero-sacral ligaments.

It is by thus passing the left index finger behind the cervix uteri, and then drawing the whole organ directly forwards, almost against the inner face of the pubes, and pushing the ends of the fingers of the outer hand down behind the uterus instead of before it, that we can diagnose with the greatest accuracy fibroid tumours, whether sessile or pedunculated, and such offshoots as are represented in fig. 92, page 236. It was but the other day that a friend of great eminence in the profession asked my opinion in reference to a fibroid suspected to be in the posterior wall of the uterus. He was hesitating whether to attack it through the cavity of the uterus or through the cul-de-sac of the vagina. By this bi-manual method of palpation alone, I was able in a moment to say that the tumour, nearly as large as the fœtal head at term, was pedunculated, and that the pedicle, about an inch long and three-fourths of an inch thick, was attached to the posterior face of the uterus, about half-way between the insertion of the vagina and the fundus uteri (fig. 94). It is not necessary to say more about the peculiarities of the case here, except that in the

course of a few minutes my friend was perfectly convinced of the exactness of the diagnosis.

But to return to the subject of anteversion. So far as the mechanical treatment of anteversion *per se* is con-

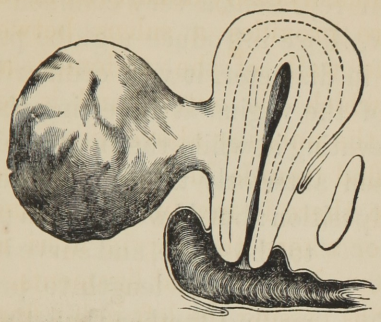

Fig. 94.

cerned, I know of but one instrument that has the power of rectifying the position perfectly and at once, and that is the intra-uterine stem (with disk) of Dr. Simpson. But unfortunately the risks of the instrument are too great; and I know but three practitioners in my own country who have not, after repeated trials, discarded it altogether. These are Professor Peaslee and Professor Conant, of New York City, and Professor Mack, of Buffalo.

In the practice of the Woman's Hospital, Dr. Emmet and myself were long ago compelled to discontinue its use, on account of frequent accidents, such as hæmorrhage, metritis, and pelvic cellulitis. Sometimes a small Meigs's gutta-percha ring will afford relief, not so much by rectifying the position as by elevating the organ slightly in the pelvis, and taking some of its weight from the bladder. Sometimes we derive considerable comfort from a small globe pessary, particularly if it can be made to rest just anterior to the cervix uteri. For

this purpose I have now and then attached a stem to the globe, which projects externally, and is curved up over the pubes, to prevent the ball from running down into the posterior cul-de-sac.

Fig. 95 will represent a very common form of anteversion. Now, if we introduce a globe pessary an inch and a quarter in diameter, it will ordinarily pass to the very bottom of the vagina at *a*, resting there under the cervix, and elevating it, while the fundus will be thereby rather depressed anteriorly than otherwise; thus aggravating the malposition: but if we attach a malleable stem to the globe, and curve it externally at the proper length to prevent it from passing further than the anterior cul-de-sac, its tendency is to throw the fundus upwards in a normal direction by its pressure or traction on the anterior wall of the vagina at *b*. Its action is readily understood by pressing the index finger forcibly up behind the symphysis pubis, which easily elevates the anteverted uterus. If the ball be too large, its pressure here will retrovert the uterus, just as a tumour growing low down on the cervix anteriorly will throw the fundus backwards.

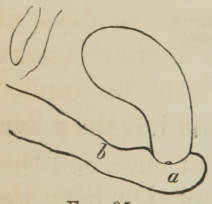

FIG. 95.

But all instruments with external projections annoy and irritate a naturally sensitive nervous system, already rendered more irritable by disease, and are to be avoided if possible.

It was the fashion a short time ago to use a sponge, with a string for its removal. To this practice there are two serious objections: 1st, nothing could be more disgusting than a sponge thus worn for six or eight hours; and 2nd, the sponge always swells considerably by absorbing moisture, and soon patients feel the need

of increasing its size, and they generally get to introducing two instead of one. The patient that once contracts the habit of wearing a sponge in the vagina will find it very difficult to break it up.

But what is better than this, and, indeed, better than almost anything of the sort, is the application of a small wad of cotton, not more than an inch in diameter when moderately compressed, which may be used simple or moistened with glycerine, or otherwise medicated. Instead of expanding, it gets smaller by the pressure of the parts. A pessary of simple cotton should never be retained more than twenty-four hours: moistened with glycerine, it may be worn two or three days, or till it come away spontaneously. The cotton pessary secured with a string for its removal, is to be applied by means of a porte-tampon, described and figured further on.

In very aggravated cases of anteversion, where the whole organ lies flatly down on the anterior wall of the vagina and parallel with it, we often, indeed almost always, find the vagina unusually deep, with the anterior wall greatly elongated. For such cases I devised and executed an operation in 1857, which has answered a most admirable purpose.

It was under these circumstances. A lady was sent to me by Professor Josiah C. Nott, of Mobile, Alabama, in December, 1856, who had a most complete anteversion, the fundus uteri being drawn down behind the inner face of the pubic symphysis by a fibroid tumour on the fundus anteriorly. Fig. 96 represents the relative position of the uterus and tumour *a*. I have never seen a more complete anteversion. The diagram does not in any way exaggerate any of the details of the case. She had a cervical leucorrhœa, which was cured in a

few weeks; but the cystorrhœa, vesical tenesmus, and malposition, with its other inconveniences, persisted. For the relief of the displacement I tried all sorts of pessaries, but nothing did any good. The pelvis was

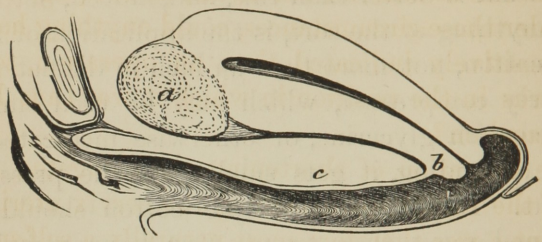

Fig. 96.

deep, the vagina capacious, the anterior wall unusually long, and the uterus laid down on and parallel with it.

I discovered that the malposition could be entirely rectified by hooking a tenaculum in the anterior lip

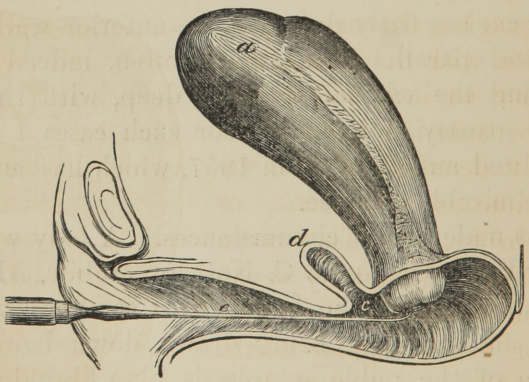

Fig. 97.

of the os tincæ, and drawing the cervix down towards the urethra. By continuing this traction till the cervix was brought forward about an inch and a half, the fundus rose up in the pelvis into rather a normal position, not-

withstanding the weight of the tumour on its anterior portion. When the os tincæ was thus drawn forwards, the elongated, relaxed anterior wall of the vagina was naturally folded upon itself, presenting the appearance of an enormous anterior cul-de-sac, as at *d*, fig. 97.

Under these circumstances, could anything have been more positively indicated than an operation, to retain the uterus in the position in which it was thus held by the tenaculum?

The operation of shortening the elongated anterior wall of the vagina, by attaching the cervix uteri to it at the point *c*, was therefore most naturally a self-suggested affair. It was very simple, and as a mere operation must always be a successful one; whether it will, when successful, always produce relief of suffering, time and further experience can alone determine.

Two semilunar surfaces a half-inch wide, and running nearly across the anterior wall of the vagina, the one in juxtaposition with the cervix, and the other an inch and a half or more anterior to it, were carefully denuded of the vaginal mucous membrane, as shown in fig. 98. They were then closely united by seven silver sutures, as in the operation for vesico-vaginal fistula. The patient was put to bed, and a self-retaining catheter worn for a few days; after which the urine was drawn off when necessary. At the end of ten or twelve days the sutures were removed, the union of the two sur-

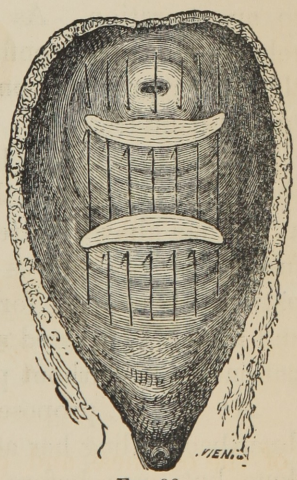

FIG. 98.

faces being perfect. The patient retained the recumbent posture for a week longer, to allow the cicatrix to get strong enough to resist any traction that might be made by the bladder, rectum, or uterus itself.

The uterus was held as nicely in its proper position by this bridle of vaginal tissue as it was previously by the tenaculum; and fortunately she was wholly relieved of the suffering symptoms, of which she had so long complained before the operation.

Twelve months afterwards this lady gave birth to a son. I saw her husband a year after the birth of the child, and he reported his wife as enjoying most excellent health, never having felt the slightest symptoms of her old troubles at any time since the operation. I am sorry to say I have performed this operation in but two other instances. I have seen many cases suitable for it, but they have been satisfied to put up with some clumsy mechanical contrivance rather than submit to an operation. As I have not seen the case above related since the confinement, I cannot say what effect the labour produced on the cicatrix, but I should expect to find it intact.

In 1859, a young lady aged twenty-six was sent to the Woman's Hospital with just such an anteversion as the one above related, except that the fibroid on the fundus of the uterus was much larger. She was a patient off and on for twelve months, and Dr. Emmet and myself exhausted all our mechanical ingenuity (and patience too) without producing the least benefit.

At last I proposed to her the operation above described, telling her at the same time that it had been done but once before. She readily accepted it; and the operation was performed in May, 1860, with perfect success, and with almost entire relief to all her suffer-

ings. I have seen this young lady repeatedly since; the last time in July, 1862, being then twenty-six months after the operation, and the uterus remained just as it was when she first left the Hospital.

I performed this operation a third time in 1860, at the Woman's Hospital; the patient left soon afterwards, and as I have not seen or heard from her since, I cannot say what was its effect upon her health; but the operation, as such, was as successful in every particular as in the other two instances.

I would not be understood as recommending this operation as a universal one in anteversion. It is to be resorted to only when the anterior wall of the vagina is unusually long, and when the uterus lies down parallel with it, presenting the fundus just behind the inner face of the symphysis pubis.

Of Retroversion.—While the table on page 231 shows that about one-third of all sterile women have anteversion from some cause or other, it also shows that another third suffer from retroversion; although these two forms of displacement vary in the two classes of natural and acquired sterility; the anteversions, as before stated, predominating in the first, and the retroversions in the second.

The uterus is retroverted when the fundus falls backwards under the promontory of the sacrum or whenever it passes an angle of 45° in that direction from its normal position. But, as before said, it never stops at 45°, seldom at 90°, and often goes to 135°. Thus we may have different degrees of this version. We can ordinarily diagnose a retroversion by the bi-manual method of palpation, already more than once described; but if at any time we are in doubt, the

uterine probe will easily, and with great certainty, settle the point. If we find a tumour in the retro-uterine region, and doubt whether it be the fundus of the uterus or not; and if we can pass the probe into it to the depth of two inches and a half, then it is the fundus; but if it pass two inches and a half or more in some other direction, then it is not the fundus. There is no need of our ever being in doubt as to a retroversion. The physical signs elicited by the touch and the probe are invariable and indubitable. I have already said so much on these two methods of diagnosis, that more is here unnecessary.

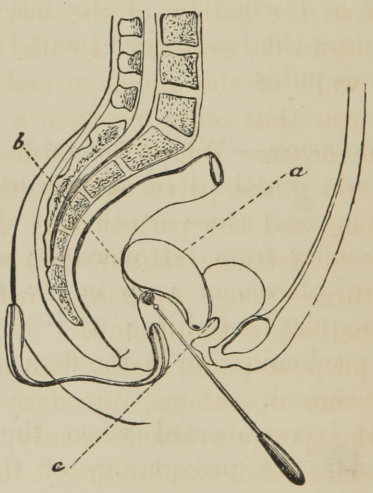

Fig. 99.

Fig. 89, page 228, represents the uterus in a normal position. Fig. 99 represents the uterus retroverted from its normal position *a* to an angle of at least 90°. In retroversions like this there is ordinarily a greater degree of vesical tenesmus than in anteversions. This is

explained by the fact that in the one the neck of the bladder is the seat of pressure, while it is the fundus in the other. The diagram represents the manner in which the neck of the bladder may be jammed against the symphysis pubis if the uterus is much hypertrophied. Here it is not relatively augmented in its long diameter. It also shows how awkwardly the fundus of the bladder is pulled back by its attachment to the cervix uteri, and how the cervix occupies the place, as it were, of the *bas fond* of the bladder.

It is possible in many instances to replace a retroverted uterus by manipulation alone, simply by pushing the cervix back with the index finger till the os looks in the direction of the hollow of the sacrum, and as the fundus rolls upwards, grasping it with the outer hand through the walls of the abdomen and pulling it forwards. We can thus often produce a complete anteversion of the organ. But it is not always easy to do this, particularly if the pelvis is deep, the uterus large, the vagina long, and the patient fat. It is then necessary to resort to instrumental aid, the simplest of which are two or three sponge probangs, with sponges not larger than the ball of the thumb.

For this purpose place the patient on the left side, as for all uterine operations, introduce the speculum, push one of the sponge probangs gently, firmly, forcibly into the posterior cul-de-sac, holding it there steadily till the cervix uteri is raised from its contact with the anterior wall of the vagina; then place the other sponge against the cervix anteriorly, and gently push it back towards the posterior cul-de sac, at the same time that the pressure is continued by the first one. This will generally roll the fundus over forwards, and elevate it from its bed in the utero-rectal pouch.

Thus let fig. 99 represent a retroverted uterus with the speculum and the first sponge probang *in situ*. The pressure with the probang must be made in the direction of the dotted line *b* under the fundus uteri, directly towards the hollow of the sacrum, or in other words, in the direction of the proper axis of the vagina. The tendency of this is at once to throw the fundus upwards, by tilting the cervix downwards and backwards. When this has been carried as far as possible, then the pressure of the second sponge against the anterior face of the cervix completes the rectification of the malposition,—provided we are careful to make the pressure in the right direction. If the handle of the sponge probang be carried far back towards the perineum or the blade of the speculum, in the direction of the dotted line *c*, it will strike against the cervix uteri or in the anterior cul-de-sac, and of necessity retrovert the uterus to a greater degree, by pushing the cervix upwards and forwards instead of downwards and backwards. But if the handle of the probang be kept close to the urethra, the pressure will be made in the direction of the line *b*, which necessarily causes the uterus to revolve on its own axis, the cervix taking the relative position just occupied by the fundus, while this rises up above the promontory of the sacrum. We shall generally, but not always, succeed in this simple way in restoring the uterus to its proper position.

If we produce any pain by this process, it will be in consequence of pressure against the hypertrophied tender posterior wall of the uterus, or against a prolapsed supersensitive ovary, or something else abnormal, in the Douglas cul-de-sac, all of which it is important to ascertain by the touch before making efforts at replacement. Then if we use two sponge probangs for

pressure in the posterior cul-de-sac instead of one, we avoid the production of pain; but instead of pushing the sponges back in a direct line, centrally over the os tincæ, we cross them, laying one on the left side of the cervix, and the other on the right, as shown in fig. 100, *a b*. They will naturally cross just over or very near the urethra. I have had them fastened together at the crossing, making one automatic machine of the two; but this does not answer so well, because we may sometimes need to change the point of pressure of one probang and not of the other. We may not only need to change the direction of the force, but we may also wish to use more or less with one than the other; and we can do all this with greater facility with the two sponges as they are.

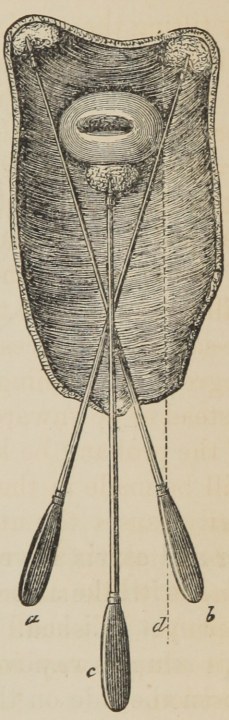

FIG. 100.

For instance, suppose we wish to change the pressure of the probang *a* more to the left, the handle is at once thrown to the right and it takes the direction of the dotted line *d;* and in like manner we may act with *b*. When we are satisfied that the fundus has been rolled up out of its old bed, which is to be presumed when the os tincæ looks directly back towards the posterior wall of the vagina, instead of towards the symphysis pubis, then we are to apply the probang *c* against the cervix, and push this in a straight line backwards.

Fig. 101 shows the uterus somewhat elevated from its abnormal position, towards the promontory of the sacrum. We may push the organ up thus far, and suppose that we have reduced the dislocation, because the

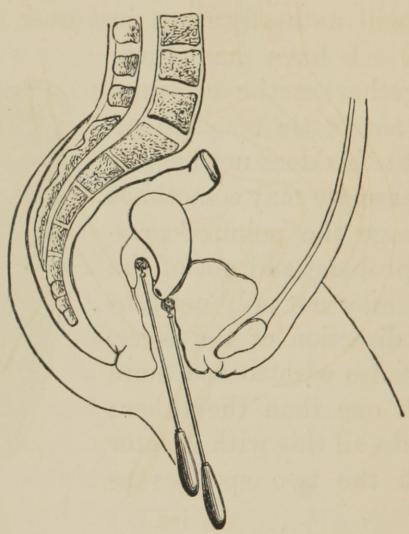

Fig. 101.

os and cervix have been forced back into a normal relation with the axis of the vagina. But the operation is not yet finished. Holding the sponges in position, the speculum is removed, and the patient requested to turn from the side on the back; then pass the left index finger into the vagina, and place it against the anterior face of the cervix; hold it firmly there, and remove the sponges, one at a time; then while the cervix is still pushed backwards by the finger, bring the other hand to make the outer pressure (bi-manual). If we can with this grasp the fundus of the uterus, and bring it towards the symphysis pubis, then we are sure that we have suc-

ceeded; if not, we have only crowded the cervix backwards, flexing it upon itself and leaving the fundus in its abnormal position, almost as it was before (fig. 102).

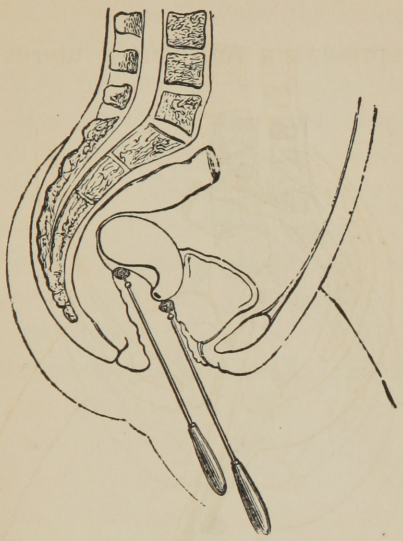

Fig. 102.

This is more apt to happen when the pelvis is deep, and the supra-vaginal portion of the cervix is long and slender. If our patient is too much fatigued to change her position to the dorsal decubitus for the bi-manual examination, we can ascertain the degree of success of the effort at replacement by passing the uterine sound while the patient is still on the left side. If it pass easily the proper distance in the direction of the normal position of the uterus, then it is all right; bnt if it pass back towards the hollow of the sacrum, then it is all wrong.

It is better not to fatigue our patient too much, and if we do not succeed to-day, it will be as well to wait

till to-morrow. When we attempt anything of this sort, we must always be sure that the bowels are not constipated; and we must not forget to have the bladder emptied before trying to reduce the dislocated uterus.

Fig. 103 represents a retroverted uterus completely

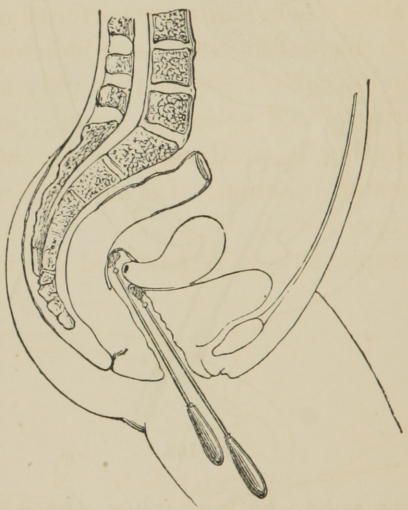

Fig. 103.

restored to its normal position by the pressure of two sponge probangs alone.

We often succeed by the simple process above detailed; but suppose we fail in our second effort, or suppose we are in doubt about adhesions binding the fundus down in its abnormal position, what are we then to do? We then proceed otherwise; and it is here absolutely necessary to use an intra-uterine force.

Dr. Simpson was the first to teach us how to diagnose, and how to rectify a retroversion. He passes his uterine sound to diagnose the position, and then turning

it half a circle, the retroverted fundus is necessarily elevated towards the promontory of the sacrum. But as I have frequently said before, this operation often produces great suffering, and sometimes hæmorrhage, and I have not for many years used Simpson's sound as a redresser. I have not seen any more serious accident from it. Some object to the instrument, and ostracize it altogether; because perforation of the fundus and death have followed its injudicious use. This is not wise or logical. I object to it only as a redresser. Its whole principle of action is wrong; and hence the pain and suffering it produces. I only wonder it has not done greater mischief. Let us for a moment look at its *modus operandi.*

Fig. 104 represents a retroverted uterus with Simp-

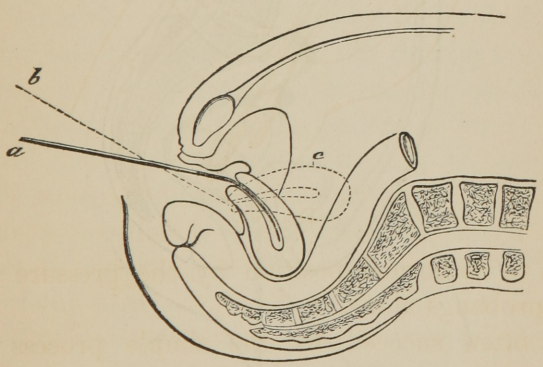

Fig. 104.

son's sound introduced as a redresser. Now, if we turn the handle of the instrument *a* on its own axis half a circle, the distal end will elevate the uterus from its abnormal position to that shown by the dotted figure *c;* but in doing this it will describe a semicircle of but little less than two inches and a half radius,

sweeping the fundus round with the whole weight of the organ, supported principally on the very end of the instrument, which in its gyration changes its point of pressure from the posterior to the anterior face of the uterine cavity. To elevate the fundus still more, we push the handle *b* back towards the perineum, which thrusts the uterine end upwards. Is it to be wondered at, then, that we occasionally meet with patients who look upon the uterine sound with the most painful recollections? Seeing that an intra-uterine force was occasionally absolutely necessary for the rectification of this malposition, I devised the following instrument in

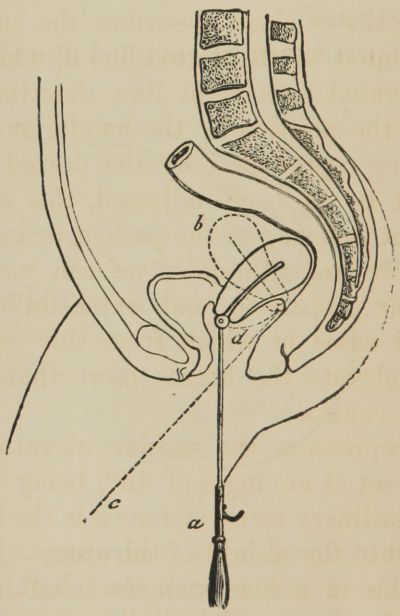

FIG. 105.

1856, and have used it ever since. Its whole principle of action is that of elevating the fundus in a straight

line instead of a circle, and of supporting the weight of the organ on a disk at the os tincæ instead of the distal end of the instrument at the fundus. For this it is only necessary to make a joint or hinge in the sound, about two inches from its uterine extremity, and fix a disk or plate there, as a point of support for the weight of the uterus. For instance, let fig. 105 represent a retroverted uterus, with a jointed sound *a* introduced, the joint being at the os. Now all that we have to do with such an instrument is to push the mouth of the womb downwards and backwards into the posterior cul-de-sac in the direction of the place which was at the inception of this movement occupied by the fundus. By this manœuvre the os tincæ describes the small arc of a circle represented by the dotted line *d*, while the fundus, being elevated in a right line, describes a larger one, and takes the position *b;* the handle or shaft of the instrument being represented by the dotted line *c*. If the instrument be properly adjusted, this operation is effected without suffering to the patient or injury to the uterus. If there are adhesions, we can measure very accurately their resistance and extensibility. I now remember two cases in which from this cause it was impossible to elevate the uterus more than 45° above the axis of the vagina.

Fig. 106 represents the uterine elevator with the uterine stem A set at an angle of 45°, being the proper angle for an ordinary retroversion: C is the ball or disk for the support of the weight of the uterus. It revolves on its own axis in a line with the shaft, permitting the stem A to describe a whole circle, except 90°,—45° on each side of the shaft. This ball is perforated with seven holes (the stem occupying the eighth), made in a line around its centre, for the reception of a pointed

rod, concealed in the tubular shaft, which is pulled down by the ring B, and flies back again when we let the ring go, so that the movements of the uterine stem A can be promptly arrested at any desired point in its elevation, simply by letting go the ring B, which, with the rod, is driven up by a hidden spiral spring in the handle below. The little perforations in the ball are placed intentionally at the proper distances to mark off angles of 45° in the revolutions of the stem.

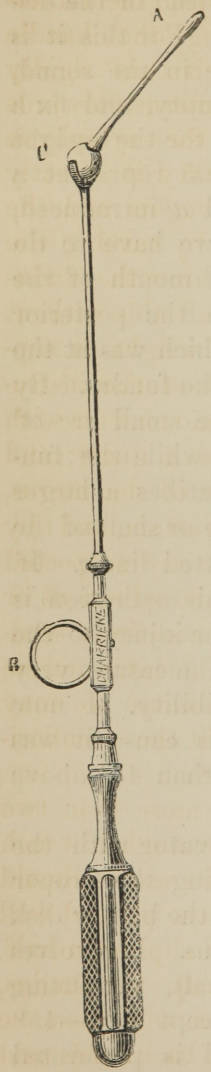

FIG. 106.

This instrument is simply Simpson's sound with a joint or hinge two inches from its uterine extremity; but its modus operandi is very different. One elevates the uterus in a right line; the other in a circle to the right or left: one supports the weight of the organ on a ball at the os; the other principally on the point of the sound in the uterine cavity: one elevates the uterus by a power exerted on the cervix; the other by a like power on the fundus: one seldom produces pain, the other often does.

This instrument is sometimes valuable in assisting us to diagnose the relative position of small tumours on or near the uterus. Thus, suppose we have the uterus impaled with the stem A at

right angles with the shaft, its body being thus held firmly in the centre of the pelvis, with the fundus pointing to the umbilicus,—by pulling the handle of the instrument forwards while it is thus rigidly fixed, we can draw the body of the uterus towards and very near the inner face of the symphysis pubis; by pushing it back, we can carry it directly backwards as far as the depth of the vagina and the sacral promontory will allow it to go; by turning the handle from side to side, we can at will throw the fundus to the right or left, as we please, and all this without injury to the organ itself, for its whole weight is supported, as before said, not on the point of the instrument, as when we execute any of these movements with Simpson's sound, but on the disk at the os tincæ; and while we are thus changing the position of the uterus, we can by a finger in the vagina or rectum, and by palpation externally, determine whether any suspected tumour be attached to the uterus by sessile adhesions or by ligament only, or whether the two be entirely separate and independent of each other. The intra-uterine portion of the elevator is malleable, because we may sometimes wish to curve it a little to suit the peculiarities of some special case.

Ordinarily this stem should not be more than two inches long. It should never be long enough to touch the fundus uteri by any possibility. In its use we should be careful to keep the ball or disk always pressed well up against the os tincæ; for if it should slip down half an inch or more, we shall fail to elevate the fundus, as the whole power of the instrument will then be expended only in pushing the os tincæ backwards and doubling the cervix on itself.

I published an account of this uterine elevator in the

January number of the *American Journal of the Medical Sciences* for 1858; and since then it has been variously modified by different writers, but not at all improved. Dr. Gardner and Dr. Dewees, of New York, and others, have added a screw to move the stem, which is objectionable, because it robs us of the faculty of determining the power of resistance by the sense of feeling. When we have a freely movable joint, as in this instrument, it is easy to judge of the weight of the uterus, and to determine the amount and degree of adhesions, when present, by noting the exact point at which we feel their resistance.

But suppose we elevate the uterus, whether by this means or any other, will it remain in its normal position simply by placing it there? Never. I have known physicians to replace a retroverted uterus day after day for months, but I never knew a case cured by it. It is certainly important in many cases to rectify the malposition, but more than this remains to be done to render it permanent. For this purpose the organ must be not only replaced, but it must be retained in its normal position by some mechanical means. In old cases, where the uterus is tender and irritable, it will be well not to resort to a pessary at once. It is better to replace the uterus a few times and apply simply a wad of cotton wet with glycerine, for the double purpose of supporting the uterus *in situ* for a while, and of removing engorgement by the depleting power of the glycerine already described (pp. 71, 72, 158). Whenever by this means or others we remove all irritability or engorgement that may have been present, we must adjust a pessary of some sort to hold the organ in its normal position.

Much has been written on the subject of uterine displacements, and very opposite views have been enter-

tained of its treatment. Some look upon it as a matter of no great importance, while others are ready to attribute to it every nervous symptom that the patient may suffer. Some condemn pessaries and ostracize them altogether, while others advocate them perhaps too universally. Like most disputed points, there is some truth on both sides. I have seen much harm produced by pessaries, and so have I by bleeding, by purgatives, by opium, by quinine, and by other powerful remedies; but I do not see why we should wholly repudiate remedies or instruments because they have been used injudiciously. I have also seen much benefit from the application of the principles of mechanics to the treatment of uterine displacements, but I am well aware that there are circumstances under which they are inapplicable.

I have seen cases in which Simpson's intra-uterine stem (fig. 107) had produced very serious results, such as metro-peritonitis. I have seen Hodge's open lever pessary (fig. 110) dig holes in the anterior walls of the vagina almost through into the bladder. I have often seen Meigs's ring-pessary (fig. 111) cut a sulcus in the posterior cul-de-sac of the vagina deep enough to burrow the finger in. I have seen Zwang's pessary (fig. 108) sever the urethra from the neck of the bladder, cutting quite down to the vesical membrane, but not through it. I have known one case where the disk of a vaginal stem-pessary (fig. 109) passed into the cavity of the uterus, and remained incarcerated there for several days, with the cervix closely contracted around the stem, till it was removed by Professor Lewis A. Sayre, of the Bellevue Hospital College, New York; and I have seen Gariel's India-rubber bag-pessary inflated till it distended the

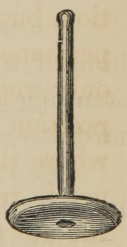

Fig. 107.

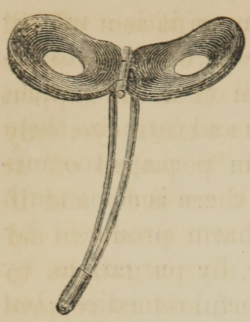

Fig. 108.

vagina so enormously that it seemed to occupy almost the whole of the pelvic cavity; and I have heard of other pessaries producing fistulous openings into the rectum and the bladder. But notwithstanding all this, I advocate and daily use pessaries in some form or other; because, if I did not, I should turn away a multitude of cases without doing anything at all for their relief. Pessaries are necessary evils. We should always do without them if possible; but if it be impossible, then it is the part of wisdom to resort to such appliances as will best answer the indications of the individual case.

Fig. 109.

The man who is not a mechanic should never trust himself to use a pessary. Even with a correct understanding of uterine mechanology, we will often make mistakes,—

1st. In resorting to pessaries where there is metritic inflammation in some form.

2nd. In selecting an inappropriate instrument.

3rd. In making it too large; sometimes too small; and

4th. In allowing it to remain too long without removal.

Even if we feel pretty sure of the form of the instrument as applicable to the case, it is difficult for us to get our ideas of the size of the vagina down to a proper level. We more frequently make them too large than too small. After we succeed in getting the pessary to

fit accurately, we should never send our patient off till she is taught to remove and replace it with the same facility that she would put on and pull off an old slipper. A pessary is a thing to be worn like a glass eye, only when awake. As a rule, it should be pulled off at night, and put on in the morning, if needed; and if every poor woman who is compelled to use such an aid for the support of the uterus, was always taught to understand the principles of its action, and to remove and replace it every day or two, there would be none of the accidents alluded to above, to damage their reputation for usefulness. But the greatest mistake that we make is that of taking a single model and applying it universally. What would be thought of the hatter who expected one hat to fit every head? Of the shoemaker who expected one shoe to fit every foot? Of the dentist who expected the cast of one alveolar arch to fit every other? The idea is most preposterous; and yet we have been but little less wise in our mechanical treatment of uterine displacements.

I have seen the inside of an immense number of vaginas, and I never saw two that were in all particulars exactly alike. They are as different from each other as are our faces and noses. In Mr. Préterre's (of Paris) great collection of palatine fissure-casts, numbering now some 600 or more, each one has its peculiar anomalies, and each its peculiar apparatus. I would not be understood as meaning that 600 cases of uterine displacement would need as many differently constructed instruments; but I mean this, that every individual case is a study of itself, and that its complications and peculiarities must be investigated, understood, and respected, if we expect to treat them safely and successfully. But as I intend to deal here with pessaries only in relation with the

sterile condition, further general remarks are uncalled for.

I do not pretend to say that a retroverted or an anteverted uterus is incapable of conception ; but of this I am certain, if conception occurs when the uterus is greatly anteverted or greatly retroverted, it is rather accidental than otherwise, and would have occurred with greater facility if this organ had been in a normal position, other things being equal.

When we call to mind the fact that of 255 cases of acquired sterility (page 231), 111 had retroversion and 61 anteversion; and of 250 cases of natural sterility, 68 had retroversion and 103 anteversion, we may have a right, as I have said before, to suspect that the position of the uterus is a matter of some importance in the treatment of the sterile condition. Of course many of these cases of malposition were complicated with fibroids, or flexures, or engorgements, or hypertrophies, or a conical cervix in those who have never borne children. But even if all these be rectified, we may still have sterility as a consequence of malposition alone. At all events, the frequency of malposition renders it an important element in the treatment of the sterile condition.

Although I have been for a long time aware of the fact that malposition of the uterus had much to do with sterility, I never had the slightest idea of treating this last in connection with the malposition till 1855; and it occurred to me in this way. I was consulted in July, 1855, by a lady who had been under the treatment of Professor Hodge, of Philadelphia. The history of her case gave the following facts. She was twenty-three years old, married at seventeen, in July, 1849; had a two months' miscarriage in March, 1851,

from which she slowly recovered, and was sent to Professor Hodge by her medical attendants in May following. He found the uterus retroverted, and applied his pessary immediately. She remained in Philadelphia seven weeks; had but one menstrual period after the pessary was applied; and returned home still wearing it. Her physicians there pronounced her pregnant, but did not remove the instrument till September, and her child was born in March following. This appeared to me at the time a most remarkable revelation; and I asked this lady how it happened that she had sexual intercourse while she wore an instrument. She replied simply, "It happened so." "Often?" said I. "Oh, yes; just as if there had been no instrument there." The idea of adjusting an instrument that would permit sexual intercourse at the same time that it held the uterus *in situ* was to me a novel one. Since then I have acted upon it, and think it of great importance.

Hodge's instrument, as first invented by him, is made of silver and then gilt. It is in the shape of the letter U, with the two parallel branches curved on the flat to suit the curvature of the vagina.

Fig. 110 represents the instrument. The cross-bar connecting the two branches is to be pushed up behind the cervix uteri after the organ is replaced; the great convexity of the branches rests on the posterior wall of the vagina; and the open end looks in the direction of the symphysis pubis; while the extremities of the branches rest anteriorly, one

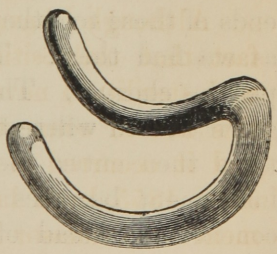

Fig. 110.

on each side of the neck of the bladder. Theoretically and practically the instrument is admirable, when neatly fitted and properly managed. Its expensiveness was the chief objection to its general use. Dr. Hodge modified his instrument for ante-versions, by placing a cross-bar on its front or open end, thus closing it up entirely, and making a sort of sigmoid parallelogram of it (fig. 112). This form of the Hodge instrument is commonly adopted by the profession in my own country, whether it be made of silver, block-tin, vulcanite, or gutta-percha. We seldom use the other one.

Hodge's instrument may be found in the shops variously modified. For instance, they are made of hard rubber, and sold in great quantities; but these are very dangerous, for they are generally too large, and are fashioned into anything but the right shape; and I have found it impossible to give them the proper equilateral curvatures by heating them in boiling water as is recommended. What is better than the hard rubber, but not so cleanly, is a copper wire covered with gutta-percha. But even here we have a right to complain of all our instrument-makers; for they have taken the common insulated telegraphic wire, cut it into slips of various lengths, and most clumsily fastened the two ends of these together in a ring, and then curved them as we find them. They do this to sell them a few pennies cheaper. This is poor economy; for they often get fractured where they have been joined; the secretions then enter the little cracked fissures, and the instrument becomes a source of irritation instead of comfort. Instead of this, the malleable copper wire should be first made neatly into a ring or parallelogram, and then smoothly covered with gutta-percha, not varnished. I have persuaded at least two instrument-

makers (Mr. Weiss and Mr. Charrière) to remedy this evil. Away with cheap things! whether drugs or instruments, for our sick, especially for our sick women; and more especially still when they are afflicted with such fearful calamities as we are now considering.

But my country holds another name equally as honoured and respected, and equally as authoritative as that of Hodge, in advocacy of the mechanical treatment of uterine displacements. In 1853, Professor Charles D. Meigs published his report on uterine diseases before the American Medical Association, in which he promulgates the same views so long taught by his illustrious confrère, Professor Hodge. Dr. Meigs's instrument differs from Hodge's, but its principle of action is the same. While Hodge's is a curved parallelogram, Meigs's is simply a ring, acting upon the same principle of distending the vagina antero-posteriorly, by making the posterior cul-de-sac and the inner face of the symphysis pubis the points of support. It, too, holds the neck of the womb back in its proper place, and does not interfere with sexual intercourse. Meigs's ring pessary is made of watch-spring, fashioned into a circle, two, two and a half, two and three-quarters, and three inches in diameter, and then coated with gutta-percha (fig. 111).

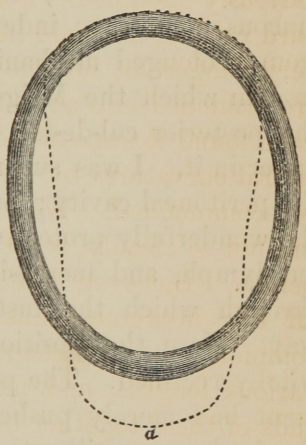

Fig. 111.

It is introduced with great facility, by compressing its opposite sides, thus elongating it in one direction,

—dotted line *a*, while its diameter in the other is diminished. As soon as it passes the arch of the pubes, it recovers its original form, but seldom ever becomes perfectly circular again, unless it is a very small instrument. If a large one, it takes an oval form after being worn for any length of time.

These are often worn for a good while; but in a general way, as before stated, I am opposed to the principle. I have often removed the Meigs ring-pessary after it had been worn continuously for ten or twelve months. In five or six weeks it becomes coated with a thick layer of brownish sordes, having a most disgusting smell. This, of itself, must irritate the vaginal mucous membrane, independently of mischief resulting from prolonged mechanical pressure. I have seen one case in which the Meigs ring had ulcerated a sulcus in the posterior cul-de-sac deep enough to hide the little finger in it. I was surprised that it had not perforated the peritoneal cavity; but a close investigation revealed the wonderfully protective powers of nature in throwing out lymph, and increasing the thickness of the tissues through which the instrument had gradually cut its way. Here the position of the womb had not been wholly rectified. The pelvis was deep, and the instrument had merely pushed the cervix backwards, while the fundus was still retroverted. Perhaps this was well for the patient, for the cul-de-sac of the vagina and the posterior wall of the uterus seemed to be agglutinated firmly together,—doubtless the result of the pressure and ulceration of the ring, for I had examined this case some months before the ring was applied, and there was nothing of the sort then.

I saw another case at the Woman's Hospital in 1861, where a Meigs ring had been worn continuously for

nearly twelve months. At first it produced great relief, but after a while there was an excessive muco-purulent discharge from the vagina, and it was for this that advice was sought at the Hospital.

We often see pessaries of this sort produce mischief by being too large, but here it was the contrary. The cervix and a portion of the anterior wall of the vagina seem to have gradually descended too far through the small ring, and to have become almost strangulated. It had cut a deep circular sulcus all around the cervix, deeper posteriorly and on the sides than anteriorly; and in this sulcus the ring was entirely hidden from view except just at the neck of the bladder, where it was more superficial. On the removal of the instrument, which was both difficult and painful, its bed was seen to be a deep suppurating chasm, with granulating edges that had entirely overlapped the ring behind and on the sides. The cervix uteri was also very granular, and greatly engorged, seemingly in consequence of the strangulating pressure of the ring. All of this disappeared with the filling-up and healing of the sulcus, which occurred in the course of a fortnight.

While I advocate, and daily use pessaries of some sort, it is but just that I should say all I know against them, simply as a warning of danger to others. In this case the fault was with him who applied the instrument, and turned his poor patient adrift without giving her instructions in its use. I have seen more mischief from the Meigs ring than from Hodge's instrument. I presume the reason is, that when it was first introduced it was a cheaper instrument than any other then in vogue; was therefore more universally used; and, consequently, presented comparatively larger opportunities for observation.

If the object be to cure the sterile state while we

treat the malposition, I always use an instrument on the same principle as those above described. Besides the Hodge and Meigs instruments, as we find them in the shops I often use rings made of block-tin softened by the addition of a little lead. These I introduced in 1856. They are made of different sizes, varying from two to three inches in diameter. The material, if tubular, may be a third of an inch in diameter; much less if solid. It matters not whether it be of block-tin or gutta-percha, so it is malleable. Select a ring to suit the capacity of the vagina; compress it gently between the hands till it takes an oval form. It is then in imitation of a Meigs ring, and may be so used; but sometimes it is better to give it the natural curvature of the vagina, after Hodge's plan, by making the distal end *b*, fig. 112,

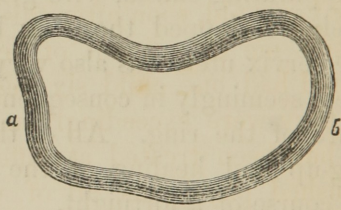

Fig. 112.

pass up behind the neck of the womb, while the proximal end *a* has a slight counter-curvature where it presses the neck of the bladder against the symphysis pubis. Great nicety is necessary in fitting an instrument so as not to injure by pressure the neck of the bladder, the posterior cul-de-sac, or the floor of the vagina, upon which rests the great curvature. It will be difficult to get one instrument with its exact proportions to fit any two cases; and it is often difficult to fit any given case. It has frequently taken me a fortnight, and sometimes much longer, to adjust an instrument

accurately; and sometimes it has been utterly impossible for me to do it at all. When I succeed in fitting the case exactly, *i. e.* in supporting the womb in its normal position without undue pressure on the vaginal parietes, I usually send the model made of this malleable material to the instrument-maker, to be duplicated in vulcanite or silver, if the patient is to leave my care wearing an instrument. The block-tin pessary is quite as good as a silver one; but then the patient in removing and replacing it may spoil its shape, and make it hurtful instead of beneficial. If, however, the patient lives near enough for me to see her occasionally, I seldom order any other instrument than the block-tin one.

As I said before, the case related on p. 266 gave me new views of practical utility, that were not lost; for a lady, twenty-six years old, soon after this came with her husband to consult me on account of her sterility (acquired). She had had one child six years before. It died early, and they were exceedingly anxious for more offspring. She had been treated at different times by several distinguished physicians, all of whom put her through "a course of caustic,"* but her symptoms remained the same, and her sterility persisted. On examination, I found the pelvis deep, the vagina capacious, the perineum relaxed, and the uterus completely retroverted, but not difficult to replace. The posterior wall was, as in all such cases of prolonged malposition, somewhat hypertrophied, and there was also some little engorgement of the posterior lip. Her symptoms of vesical tenesmus, bearing down, &c., were evidently the result of the error of position, and I told them it was

* It was unfortunately the fashion a few years ago in my own country to cauterize the neck of the womb, without reference to conditions or indications.

quite impossible for her to conceive with the uterus in its abnormal position. I concluded to treat the case entirely mechanically, but it was very difficult, for I did not then possess the tact in adapting an instrument to the peculiarities of the case, that observation and enlarged experience can alone give. It took me nearly a month to adjust it so that it could be worn without pain or undue pressure; but once fitted, there was no inconvenience from it; on the contrary, the greatest comfort. The ring, moulded as described, was fully three inches and one-eighth in diameter before giving it the form of a sigmoid parallelogram. A special injunction was that it should be worn during sexual intercourse. Conception occurred in three months. She continued to wear the instrument till after the third month, when the uterus had risen up above the brim of the pelvis, and then it was removed. She was delivered, at full term, of a fine healthy boy, which was turned over to a wet-nurse. She was in hopes that conception would soon occur again, but it did not; and at the end of eighteen months she returned to ask an investigation of her condition, and, if necessary to insure an early conception, the reapplication of the instrument.

I found the uterus precisely as it was when I first saw her. It had no self-adjusting power whatever. It could be replaced with facility, but dropped back as soon as the finger was removed. I gave it as my opinion that conception could hardly occur again with the uterus persistently retroverted. I therefore reapplied the same instrument with injunctions to wear it as before during coition. Conception occurred in eight weeks afterwards. About fifteen months after the birth of the second child, she came again, and I found the uterus precisely as it was at the first consultation.

I adjusted another instrument to prop it up, and gave the same injunctions, and in ten months afterwards she was again a mother.

Now, in this case, I believe that conception could have been brought about as easily five years sooner, if the same treatment had been adopted.

To establish the utility of the pessary during coition, in cases of sterility dependent upon retroversion, I must continue my notes. The case above was uncomplicated. There was simple relaxation of all the pelvic supports of the uterus, and it tilted over backwards, and will remain so always, unless it be propped up mechanically. Occasionally a malposition of this sort is cured by a pregnancy, but often it is not.

In 1856, a lady was brought to the Woman's Hospital, who had been bed-ridden for more than two years. She was thirty-two years old; was married at twenty; gave birth to a child in ten months, but she remained sterile afterwards. She became a widow, and married again at thirty. Twelve months afterwards she ran hurriedly into the garden to bring in some clothes that had been hung out to dry. On reaching up quickly, she felt something suddenly give way in the pelvis; she had great pain, and immediately went to bed, suffering also from nausea, vomiting, and excessive prostration. Her physician was sent for, and attended her for many months, but without much improvement. I found the uterus completely retroverted, and greatly enlarged, with the fundus directed towards the left sacro-iliac symphysis. The enlargement, or rather elongation of the organ, was due to a fibrous tumour growing from the fundus, which explained its diagonal direction, for it was too long to lie retroverted in the median line. To remove the fibrous tumour was

out of the question; to allow the uterus to remain where I found it, was to consign her to her fate without an effort for her relief. My only hope of affording her any permanent benefit was in elevating the uterus, supporting it in position, and giving her the possibility of a conception. When it was so elevated into position, the tumour could be distinctly felt on the fundus, above the promontory of the sacrum. But of course it would fall back into its old position, as soon as the finger and the uterine elevator were removed. By repeating this every day for a week, the uterus became sufficiently tolerant of manipulation to allow the use of an intra-vaginal support. A malleable block-tin ring, about two inches and a half in diameter, was fashioned into the form of a parallelogram, and curved on its long axis, as already described, so as to give it a slight sigmoid flexure. The vagina was rather small, and great care was necessary not to inflict injury by undue pressure in the posterior cul-de-sac, or against the neck of the bladder and the symphysis pubis. The instrument was worn at first for a few hours, but soon it was worn during the whole day, and after a short time she was able to walk. In two or three months she returned home, not cured it is true; but the uterus was elevated into a proper position, and there supported by the simple little contrivance already described. With the hope that conception would take place, she was directed to wear the uterine supporter always during coition. Six months after leaving the Hospital she returned for observation, and was found to be pregnant four months and a half, having conceived in six weeks after returning home. She had worn the instrument all the time except when she removed it for cleaning.

She went the full term and was safely delivered. I

saw her some months after the birth of her child. The uterus was in its proper position, but the tumour was about the same. Without mechanical aid here, I do not see how it would have been possible to have done anything at all for this poor sufferer. There was nothing whatever attempted for her but the replacement of the dislocated uterus, with this vaginal splint, as it were, to support it in its proper relations. This case might be called cured, so far as the mere position of the womb was concerned. It is very probable that the fibrous tumour had existed a long time on the fundus, and that it assisted by its weight when the uterus was suddenly retroverted in holding it down in its abnormal position, and I have as little doubt that the same condition now assists in holding the uterus erect. The pelvis in this case was of ordinary capacity, while in the case previously related it was very deep, with a rather straight sacral promontory.

It might be supposed *à priori* that any instrument in the vagina would interfere with coition. I usually make it a rule to explain the necessity of the treatment to the husband as well as the wife. So far as our sex is concerned, the knowledge of the presence of a vaginal support might be an unpoetical association; but if it is properly adjusted, it is not at all in the way. Sometimes the wife has insisted that it was not necessary for the husband to know that the uterus was thus artificially braced up. The instrument should be neither too large nor too small, and should fit snugly up behind the symphysis pubis.

In 1861 I was consulted by a young widow, who had a proposition of marriage. During her first marriage she had had one full term labour, and three or four miscarriages at about the third month. Her physicians told

her that she would probably always miscarry at the third month. It was her opinion that few men would marry if they did not expect to be blessed with off spring, and she herself looked upon children as necessary to the complete happiness of married life. With these views she was unwilling to marry unless she could have some assurance that the habit of aborting could be broken up; and upon this point my opinion was asked. I found the uterus completely retroverted, with some enlargement of the posterior wall from long error of position. I explained to her that her miscarriages were almost certainly due to the retroversion; that conception would in all probability occur with her, and that the pregnancy would go to its full term, provided the uterus was kept in its normal position, till it got large enough to rise above the brim of the pelvis. On this assurance the offer of marriage was accepted; and in two months my patient was ready for its fulfilment.

Having adjusted an instrument to hold the uterus in proper position, and having instructed her in its management, the wedding day was fixed at the time she expected to finish the menstrual period. The marriage took place early in January, on the very day of the cessation of the flow. The happy couple immediately left for New Orleans, and in a month afterwards I received a note from my patient saying she was undoubtedly pregnant.

As she did not wish to consult any other physician, and as I was exceedingly anxious for her to pass the third month without a miscarriage, I directed her to wear the instrument till she quickened, and then to remove it. At the full term she was safely delivered.

Now here was a case in which the husband had no idea that there had ever been any uterine disease or any

mechanical treatment, and does not know it to this day. The case is valuable as showing the protective power of a normal position against the dangers of abortion. There is no more common cause of abortion than retroversion, if we except imprudent and excessive coition, and for the simplest of all reasons. A retroverted womb is impregnated; impregnation only aggravates the malposition; the uterus and its contents grow apace till it is jammed with the fundus under the promontory of the sacrum, from which it has no natural tendency to escape. When it gets to the third month, it must either rise above the brim of the pelvis, or throw off its contents. If it fail to do the one, the other generally takes place. If we do not detect the malposition, and rectify it in time, a miscarriage is the almost inevitable result. I am sure I have often prevented miscarriage by rectifying a retroverted uterus.

Here is an example. A lady, twenty-eight years old, had had two labours at full term. Afterwards she had a miscarriage at the third month. She subsequently became pregnant, and at the end of two months and a half she was again violently threatened with all the symptoms of a speedy miscarriage. I found the uterus retroverted, with the cervix against the pubes, and the fundus jammed under the sacral promontory. The uterus was gently replaced, and a Meigs ring three inches in diameter was introduced to hold it in its proper position. The rectification of the malposition was immediately followed by a relief of all uterine symptoms. The instrument was worn for a month, being changed every three or four days. She went the full time, and was safely delivered. This case serves very well as an illustration of a principle, and as an example of its class.

The cases already narrated as exhibiting the influence

of the pessary in facilitating conception, and, therefore, in curing the malposition, were such as had conceived previously. But I have frequently seen the same thing in the naturally sterile. In 1858 Dr. Silas D. Scudder, then house-physician at the Woman's Hospital, found amongst the out-door patients a woman married ten years without issue, who was very desirous of offspring. She had retroversion, but what the complications were, if any, I do not know. However he fitted a malleable block-tin ring to the vagina, and she conceived in two months afterwards. He allowed her to wear the instrument long enough to guard against a miscarriage (three months), and she went the full term.

In 1857 a lady from the South consulted me in reference to her sterility. She had been married fifteen years without conceiving. Her beautiful physique and fine general health were all that could be desired; but she had painful menstruation. The uterus was retroverted, and she had a fibrous tumour, as large as an English walnut, in the posterior wall, while the os was contracted and the cervix indurated.

The uterine sound, sponge tent, and bi-manual palpation, showed that the enlargement *a* (fig. 113) was

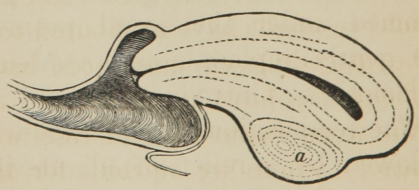

Fig. 113.

a distinct tumour, and not a mere hypertrophy of tissue, as we so often see in old retroversions. The indications

were the same as if there had been no fibroid tumour; viz., to enlarge the os and cervix by incision, and then to adjust an instrument to hold the uterus *in situ* during coition. From the contraction of the os and the induration of the cervix, I was satisfied that the case would have been sterile even with a normal position of the uterus. Besides, given a perfect state of the os and cervix, the malposition would militate against the probabilities of conception. Therefore the os and cervix were divided bilaterally in April, 1857. The ring was fitted after the next menstruation in May, and in August she conceived; but unfortunately a fall, three months afterwards, in November, produced a miscarriage; and she had another miscarriage in June, 1858, at about the third month. This, too, was associated with an accidental fall. It was accompanied by great loss of blood, and followed by a serious metritic inflammation, from which she did not recover for several weeks, during which time she was carefully attended by Dr. Griscom, of New York. As soon as she was able to leave the city, we sent her to Saratoga to recuperate, and she returned to New York in November, her general health being again very good. It was now eighteen months since we began to treat her case. She had had two miscarriages, which we might have attributed to the fibroid tumour, if the attending circumstances had not each time been sufficient to have produced the unfortunate result. But the worst feature of the case was that we were now precisely where we started, for the metritic inflammation following the last miscarriage had reproduced the contracted puckered condition of the os, which now looked as if it had never been subjected to a surgical operation; while the cervix felt, perhaps, more gristly than before. What was to be done? We were

all in a hurry for another conception. Her husband could not remain much longer away from home. I proposed to repeat the operation of incising the os and cervix, to which, like a true woman, she at once assented, and it was done after the next menstruation. In a few weeks (January, 1859), she was pronounced fit for the married life. The os was open, and the uterus held erect by a well-adjusted instrument, which, as before, she was directed to wear during coition. Conception fortunately occurred just after the next menstruation, and we watched her most carefully during the whole period of utero-gestation. She wore the instrument nearly up to the time of quickening, when it was removed altogether. She now acknowledged to having removed it as soon as she found out she was pregnant, each time before, which doubtless had much to do with the miscarriages that followed the falls. She went safely the full term, and was delivered by Dr. Griscom, of a son, on the 1st December, 1859.

We kept this patient in the horizontal position for five or six weeks after confinement, with the hope that a perfect involution would be effected before she resumed the erect posture, and that the uterus might stand a good chance of remaining in its proper position afterwards without instrumental aid. When she left for the South, two months after her delivery, the uterus remained in a normal position; but the best evidence of a perfect cure having been effected, is afforded by the fact that fifteen months after her confinement in New York, she was safely delivered of twins at her home in the South.

This case is interesting in many particulars:—

1st. It shows, what has been observed by others, and what I have seen many times before and since,

that a fibroid tumour does not necessarily impede conception, gestation, or delivery, all other things being equal.

2nd. It shows that it is possible, even in very difficult cases, to understand the obstacles to conception, and to remove them by persistent continued effort, if our patient has sufficient fortitude and endurance.

3rd. It shows that it is possible to cure a retroversion, and even to cause the disappearance of a fibroid by the modified nutrition of utero-gestation.

I am aware that this reiteration of cases is irksome; but, as I have said before, I write mainly for the young and inexperienced; and how am I to impress upon their minds the truth of my views but by giving them the facts and circumstances that have gradually led my own convictions where I myself find them, without any prejudices or preconceived opinions on the subject?

I could here detail many, very many cases like those already related; but enough has been said, and I leave this part of the subject with the simple statement of the above facts, which strike me as having an important bearing on the subject under consideration.

It might be supposed from what I have said about pessaries, that every case of retroversion is capable of being rectified by an instrument. If so, let me hasten to correct the error. I am sorry to say that there are numbers of cases in which a pessary is absolutely out of the question. In many women the vagina is so delicately organized that it is perfectly intolerant of any hard substance, and in a few, about the time of change of life, it will not bear the presence of a soft sponge, or even a bit of cotton. In some there is a chronic metritis, which forbids mechanical means; and in

others peri-uterine inflammation or a prolapsed inflamed ovary.

We occasionally find a retroversion conjoined with an anteflexion. When this is the case, the infra-vaginal cervix is almost always too long; and we often find the supra-vaginal portion indurated, tender, and very sensitive, just above the insertion of the posterior wall of the vagina. In such cases it will be impossible for the patient to wear a pessary, on account of its pressure behind the cervix. I have not as yet amputated a cervix under these circumstances, but I am very sure that it would be better to do this, if we wish to treat the sterile condition successfully. I have been in the habit latterly of managing these obstinate cases simply by introducing a plug of fine cotton, or, as it is called in England, cotton-wool. I have alluded to this before, p. 245.

A pessary of cotton can be worn with great comfort if the vagina itself is in a normal condition. In preparing it, we must be careful not to pull the cotton in pieces, but let it be one compact mass of the desired size, carefully tied in the middle with a strong thread for its ready removal. We may use it simply so, or medicated with glycerine or tannin, or anything else we may wish. If it is unmedicated, it must not be worn longer than twenty-four hours. It is enough to wear it while awake. If we use glycerine, we may leave this tampon pessary two or three days, or till it falls out. The glycerine is disinfectant, and the cotton remains without odour. It is important for the convenience and comfort of the patient, to teach her to apply and remove the cotton pessary herself. For this purpose I have invented a porte-tampon, which answers a most admirable purpose.

Fig. 114 represents the porte-tampon. The requisite quantity of cotton, tied in the middle with a strong thread some eight or ten inches long, is placed in the porte-tampon; the lid is shut; the instrument is introduced like an ordinary speculum, the patient on the back; it is to be pushed firmly and forcibly backwards and downwards under the cervix to the posterior cul-de-sac. When we are satisfied that it can go no further without producing pain, then the piston is to be pushed forwards; the tampon is left in its place, and the instrument is withdrawn. The string previously attached to the cotton, hangs from the vagina, and with this the tampon is removed when necessary. One, and almost the only objection to the cotton nowadays, is its expensiveness. Tow is much cheaper, and answers tolerably well. I have had many patients who could not remain long enough under treatment to be radically cured of engorgements, &c., who have gone away with a porte-tampon and appropriate remedies, using it themselves, and getting well without further aid. I have had a few who suffered from hæmorrhages that demanded the tampon, and who were able to control these by applying it themselves by means of this instrument. Of course they had to charge the porte-tampon four, five, or six times, fixing a string to each bit of cotton. I only recommend this where the patient is far

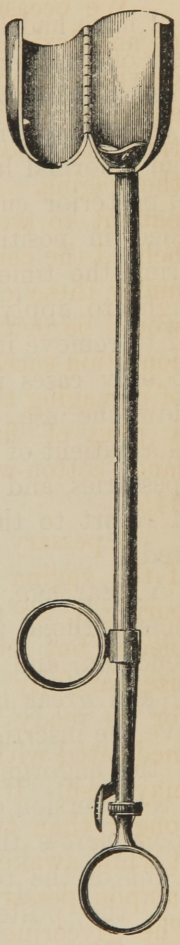

Fig. 114.

removed from prompt medical aid, and where even a small loss of blood is to be carefully avoided.

I have had lately under my care two most obstinate cases of retroversion in which no sort of pessary could be worn except cotton; without the cotton pessary, the uterus in each was turned back to an angle of more than 100° from a normal line, but with this pushed snugly up into the posterior cul-de-sac, the organ was comfortably sustained in position. Each of these patients conceived during the time of using this instrument. They were taught to apply the tampon on rising in the morning, and to remove it on going to bed at night. These are the only cases in which as yet I have seen pregnancy follow the use of this sort of pessary. One of them was a patient of Sir Joseph Olliffe. We tried a variety of pessaries, and were compelled to give up all of them, and resort to the cotton pessary, and the result was as stated.

A year ago, I incised the cervix uteri in a case of dysmenorrhœa where there was a retroversion, with anteflexion, and elongation of the cervix, with induration and great tenderness of its posterior portion, just above the insertion of the vagina. The dysmenorrhœa and the engorgement of the organ were relieved; but the retroversion continued, with its attendant symptoms of pain across the hips, dragging sensations, &c. On account of the tenderness of the cervix when pressed above the posterior cul-de-sac, it was impossible for her to wear any of the instruments that I am in the habit of using. But she could wear a small tampon of cotton with the greatest comfort. She writes: "The uterine support has, I am sure, done great things for me. I now use it about every other day: last month every day. My idea is that it has quite succeeded in

its purpose, and that I am as well as any one need be.

Sometimes the broad, flat porte-tampon above figured is difficult of introduction, even in those who have borne children; and then I have been compelled to resort to one made after this fashion (fig. 115). The cotton, which must be properly prepared, is to be pushed in at the open end of the instrument, and this is to be applied as before directed.

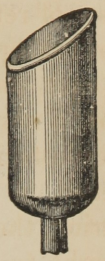

Fig. 115.

Of Procidentia.—Whenever the cervix uteri passes through the mouth of the vagina, we call it a procidentia, whether it be to a slight or a great extent. Thus a procidentia may be complete or incomplete: complete, when the vagina is inverted and protruded externally; incomplete, when the cervix uteri alone passes down without bringing the vagina with it. It is only occasionally that we see the cervix alone projecting between the labia for an inch or two, and remaining thus stationary for a long time; usually it goes from bad to worse, till it eventually passes entirely through the vulva, forming a tumour of great size, which, at its most dependent part, presents the os tincæ often ulcerated and bleeding. This tumour is a veritable hernial mass, consisting sometimes of the whole uterus, but oftener of its elongated cervix, the *bas fond* of the bladder, and occasionally intestine, with the inverted vagina as its outer covering.

Fig. 116 represents an incomplete procidentia, and is a type of its class. – See Dr. Bennet's case, on p. 220.

Fig. 124, p. 305, represents a complete procidentia, and may be taken as a type of its class.

Several separate and independent conditions must conspire to produce a result so opposed to the designs of nature. Thus there must always be a broad pubic arch with very divergent rami and a relaxed perineum; and then the axis of the uterus must be turned back in a line with that of the vagina and the pelvic outlet; in other words, there must be a retroversion. With the uterus anteverted, a procidentia is utterly impossible, be the attendant circumstances what they may. Occasionally we see it as a result of the abnormal pressure

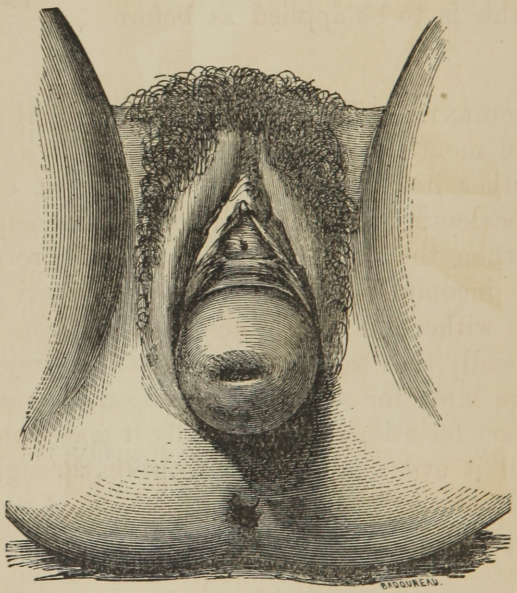

Fig. 116.

of an irregular mass of fibroid tumours, which fill the pelvis and crowd the uterus down; but not even then without the co-operating conditions above cited.

In very old cases of procidentia, the vagina, from long exposure to the air, becomes dry, and assumes

almost a dermoid appearance. It is the opinion of many, that the cervix uteri is the first in the order of exit, that it always comes down, to open like a wedge the parts through which the whole mass descends. I cannot say that this is not so at first, but I can with the greatest confidence say that it is not so in the great majority of cases, when they become chronic.

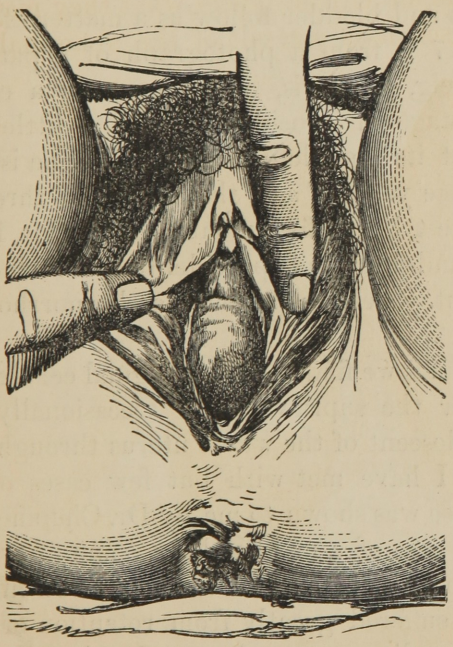

Fig. 117.

In an old procidentia, the vagina attains enormous proportions, in consequence of its being constantly expanded by the distending power of its hernial contents. To observe the order of descent in a case like this, reduce the parts to their normal relations, and let the patient force them out again, whether in the erect

posture or on the back, and we shall see the anterior wall of the vagina, first forced downwards against the perineum, in the form of a cystocele; a slight straining pushes this beyond the vulva, and the cervix follows immediately, bringing down the posterior wall of the vagina. If we would reduce a procidentia with ease, we must invert this order; push back the posterior cul-de-sac first; then the cervix; and then the anterior wall of the vagina and bladder follow as a matter of course.

Fig. 117 is from a photograph of a patient of Dr. Thierry-Meig, in Paris, and represents a cystocele as the first stage of procidentia. By a little effort she could effect its complete protrusion. She is a German, twenty-three years of age, the mother of three children, the youngest being five months old. She is a street-sweeper, and has had procidentia ever since her last confinement. Besides this she has hæmorrhoids, as seen in the cut.

Sometimes we find the intra-vaginal cervix elongated, but oftener the supra-vaginal. Occasionally we see a complete descent of the whole uterus through the vulva. However, I have met with but few cases of this sort. One of these was shown to me by Dr. Chepmell, of Paris. It was the case of a maiden lady, some forty years old, who had been subject to it for twelve or fifteen years, and often suffered greatly from retention of urine, and the other ordinary attendants of this affection. The doctor tells me that he has repeatedly found the procidentia girdled by an ulcerated sulcus at its neck, and seemingly bordering upon the verge of sphacelus, in consequence of its obstructed circulation. Its great peculiarity consisted in the fact that the uterus was but one inch and a half deep. Many eminent medical men had seen the case before, and were of opinion that the

utero-cervical canal was obstructed at this depth by some mechanical barrier that prevented the further passage of the probe; but we were able to settle this point very easily, by palpation alone, while the uterus was in the pelvis; and when it came down, it passed entirely through the vulva, and we could easily grasp it between the two hands, by passing the index-finger of one hand into the rectum, and hooking it forwards over the fundus, while pressure was made by the other on the front of the tumour, just below the urethra. Indeed we could even tilt the fundus downwards and backwards across the long axis of the procidentia; and this movement gave us great facility in diagnosing the contents of this great hernial protrusion, which consisted of intestine as well as of uterus and bladder. In this case the vagina was immense, the perineum greatly relaxed, and the pubic rami unusually divergent.

But while we only occasionally find a procidentia thus associated with a uterus, under or even of normal size, we often find it where there is hypertrophy of some part of this organ. For instance, there may be hypertrophy of the cervix, or merely elongation of its intra-vaginal portion, or of the supra-vaginal portion; if the former, the body of the uterus may be of normal proportions; if the latter, it is more apt to be hypertrophied. And sometimes the cervix is elongated in its two segments, both infra and supra-vaginal.

In these cases of cervical elongation, we often find the utero-cervical canal four and five inches deep; the supra-vaginal portion of the cervix being slender, attenuated, and, when examined per rectum, feeling not larger than the finger. This elongation is evidently secondary. I believe it to be a sequence of the procidentia, for we are more apt to find supra-vaginal elongation where the

fundus uteri is from some cause or other too large to pass out of the pelvis. If the body of the uterus passes out of the pelvis, there is no supra-vaginal elongation; if not, there is; and for the simplest reason. Suppose the cervix uteri projecting through the vulva, the fundus, from some cause, cannot follow, but remains fixed, as it were, within the pelvis by hypertrophic or fibroid enlargement; the cervix once through the vulva, pressure around it from above soon pushes down the two culs-de-sac, resulting in a *de facto* hernia. This gets larger and larger, and the uterus retained in the pelvic cavity becomes one of the principal points of support for this mass, which hangs by the cervix, and the cervix consequently becomes not hypertrophied but attenuated and elongated, feeling like a mere cord, not more than half its normal size. And this elongation is gradually produced by these two antagonistic forces; one acting on the body of the uterus to retain it in the pelvic cavity, the other on the lower end of the cervix, to push it downwards.

When the procidentia is due to a mass of tumours filling the pelvic cavity, and crowding the uterus downwards, as I have seen in several instances, we cannot, I regret to say, promise much relief.

Fig. 118 represents a procidentia of more than twenty years' standing, in a woman nearly seventy years of age, whose pelvis was filled with a number of small fibroids of bony hardness. One large tumour is not so apt to produce procidentia as several smaller ones, say from the size of an orange to that of the fist, loosely bound together; because the single one may grow large enough to rise above and rest upon the brim of the pelvis, while the smaller ones accommodate themselves to the pelvic cavity, displacing what-

ever may interfere with their development. The above was the largest hernial procidentia I have ever seen. It reached nearly half-way down the thighs, and contained a large quantity of intestine. When it was reduced she felt less comfortable than when it protruded. On this account no effort was made for its relief.

Huguier has written extensively on procidentia

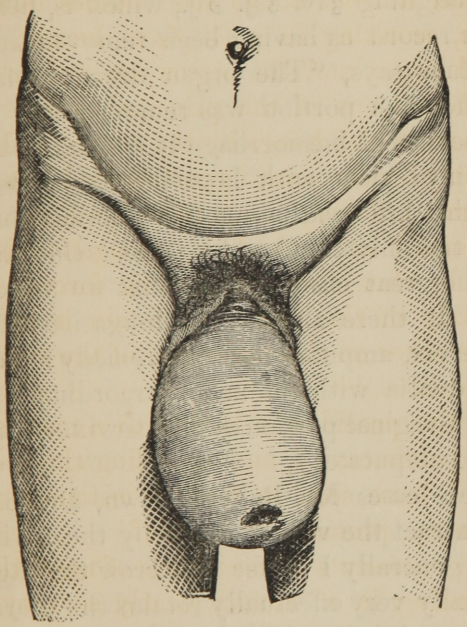

Fig. 118.

uteri, and I believe he was the first to point out the distinctive characteristics of its anatomical peculiarities. He found elongation of the cervix in all cases, either above or below the insertion of the vagina; and he suggested and performed amputation of the neck of the uterus in every case, and with great success. For

special information in regard to his views, I must refer the reader to his memoir.*

I amputate the cervix only when its lower segment is too large or too long, and projects so far into the vagina as to present a mechanical obstacle to the retention of the uterus *in situ* when replaced. This will be sufficient in some cases, such as that met with by Dr. A. K. Gardner, of New York, who amputated a cervix weighing ʒiv. ʒij. ɔij., which is, perhaps, "the largest on record as having been removed during life."† Dr. Gardner says, "The organ drew up far into the vagina after the portion was removed, and in order to arrest a persistent hæmorrhage it was necessary to draw it down into view with hooks." Of course all such cases as this are readily cured by amputation, and, as a rule, it is the only thing to be done. But this is not a type of the great class of cases that we are called upon to treat. If there should be elongation of the infra-vaginal cervix, amputation is the remedy; but we often find procidentia without any extraordinary elongation of the infra-vaginal portion of the cervix. There is then nothing to amputate.

In these cases Mr. Baker Brown, Dr. Savage, and others, contract the vulvar outlet by the perineal operation; but generally I prefer to narrow the vagina above, which usually very effectually retains the uterus in something like a normal position within the pelvis.

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* "Mémoire sur les Allongements hypertrophiques du Col de l'Utérus dans les Affections désignées sous les noms de Descente, de Précipitation de cet Organe, et sur leur traitement par la résection, ou l amputation de la totalité du Col, suivant la variété de la Maladie." Par P. C. Huguier, Membre de l'Académie Impériale de Médecine, &c. Paris: J. B. Baillière et Fils. 1860.

† "Amputation of the Cervix Uteri." By A. K. Gardner, M.D., Prof., &c. &c.

The idea of narrowing the vagina is by no means new. I suppose we may justly claim it for the great Marshall Hall. However I do not think the operation ever succeeded till my own day,—and this success is due wholly to metallic sutures.

I propose now to give a brief sketch of the steps by which we arrived at the method of operating herein advocated.

In 1856, Dr. Warren Stone and Dr. Axson, of New Orleans, referred a patient of theirs to my care, who had had procidentia for three years. She was about thirty years of age, tall, slender, and bony, and had enjoyed good health till the yellow-fever epidemic of 1853, in New Orleans. The labour, lifting, and fatigue which she underwent as a nurse during that terrible epidemic left her with a double inguinal hernia and a complete procidentia uteri. I have seldom seen a more distressing case. She wore a double truss for the hernial protrusions; and, for the procidentia, the largest globe-pessary that I ever saw. But notwithstanding the immense size of the globe, which was nine inches in circumference, it was impossible for her to retain it in the vagina by any bandage; so it was constantly slipping away, and that too at rather inopportune moments. I arranged a pessary with a stem and a T bandage, which kept the parts within the pelvis. In the course of two months she had regained some 25 pounds of flesh, and was on the eve of returning home harnessed up with trusses and bandages to a most uncomfortable degree, when I happened to ask her if she would be willing to submit to a surgical operation, if we could promise to get rid of the pessary and its bandage. She promptly replied, "Yes."

Previously to this we had been in the habit of per-

forming the perineal operation after the plan of Mr. Baker Brown, and for some reason we had not been successful. Dr. Emmet and myself both thought that we could hardly promise any better success by it in this case than we had formerly met with. This was the first time that I had had a good opportunity of observing and studying the manner in which the procidentia occurred. After replacing it and allowing it to descend again, which always occurred very quickly on assuming the erect posture, I noticed, as before described, that the descent was not at first by the protrusion of the cervix uteri, but invariably by a prolapse of the anterior wall of the vagina, which always preceded the cervix, and drew down the uterus. I found that this cystocele was but another hernia (she had double inguinal hernia), and I discovered that she could not force it down again, when simply the point of the index finger was held in the anterior cul-de-sac. Then by pinching up the anterior wall of the vagina into a longitudinal fold, with two tenacula or a pair of forceps, I saw that the parts had no tendency whatever to come down; and that it was impossible for our patient to force them down if we thus prevented the anterior wall of the vagina from descending. Hence the idea of wholly removing the redundant portion of the anterior wall of the vagina occurred to me; but it did not occur to me to operate simply by removing strips of vaginal mucous membrane. I seriously proposed to this lady to make a complete vesico-vaginal fistula, by removing at once, as it were, a large portion of the base of the bladder with the anterior wall of the vagina. She agreed to it; and I laid the plan of operating before the Consulting Board of the Hospital, and it was adopted. The vagina and its outlet were enormous. When the patient was placed on the knees,

or on the left side, with the perineum elevated by the speculum, it presented about the relative proportion shown in fig. 119. The measurements made repeatedly by Dr. Emmet and myself, gave the following propor-

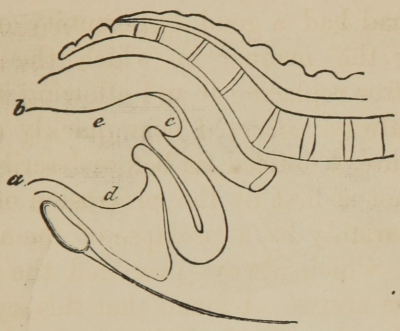

Fig. 119.

tions. From the meatus urinarius to the perineum, *a* to *b*, when this was pulled back by the speculum, was three inches; from the meatus urinarius to the posterior cul-de-sac, *a* to *c*, five inches and a quarter; broadest transverse diameter, four inches and a quarter; broadest antero-posterior, *d* to *e*, three inches and a half.

Proposing to excise the anterior wall of the vagina, I hooked it up with a tenaculum at *d*, pulled it well towards the posterior wall, *e*, and then grasped the base of the mass thus elevated with a pair of curved forceps made for the purpose, on the principle of Ricord's phymosis forceps, which held the parts firmly embraced, while with scissors cutting under the forceps I removed, at once, a very large portion of the anterior wall of the vagina. The portion removed measured two inches and a half transversely, by two inches and five-eighths longitudinally, and was very thick. The chasm made by this operation was fearful; the lateral retraction of the

divided edges being so great as to present at a superficial glance some difficulty in bringing them together by sutures. There was, however, no trouble whatever.

Fig. 120 would represent a side view of one blade,

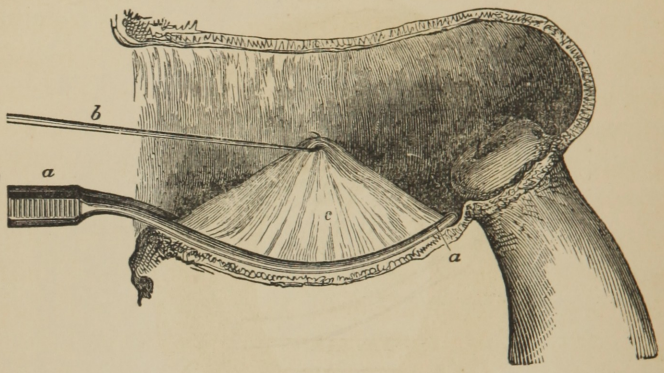

Fig. 120.

a, of the forceps, as it grasped the portion *c*, to be removed. The bleeding was not profuse; but I at once rapidly filled the chasm with cotton, to stop the hæmorrhage by pressure. A few minutes sufficed for this; and then the tampon was removed for the purpose of closing the edges of the opening by transverse sutures. My surprise was equalled only by my delight, when I found that I had not succeeded in doing what I intended; for instead of excising the base of the bladder with the anterior wall of the vagina, I had, by the tenaculum, simply raised the hypertrophied vaginal tissue up between the blades of the forceps, luckily separating it from the lining membrane of the bladder, which remained intact. Thus by a mere accident, the operation was really far better than if I had succeeded in accomplishing what theoretically I proposed to do.

Fig. 121 would represent about the relative proportion of vaginal tissue here removed. The lateral edges

were brought together longitudinally by seven or eight silver sutures passed transversely, as represented in the diagram. She was soon well, and is so to this day. The operation was done nine years ago. The good

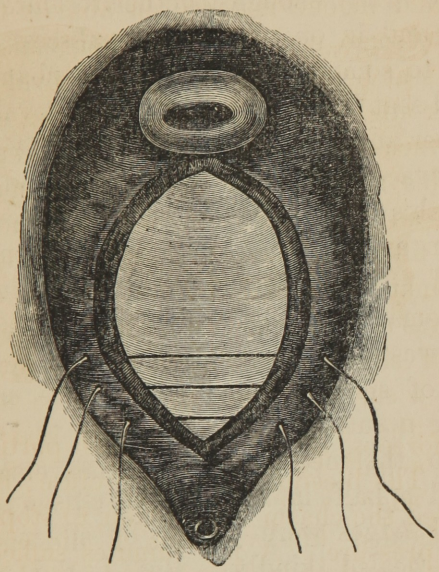

Fig. 121.

result in this case led me to operate on others afterwards, by a simple denudation of the vaginal epithelium to the same extent as shown above. One great objection to this method was, that the necessarily tedious scarification permitted the loss of too much blood; another was the danger of an abscess forming in consequence of the central part of the scarified portion not being closely embraced by the sutures. For instance, it will be seen by reference to the diagram, that when the sutures were closed, bringing the outer edges into apposition, the central portion of denuded tissue not included by them would necessarily be thrown into a

fold that would project the mucous membrane of the bladder into a sort of longitudinal ridge along the *bas fond.* I was at first afraid that this loose tissue might not be held firmly enough together to unite by the first intention; and in one instance an abscess formed that gave rise to some constitutional disturbance. But its nature and seat being detected, the removal of a suture at the upper angle of the wound, near the cervix uteri, promptly evacuated the matter, and relieved all suffering. However, this method of operating was continued till 1858, when an elderly woman, with an enormous procidentia of fifteen or twenty years' standing, was sent to the Woman's Hospital, by Dr. Duane, of Schenectady. It was a very bad case indeed. I operated by the plan of simple denudation of the mucous membrane over a surface extending from the neck of the bladder to the neck of the uterus, and being two inches and a half in its largest transverse diameter; the lateral edges were united by silver sutures, and the parts healed kindly. But I did not remove tissue enough, and there was a considerable cystocele left. I felt pretty sure that the original trouble would be reproduced, unless she should wear constantly some sort of a pessary. Accordingly I fitted one, and sent her home in a very comfortable condition. I was quite satisfied, and so was my patient; but when she got home, the physician who had had charge of her case before she consulted Dr. Duane, ridiculed the idea of her being cured by a surgical operation, if it were necessary for her still to wear an instrument afterwards. Although she was perfectly comfortable, she returned in two or three months, and asked to be readmitted to the Hospital. She said she wished simply to prove to her physician at home that she could be cured by an

operation, so as not to be compelled to wear a pessary. Her pluck challenged my inventive faculties, and then it was that I devised another method of operating. For instance, instead of the broad scarification of the anterior wall of the vagina, as before, I simply removed the mucous membrane in the form of a V (fig. 122, *a b*), the apex being near the neck of the bladder, and

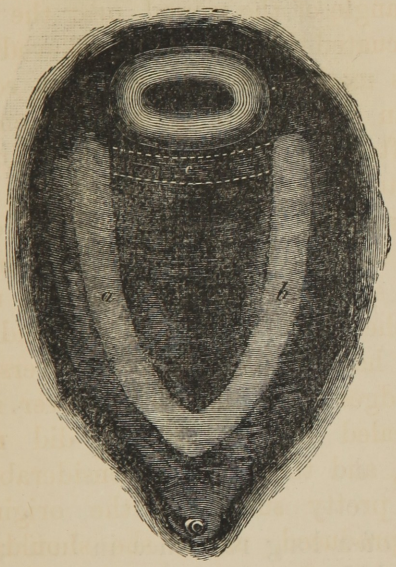

FIG. 122.

the two arms extending up on the sides of the cervix uteri. These two denuded surfaces were brought together by silver sutures passed transversely, thus making a longitudinal fold narrowing the vagina and crowding the cervix backwards. This simple operation was thus repeatedly performed, and always successfully, by Dr. Emmet and myself, at the Woman's Hospital, from 1858 to 1862, when I left New York.

In Paris I had occasion to perform it for Sir Joseph

Olliffe on an old lady sixty-five years of age, who had had procidentia for twenty years. The parts united; the uterus was held in its place, and she returned home in a fortnight. Her general health was very feeble, in

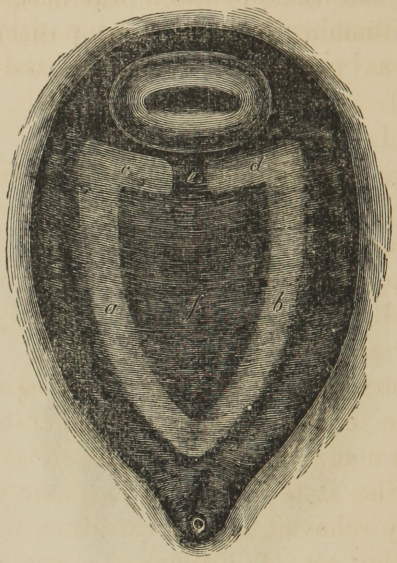

Fig. 123.

consequence of a long residence in India; and in two months the whole cicatrix gradually gave way, and the procidentia was reproduced. This was the first and only case of failure that I had ever seen after this method. The operation was subsequently repeated; but this time, instead of a V-shaped scarification, it was made in the form of a trowel, as represented in fig. 123, the point presenting below, the shoulders above in the anterior cul-de-sac. The denuded surfaces *a c* and *b d* were brought together by transverse silver sutures. A small portion of tissue was left undenuded at *e*, between *c* and *d*, for the purpose of permitting the escape of

any secretions naturally forming in the shut pouch *f*.

Although she is an opium-eater, and frequently has attacks of diarrhœa, in consequence of its inordinate use, as we often see, the operation was successful, and the uterus still remains in its normal position. This last operation was performed with the assistance of Sir Joseph Olliffe and Dr. Johnston, of Paris, and Professor Pope, of St. Louis.

Dr. Emmet* has recently called attention to a source of trouble when the operation is performed by a simple V-shaped denudation, as shown in fig. 122. He says, "Previous to the time of Dr. Sims's removal to Europe in 1862, we both had operated frequently without the necessity for any modification occurring.

"In September, 1862, after three months of great suffering, one of the first patients operated on by Dr. Sims in this manner, presented herself at the Hospital, for relief. She stated that, during four years, she had been entirely relieved by the operation, when, suddenly (while in the act of lifting) she was seized with a persistent tenesmus, greatly aggravated in the upright position.

"On examination, the line of union was found perfect, with no prolapse of the vaginal wall. But the neck of the uterus had slipped behind the septum into the pouch, thus throwing the fundus into the hollow of the sacrum, and fixing the organ in this position. With great difficulty, the neck was disengaged. On returning the uterus to its normal position, immediate relief was

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* *New York Medical Journal*, vol. i., No. I. April, 1865. "A Radical Operation for Procidentia Uteri." By Thomas Addis Emmet, M.D., Surgeon to the Woman's Hospital.

obtained, and she was discharged without further treatment." This case was subsequently operated upon by Dr. Emmet.

After this, Dr. Emmet hunted up two patients upon whom he had operated eighteen months before, and he found the uterus retroverted in each one, with the cervix resting behind the pouch made by bringing together the two denuded surfaces *a b*, fig. 122. To remedy this defect, in his subsequent operations he simply denuded the vaginal mucous membrane in a line across the cul-de-sac between these two points, as shown by the dotted line *c*, fig. 122, making a regular triangle with its apex at the neck of the bladder, and base at the cervix uteri. In January, 1864, Dr. Emmet operated on a very unruly patient, who, during the night after the operation, "got up and walked about the ward for several hours, and continued, in spite of all remonstrance, to follow her own inclination. On the twelfth day, it was discovered that four sutures (near the neck of the bladder) had torn out, and through the gap a portion of the relaxed base of the bladder protruded. The sutures were all removed at the time, and every hope of success abandoned. Before her discharge, it was found on examination that the entire line of union had gradually parted, with the exception of the cross scarification, in front of the cervix uteri. The fold thus formed (as in a sling) had retained the organ perfectly in place, although below, a cystocele existed. Future experience must demonstrate how far the formation of this fold can alone be relied on under other circumstances; yet it is evident that in many cases this will prove all that is necessary to retain the uterus *in situ*."

It is always interesting to watch the slow degrees by which true principles of treatment are established. The

idea of narrowing the vagina for the cure of procidentia was first suggested by Marshall Hall, but I do not know that the operation ever succeeded. Then I carried out the principle by cutting away the whole of the redun-

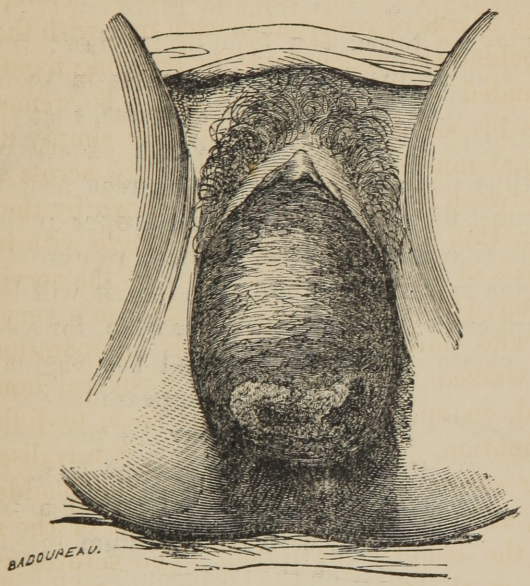

Fig. 124.

dant portion of the anterior wall of the vagina (fig. 120). This I afterwards modified by simply denuding a large oval surface on the anterior wall, and uniting its lateral edges by silver sutures. This was further modified by making a **V**-shaped scarification (fig. 122), and producing a veritable fold in the wall of the vagina. Then I made the **V** trowel-shaped, by turning its upper ends inwards across the axis of the vagina, in Sir Joseph Olliffe's case, fig. 123. Then Dr. Emmet made this a complete triangle, and eventually an accident showed him that merely a narrowing of the vagina just

at the anterior cul-de-sac, at least in one case, answers every purpose of holding the uterus in its place.

The mechanical execution of this operation is a matter of some nicety, but it is by no means difficult. Suppose we have such a case as the one represented in fig. 124, which may be taken as a type of its class; we wish to narrow the vagina to keep the parts in their normal relations. We would suppose, *à priori*, that the operation could be done more easily and exactly with the uterus thus protruded; but it is a great mistake. The uterus must first be restored to its proper position, and if the os tincæ is ulcerated, as here represented, or if the vagina is dry, scaly, and skin-like, it will be well to apply glycerine on a tampon of cotton, for a few days, till the ulcerations are healed and the vagina assumes more of a normal appearance; after which the operation may be performed. For this purpose, the patient is to be placed on the left side, as so often before described, with my speculum introduced to pull back the perineum and posterior wall of the vagina. We can then get an accurate idea of the dimensions of the over-distended vagina, and with a small tenaculum hooked into the mucous membrane on each side of the middle line of the anterior wall, we can approximate these surfaces, and thus determine whether we should make the denudation of tissue to a greater or less extent on either side. There was at first some little trouble in making the two arms of the V equilateral; sometimes one would diverge a little more from the median line on one side than the other;

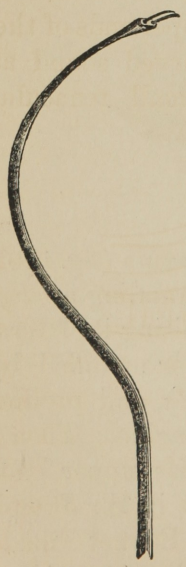

Fig. 125.

but this was overcome by using an ordinary malleable uterine sound curved as represented in fig. 125. Its convexity rests centrally along the middle line of the anterior wall, the distal end pushes back the cervix uteri, while the counter-curvature lies in contact with the urethra. By thus pushing the neck of the uterus back in a straight line, while the anterior wall is depressed centrally, the curvature of the sound is hidden from view by the lateral folds of the vagina, which fall over it and meet in the middle line, showing us exactly where the tissue is to be removed for the purpose of uniting the parts that thus so naturally and easily come together. With the parts thus held, it is very easy to denude two surfaces a third of an inch wide or more, extending, seemingly, almost in parallel lines from the neck of the bladder upon each side of the cervix uteri. To make the transverse line of denudation join the upper ends of these two arms of the V, we remove the curved sound and pull the cervix downwards with a small tenaculum.

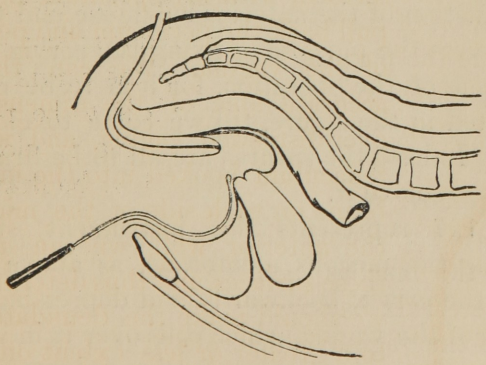

Fig. 126.

We must be careful not to make the arms of the V too divergent, and at the same time we must avoid running

them too closely together. They should, when united by sutures, relieve the cystocele without putting the parts too much on the stretch. The sutures are, of course, to be passed transversely, beginning below, as represented in fig. 121. The sound is to be retained, pushing the uterus backwards till we come to pass those near the cervix uteri. These should be made to embrace all the denuded tissue, *c d*, excluding the undenuded portion *e* (fig. 123). I think it very important to leave a drain here, as before said, for the discharge of the normal secretions of the pouch *f*.

Fig. 126 represents the speculum in position, and the curved sound pushing back the cervix and depressing the anterior wall of the vagina.

Dr. Emmet bends the end of the sound into the form of a ring, to fit around the cervix uteri. Sir Joseph Olliffe suggested the same thing to me when I operated on his case in Paris, but instead of this I have had simply a little tenaculum fork at the end of the instrument (fig. 125), to be hooked into the mucous membrane, just at the junction of the anterior cul-de-sac and the vagina. This answers the purpose of fixing the cervix during the whole time of the operation, for it is to be retained, as represented in the figure, till we come to close up the sutures. Indeed, the sutures are all to be drawn closely before we remove it.

Fig. 127 represents the instrument superficially transfixing the mucous membrane, as above described, pushing the cervix backwards and depressing the anterior wall of the vagina, which rolls over it in voluminous folds, forming a deep central sulcus, along the borders of which the denudation is to be made, and which should be more or less divergent, according to the peculiarities and necessities of the individual case.

When the operation is finished, the patient is to be put to bed, the bowels are to be constipated for a week, with a dose or two of some form of opium in the twenty-four hours ; the bladder is to be emptied by catheter

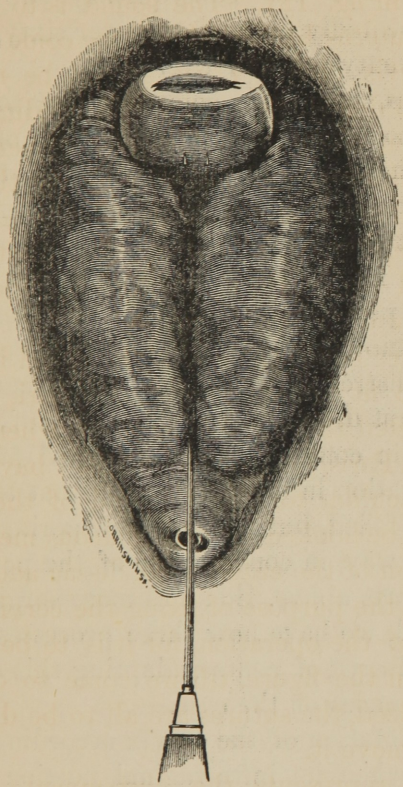

Fig. 127.

when needed, for two or three days, and the recumbent posture is to be enjoined for two or three weeks. The lower sutures may be removed in eight or ten days ; the upper should remain a fortnight, unless there is some special reason for their earlier removal. The patient is usually discharged at the end of a month from the time

of the operation, sometimes sooner. I consider this operation one of the safest in surgery. I never saw any serious accident from it, and never saw it fail but once, and that was in the case of Sir Joseph Olliffe's patient (page 302), who was subsequently cured. I have operated repeatedly on patients over sixty, and on two that were seventy years of age.

Sometimes, as in cases complicated with rectocele, it is necessary to narrow the posterior wall of the vagina, as well as the anterior. If so, I prefer to make two operations, allowing a period of six or eight weeks to intervene between them.

It is not my intention to draw a parallel between this and the perineal operation for procidentia. I only wish to add another resource to our means of permanent cure in this distressing affection. I may state, however, that I was first driven to the expedient of working out this process in consequence of repeated failures of the perineal operation in my hands: not that the operation, as such, ever failed, but that the new perineum made by it often gave way, in consequence of the persistent pressure of the parts above. So far as mere surgical resources are concerned, we have now three processes from which to choose; always, of course, adapting this choice to the peculiar exigencies of the case.

1st. Amputation of the cervix according to the plan of Huguier, when its infra-vaginal portion is too long. I have often seen procidentia cured by this alone. The case of Dr. Bennett, related on page 220, is an example.

2nd. The perineal operation, as performed by Mr. Baker Brown, Dr. Savage, and others.

3rd. The operation of narrowing the vagina by the trowel or triangular-shaped denudation on its anterior

wall, as herein illustrated, and as performed by Dr. Emmet and myself.

But we occasionally meet with those who are so ill-advised as to object to any surgical operation whatever. What then are we to do? Meigs's ring and Hodge's lever utterly fail to do any good whatever; globes, disks, and inflated air-bags all fall out; and Zwang's pessary is the only mechanical apparatus that promises any benefit; and in old women this cannot be tolerated on account of the excessively delicate condition, after change of life, of the vaginal mucous membrane; for as life advances, the vagina becomes more and more intolerant of any foreign substance. Under these circumstances, the best pessary is simply a small tampon of cotton, wet with glycerine, which may be introduced in the morning, to be worn all day. With the porte-tampon, figured on page 285, it is easy enough for the patient to do this every day for herself.

In April, 1865, Dr. Johnston, of Paris, asked me to see a case of procidentia, in a French laundress, about forty years of age, where there was an enormous hypertrophy of the cervix uteri (two inches in diameter), due to the development of numerous little cysts in its substance, varying from the size of a grain of wheat to that of a garden pea. Some fifteen or twenty of these were opened, discharging a ropy honey-like fluid; the uterus was then replaced, and a tampon of cotton wet with a solution of tannin in glycerine was applied. This dressing was repeated every other day for a month or two, when she became so comfortable that she did not desire the operation for a radical cure. When she stops the use of the tampon, the uterus descends on lifting a heavy weight or taking a long walk, but she can now protect herself perfectly against this

accident by applying the cotton pessary with the porte-tampon.

In 1853, Professor Fordyce Barker, of the Bellevue Hospital Medical College, wrote a paper on the treatment of procidentia by the use of tampons wet with a solution of tannin. Considerable success attended this method in his hands, but it seemed to fall into disuse. Perhaps the porte-tampon, as in the case above, may assist to re-instate the practice. When patients will not submit to a radical operation, I have no doubt that this plan may answer a good purpose, even if it does not cure the case permanently.

I had the honour of presenting a paper on Procidentia at the November meeting (1865) of the Obstetrical Society, which formed the basis of an extended discussion. At this meeting, Mr. Spencer Wells called my attention to the fact, that Marshall Hall's idea of narrowing the vagina was put into execution by the late Mr. Heming, and that at least one case had been successfully operated upon. The report of this case may be found in Heming's translation of Boivin and Dugès (1834), page 53, and is dated November, 1831. It affords me pleasure to make this correction.

SECTION VI.

THE VAGINA MUST BE CAPABLE OF RECEIVING AND OF RETAINING THE SPERMATIC FLUID.

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We here propose to pass in review the usual obstacles to the introduction of the semen, and then the conditions that prevent its retention or sojourn in the vagina. For it is not enough that the semen be deposited in the vagina; it must not be immediately ejected.

What, then, are the ordinary obstacles to its introduction? They are mostly anatomical or mechanical, and may be arranged under the following heads:

1st. The hymen may be imperforate or nearly so.

2nd. There may be vaginismus; *i. e.* hymeneal hyperæsthesia with a spasmodic contraction of the sphincter vaginæ.

3rd. There may be atresia of the vagina.

4th. The vagina may be wanting.

1. Our medical literature contains the history of many cases in which the hymen was so tough as to resist all reasonable efforts at penetration. And very many in which it has been found completely occluded, with retention of the menstrual flow. It is a little singular that I have never met with an example of either of these conditions.

All the cases of impenetrable hymen that I have seen were examples of vaginismus, where the obstruction was not in the mere resisting power of this membrane, but in a spasm of the sphincter muscle, the result of the irritable condition of the hymen.

Where the hymen is hermetically sealed up with a retention of the menses, it is easy enough to open it and evacuate the imprisoned secretion by a "crucial incision," as it is termed.

It is against this "crucial incision" that I would seriously warn the inexperienced; as, simple as the operation is, it is fraught with great danger,—not *per se*, but in the consequence of a rapid evacuation of the retained fluid. Whenever it is necessary to perform an operation for retained menses, whether it be on the hymen, the os uteri, or at any point along the vagina between the two, it should always be done by a simple puncture with an exploring needle, leaving the gradual evacuation of the flood to nature and to time. The object of this is to allow the uterus time to contract as its contents slowly ooze away. This is a matter of importance only where there is a considerable amount of fluid. If there is not more than an ounce or two, I do not think it makes any difference whether we evacuate it suddenly or slowly.

The probable amount of fluid may be estimated simply by palpation, which determines with sufficient accuracy the size of the uterus with its contents.

If the uterus be but slightly enlarged by the retained fluid, we may open it fearlessly; but if it approach the size of the fœtal head, we should do it with the greatest caution.

Death has often speedily followed an incision of the hymen, where there was retention of the menses. Of course, the mere wounding of the hymen has nothing whatever to do with the fatal result, which seems to be due to pyæmia. Some think that this is caused by the admission of air into the cavity of the uterus, which, having been over-distended, fails to contract as rapidly as the fluid is evacuated. At the Woman's Hospital we

have had repeatedly to evacuate large quantities of retained menses, and we have never seen any accident follow. All our cases were the result of atresia of some part of the vagina, or of the os tincæ. One only was seemingly idiopathic, the others the result of sloughing from difficult labour.

We have always punctured the occluded portion with an exploring needle, or made a very small opening with the tenotomy knife usually found in our pocket cases; and, knowing the dangers of the operation, I must again insist on this point. If I had now to operate on the hymen of a delicate young woman, whose uterus and vagina held six or eight ounces of fluid, I would give her ergot till its specific action was produced on the uterus, and then make a small puncture in the hymen; and this for the purpose of insuring uterine contraction while the fluid was being evacuated. I cannot do better than to quote here Dr. Graily Hewitt, the latest and one of the best authorities on the diseases of women.*—"The plan ordinarily adopted has been, by means of a lancet, or bistoury, or trochar, to make an opening in the hymen sufficient to allow of the escape of the chief part of the retained blood at once, and at the time of the operation. I would suggest that an opening just large enough to allow of the escape of a very minute quantity of fluid be made at first, and that this opening should be made obliquely in the obstructing membrane, giving it a valvular character. The fluid should be evacuated *guttatim*. If the opening become closed, a second and similar opening to be made the following day, or two or three days later, and a firm but gentle support given to

* "The Diagnosis and Treatment of the Diseases of Women." By Graily Hewitt, M.D., &c., &c. London. 1863.

the abdomen by the aid of a bandage during the whole period of the evacuation of the fluid; the patient to be kept in a state of absolute rest. The aperture in the hymen should not be increased in size until the uterus has returned to its proper dimensions, the object being, at first, simply to allow the fluid to escape in the most gradual manner possible."

Dr. Arthur Farre has given me the particulars of a case of retained menses, which was seen some forty years ago by his father, an eminent physician of his time. A young lady in the country had retention of the menses; pregnancy was suspected by the family physician; Dr. Farre was sent for to decide the nature of the case; but before his arrival the hymen was ruptured spontaneously; a large quantity of retained menses was suddenly evacuated; irritative fever set in, and the patient died in a few days. Although I have frequently heard of a fatal result in similar cases, as a consequence of surgical interference, this is the only one in which I have known it to happen in this way.

2. Vaginismus.—By the term vaginismus I mean an excessive hyperæsthesia of the hymen and vulvar outlet, associated with such involuntary spasmodic contraction of the sphincter vaginæ as to prevent coition. This irritable spasmodic action is produced by the gentlest touch: often the touch of a camel's-hair pencil or fine feather will produce such agony as to cause the patient to shriek out, complaining at the same time that the pain is that of thrusting a sharp knife into the sensitive part. This is worse in some than in others. In a very large majority, the pain and spasm conjoined are so great as to preclude the possibility of sexual intercourse. In some instances it will

be borne occasionally, notwithstanding the intolerable suffering; while in others it will be wholly abandoned, even after the act has been repeatedly and, as it were, perfectly performed.

We can hardly make a mistake in the diagnosis of this affection. It could be confounded only with imperforate hymen or atresia of the vagina, the true nature of which is easily ascertained by examination. In these there is not necessarily inordinate pain on being touched. There is only a mechanical impediment to the passage of a probe or the finger into the vagina, while in the other the gentlest touch, as said before, produces excessive suffering, and this is the chief diagnostic.

To examine a case of suspected vaginismus, place the patient on the back, with the legs flexed; separate gently the labia. The patient will exhibit signs of alarm and agitation,—not that we hurt her, but she feels an indescribable, insuperable dread of being hurt. She is like a timid, nervous person who has once had a pointed instrument thrust into the exposed pulp of an inflamed nerve in a decayed tooth. The very idea of its repetition throws her into a nervous rigour. The degree of general disturbance will depend upon the peculiar temperament of the individual. But be this as it may, when we come to explore the seat of trouble, the strongest will and stoutest frame will exhibit unmistakable signs of excruciating suffering; for the gentlest touch with the finger, a probe, even with a feather, produces great agony. The sensitiveness is at all parts of the vaginal outlet. It is very great at and near the meatus urinarius on each side where the hymen takes its origin; and greater still near the orifice of the vulvo-vaginal gland; but often the most sensitive point is at the fourchette, where the hymen projects upwards. The

whole vulval or outer face of the hymen is sensitive, but it is more so along its reduplication or base. The touch of a probe or a camel's-hair pencil is sufficient.

But while the outer face of the hymen and the adjacent parts are so sensitive, if we turn the patient on the left side and separate the nates and vulva so as to pass a sound through the hymen without touching its outer surface, and then make pressure with it laterally or backwards on the inner or vaginal aspect of this membrane, we will not find there any abnormal degree of sensitiveness.

Touching the outer surface of the hymen in any portion of its reduplication, produces not only pain, but an involuntary spasm of the sphincter muscle both of the vagina and anus. In some instances, the sphincter ani feels as hard as a ball of ivory; and one of my patients supposed it to be a tumour that would require exsection. The supersensitiveness is diagnostic; the spasm pathognomonic.

The most perfect examples of vaginismus that I have seen were uncomplicated with inflammation; but I have met with several cases in which there was a redness or erythema at the fourchette. Usually, the hymen is thick and voluminous, and when the finger is forced through it, its free border often feels as resistant as if bound by a fine cord or wire.

By the term blepharismus, or blepharo-spasmus, we mean an involuntary painful spasmodic contraction of the orbicularis palpebrarum, with great supersensitiveness, or intolerance of light. By the term laryngismus, we mean a spasmodic contraction of the vocal apparatus, producing stridulous inspiration; and, by analogy, I call this painful spasmodic contraction of the mouth of the vagina, vaginismus.

I presented a paper on this subject to the Obstetrical Society of London in December, 1861,* from which I will here extract a few particulars.

In May, 1857, I was called to see a lady, aged forty-five years, who was married at twenty, and had been an invalid ever since. Menstruation, always painful, had just ceased. She had great irritability of the bladder, a sense of bearing down, and other symptoms of uterine derangement. But to me the most remarkable thing in her history was the fact that she had remained a virgin notwithstanding a married state of a quarter of a century. Some two or three years after marriage her physician discovered a sanguineous mucous tubercle at the meatus urinarius, which he removed, and then attempted to dilate the vagina with graduated bougies, which produced great suffering, without the least permanent improvement. She consulted the most eminent surgeons in the principal capitals of America, and subsequently visited London and Paris for the same purpose; but no one gave a satisfactory solution of the case, nor advised anything more than the bougie system, which had been already fruitlessly exhausted.

Her nervous system was in a deplorable condition. She was exceedingly impressible, the slightest noise being intensely disagreeable. She was able to walk only across her room, but did not often venture on this experiment, being confined most of the time to her couch, where she gave herself up to unceasing intellectual effort.

I attempted to make a vaginal examination, but failed completely. The slightest touch at the mouth of the

* "Obstetrical Transactions," 1862, vol. II.

vagina produced intense suffering, throwing her nervous system into great commotion; there was a general muscular agitation; her whole frame shivered as if with the rigours of an intermittent; she shrieked and sobbed aloud; her eyes glared wildly; tears rolled down her cheeks, and she presented altogether the most pitiable appearance of terror and agony. Notwithstanding all these outward involuntary evidences of physical suffering, she had the moral fortitude to hold herself on the couch, and implored me not to desist from my efforts if there was the least hope of finding out anything about her inexplicable condition. After pressing with all my strength for some moments, I succeeded in introducing the index finger into the vagina up to the second joint, but no further. The resistance to its passage was so great, and the vaginal contraction so firm, as to deaden the sensation of the finger, and thus the examination revealed only an insuperable spasm of the sphincter vaginæ. I candidly told her husband I knew nothing whatever about the case, had never seen or heard of anything like it, and therefore could promise nothing. However I suggested the propriety of their going to New York, for further investigation under anæsthesia. They acted promptly on this suggestion, and I invited the late Dr. John W. Francis, Dr. Emmet, of the Woman's Hospital, Professor Van Buren, and Dr. Kissam to see her with me. The two latter-named gentlemen assumed the responsibility of the etherization. Previously to the anæsthesia I attempted to make a vaginal examination, when the same train of symptoms was manifested as on the former occasion. But as soon as she was fully under the influence of the ether, I found, greatly to my surprise, the mouth of the vagina completely relaxed and the vagina itself perfectly normal.

It was not large, but certainly quite as well developed as it ought to have been at her time of life and under the circumstances. The uterus was retroverted, and there was a small polypoid excrescence about the size of a pea hanging from the os tincæ. This was removed, not with the expectation of its exerting any influence on her peculiar condition, but to prevent the risk of its future growth. I gave the opinion that it was a spasmodic contraction of the sphincter vaginæ, resulting from an irritable condition of the nerves of the part, which I could not explain. When asked if it was possible to cure it, I said—"I do not know, for the books throw no light on the subject; but it appears to me that the only rational treatment would be surgical." However I declined to do anything, on the ground that an untried process was not justifiable on one in her position in society, the hospital being the legitimate field for experimental observation.

This case is an exaggerated example of its class. I have seen several nearly, but not quite, as bad. The high intellectual endowments of this lady, her elegant culture and fine social position, as well as her long suffering, all conspired to make her case one of much thought and great anxiety to me ; and it was not easily dismissed from my mind. It was the first case of the sort I had ever seen, and I could not help wondering if it would be the last. But about fifteen months after this, Professor Pitcher, of Detroit, Michigan, sent me another similar case, except that the lady had been married but two years. She had the same instinctive dread of being touched, the same muscular agitation and shivering of the whole frame, and the same pain and spasm of the sphincter on attempting to pass the finger into the vagina. As this lady's husband threat-

ened to obtain a divorce, I looked upon her case as a proper one for experiment. Explaining to her fully our ignorance on the subject, I proposed a series of experimental incisions, which she readily assented to. Thinking that the division of the irritable spasmodic outlet was the only rational operative procedure, I divided first only the edges of the hymeneal membrane on each side of the fourchette. There was no relief. Waiting for the wounds to heal, I then divided the parts again at the same points, but extending the incisions deeply through the mucous membrane and through some of the fibres of the sphincter muscle. This was followed by some improvement; she could bear the introduction of one finger without very great pain, and could even tolerate two, but it was with considerable suffering. I now saw that the hymen itself was the focus of the excessive irritability, and I then proposed to cut it out entirely, and afterwards to repeat the lateral incisions as before, making them deeper, and rendering the dilatation permanent by the use of a properly constructed bougie. By this time the mother of my patient came to the conclusion that I was experimenting on her daughter. I told her it was true, and attempted to justify the propriety of the course when a lawsuit and a divorce were in prospect. The mother, however, was inexorable, and unfortunately removed her daughter from my care. But her improvement was so great that I had no doubt of her ability to fulfil the duties of a wife under some difficulties. The experience gained by this case was of great value to me.

A few weeks afterwards, January, 1859, another case fell into my hands. This patient was the wife of a clergyman, and had been married six years. Sexual intercourse was impossible. Several surgeons had been consulted, but

without any explanation of her condition, and of course without any relief. On examination, I discovered a sanguineous, mucous, painful tumour at the meatus urinarius, and notwithstanding the experience already related, I persuaded myself that this tubercle was alone the source of all her trouble. It was removed, and its seat cauterized. In due time she returned home, but came back to me in a few days to report a persistence of her former sufferings. On a more minute examination, I found it to be in all particulars just such a case as those previously related, but not quite so intense in its manifestations. The slightest touch with a feather or with a camel's-hair pencil at the reduplication of the hymeneal membrane produced as severe suffering as if she were cut with a knife. While this lady was under observation (April, 1859), a fourth case of the same sort came under my care, that of a woman who had been married three years. Sexual intercourse had been imperfectly accomplished a few times during the first few weeks after marriage. She innocently supposed that all women had to suffer as she did, and tried to bear it; but her sufferings were so severe that at last she looked with the greatest terror upon the approaches of her husband. At her earnest entreaties, he ceased all efforts at sexual intercourse, and they lived together like brother and sister. But at last the mother of the poor timid girl began to wonder why, after three years of married life, her daughter, who seemed to be healthy and had a healthy vigorous young husband, did not become pregnant, and ventured to speak of her disappointment; whereupon the daughter hesitatingly explained it all to the mother, who immediately brought her to see me, when I found precisely the same condition of things already described. A few weeks after this, Dr. Harris, of East Thirtieth

Street, New York, sent me another case (the fifth). His patient had been married two and a half years, and sexual intercourse was impossible. I now (June 18th, 1859) had three cases all at one time under observation; but to cut short this long narrative, I may here say that they were all, after many experiments and disappointments, perfectly cured in the following August.

From personal observation I can confidently assert that I know of no disease capable of producing so much unhappiness to both parties of the marriage contract, and I am happy to state that I know of no serious trouble that can be cured so easily, so safely, and so certainly.

Treatment.—The treatment consists in the removal of the hymen, the incision of the vaginal orifice, and subsequent dilatation. The last is useless without the first two, but is essential to easy and perfect success with them. I usually make two operations, but it may all be done at once.

Placing the patient (etherized) on the left side, I seize the hymeneal membrane with a delicate pair of forceps just at its junction with the urethra on the left side, and putting it on the stretch, clip with properly curved scissors till the whole is removed in one continuous piece.

In some cases the hæmorrhage requires a compress of lint. In two instances the bleeding was excessive, but easily checked with the Liq. Ferri Persulphatis. The cut surface usually heals entirely in three or four days, after which the operation for a radical cure may be performed. Notwithstanding the removal of the thick, sensitive hymen, the cicatrix marking its original place at the mouth of the vagina is exceedingly sensitive, and in some instances feels hard and tense, as if

a wire or small cord were constricting the outlet. This I divided at various points and in divers ways during my early experiments, and finally arrived at the following method, as being the surest and best.

Place the patient (fully etherized) as for lithotomy, on the back; pass the index and middle fingers of the left hand into the vagina, separate them laterally, so as to dilate the vagina as widely as possible, putting the fourchette on the stretch; then with a common scalpel make a deep cut through the vaginal tissue on one side of the mesial line, bringing it from above downwards, and terminating at the raphé of the perineum. This cut forms one side of a Y. Then pass the knife again into the vagina, still dilating with the fingers as before, and cut in like manner on the opposite side from above downwards, uniting the two incisions at or near the raphé, and prolonging them quite to the perineal integument. Each cut will be about two inches long, *i. e.* half an inch or more above the edge of the sphincter, half an inch over its fibres, and an inch from its lower edge to the perineal raphé. Of course this will vary in different subjects according to the development of the parts in each. To perfect the cure it is necessary for the patient to wear for a time a properly adapted bougie or dilator. I use a dilator made usually of glass, sometimes of metal or ivory. I prefer glass because it is easily kept clean, and being transparent, it is easy to see the cut surface, and indeed the whole vagina, without removing it. If there is much bleeding, I introduce the dilator at once; but usually I wait twenty-four hours, when it is worn one, two, three, or four hours at once. Its introduction is attended with a sense of soreness, but with none of the peculiar agonizing suffering so characteristic of the original disease.

The patient will generally wear the dilator two hours in the morning and two or three hours in the afternoon or evening; sometimes for a longer period. I have known a few who wore it six or eight hours at a time. I have often been astonished at the rapidity with which the cuts sometimes healed, the cure being seemingly facilitated by the pressure of the glass tube.

I direct the dilator to be worn daily for two or three weeks, or longer, or till the parts are entirely cured and all sensitiveness removed.

The dilator is a tube about three inches long, slightly conical, open at one end, closed at the other, and an inch and a quarter or an inch and a third in diameter at the largest part, near the open or outer end.

There is a depression or sulcus on one side for the urethra and neck of the bladder (fig. 128).

The outer open end allows the pressure of the atmosphere to assist in retaining it easily in the vagina.

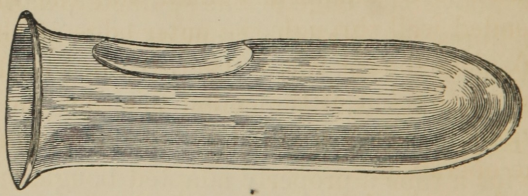

Fig. 128.

When closed at both ends, it is much more difficult to retain it *in situ*, even with a well-adjusted T bandage. The depression for the urethra is very important, for I found that a perfectly round cylinder, worn for three or four hours, always injured the urethra ; and, moreover, this urethral depression assists the self-retaining capacity of the instrument.

Dr. Rottenstein, a celebrated American dentist in

Paris, has recently made for me a dilator of vulcanite, which answers very well. It is quite as cleanly as glass, and is not so liable to be broken.

While these pages were going through the press, I had occasion to operate on a lady fifty-four years of age, who was married at eighteen, a widow at twenty, and married again at forty. During her first marriage copulation was effected occasionally, but it was under most trying circumstances, and with the most intense suffering. During her last marriage it was impossible. I found the mouth of the vagina a little reddish, inflamed, and excessively irritable, the slightest touch with a probe producing intense agony. The finger could be passed into the vagina, but it caused great suffering. It was, and had always been, a well-marked case of vaginismus. The hymen did not present any undue development, and I simply incised the parts on each side of the middle line, through to the verge of the perineum. The whole vulvar outlet was unnaturally small, and the incisions were extended well through the outer edge of the perineum. A glass dilator was worn three or four hours a day for a month ; but at the end of this time the mouth of the vagina was just as sensitive and as spasmodic as before the operation.

I now determined to remove all the hypertrophied tissue at the fourchette and divide anew the parts beneath. Wishing to make pressure with the dilator more in the direction of the fourchette and perineum than laterally, I had the instrument made as represented in fig. 129, which seems to be a great improvement on the purely cylindrical instrument. Instead of expanding the outer end of the dilator, as seen in fig. 128, it is often necessary to roll its border inwards to prevent pressure on the labia.

In some instances the instrument is too long, and produces pain by pressure against the cervix uteri. It will then be necessary to make it shorter. The downward curvature of the conical extremity, as here represented, prevents it from striking against and hurting the uterus.

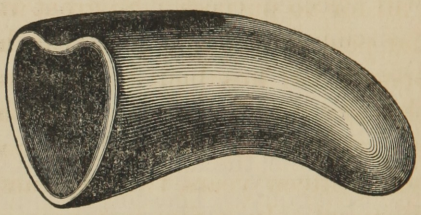

Fig. 129.

I have now operated on thirty-nine cases of vaginismus, and in every instance with perfect success. Many of these were complicated with other causes of a sterile condition, such as painful menstruation, contracted os, conical cervix, fibroid tumour, or malposition. But notwithstanding this, six conceptions have followed the operation. Some others, from whom I have not heard, have probably conceived, and a few more of them will almost certainly do so. They have usually been so well satisfied with the removal of the vaginismus that they did not care to undergo any further treatment for a condition that might be attended to at a more convenient season.

Churchill, Debout, and some others, have thought that a state of vaginismus could hardly exist long where the husband possessed strong copulative capacity; but I am sure this is an error; for I have seen several instances in which the virile power of the husband was unusually strong, but yet powerless to overcome the

obstruction; and I have seen two cases that had been subjected to the most powerful means of dilatation, long continued, and to a great degree; and yet the spasmodic action remained just the same. One of these has now been married eighteen years; and for six months she submitted, many years ago, to the torture of a trivalve dilator passed into the vagina, and opened to its widest extent: and all for no purpose. So great was her dread of the peculiar pain of this affection that her husband could not persuade her to submit to an operation at my hands, and thus she remains as at her marriage.

I have operated on those who had been married seventeen years, fifteen years, twelve years, and so on down to two years. In a few instances sexual intercourse had been imperfectly accomplished, but in the great majority of cases it had never been consummated. In two instances, the husbands, though young and vigorous, were so excitable that the semen was quickly lost, but in both of these cases the vaginismus was so inveterate that I am sure it would have persisted even under other circumstances.

Dr. T. G. Thomas, of New York, gave me the history of a case in which a physician etherized his patient, and then left her to her husband, who cohabited with her with the greatest ease; but he could not repeat the act when she was not etherized. Fortunately, the period was well chosen, for this single act of copulation was followed by conception. I have known other cases where conception occurred without the introduction of the virile organ. The seminal fluid was lost at the mouth of the vagina, and a little was doubtless injected through the hymeneal opening, and made its way to the cavity of the uterus.

Sir Joseph Olliffe has given me the history of a case

of this sort, where conception occurred without penetration of the hymen. It is not uncommon to hear of a pregnancy at full term where the hymen is unruptured. I presume that all such cases are examples of vaginismus.

Many surgeons are of opinion, since I first described this affection, that it is sufficient to forcibly dilate the mouth of the vagina, or to incise it, and then use the dilator; but I am well satisfied that the plan of removing the hymen entirely is much the best; not only of removing the hymen, but of removing any and every super-sensitive point.

In 1863, I saw a lady with vaginismus who had been married six years, and during all this time she had submitted to sexual congress, notwithstanding the intense suffering that it occasioned her. I found the hymen unbroken, but dilatable. It was exceedingly tough, and would stretch almost like an india-rubber string. I used my speculum, pulling the perineum far back towards the coccyx, which opened the mouth of the vagina sufficiently for any purpose. This was attended with great pain, but the hymen did not give way. I excised it, divided the fourchette, and used the dilator till the parts were healed. She went home, but returned in a few days to say that sexual intercourse was as unbearable as ever. On a minute examination, I found a small tubercle of indurated tissue on the right side of the mouth of the vagina, not larger than a grain of wheat. It was very sensitive even to the touch of a camel's-hair pencil. It was hooked up with a tenaculum, and cut out, and immediately the peculiar sensitiveness of the part was gone. The relief afforded was as sudden as it would have been by the removal of a subcutaneous neuromatous tumour. Indeed it has always

appeared to me that the symptoms of vaginismus were neuromatous. However, my friend Professor Alonzo Clark, one of the ablest pathologists in my own country, has frequently examined the vaginismus hymen for me, and could not find any enlarged nerve filaments running through it.

The case above related was cured by the slight operation performed the second time.

Fig. 130 represents the exact size of the hymen in this case, immediately after its removal. The indentation on its left side corresponds precisely with the seat of the little tubercle removed at the second operation, and which was doubtless the result of the imperfect excision of the thickened base of the hymeneal membrane. This case proves very conclusively how important it is to exsect the hymen in its totality; for here a small point was left which produced great suffering afterwards. But to show to a greater certainty the propriety of this course of treatment, I will here relate a most remarkable case that fell under my observation a few years ago.

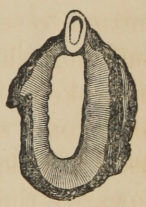

Fig. 130.

A lady, aged thirty, was married at twenty-one. Vigorous efforts at copulation were made fruitlessly for five or six weeks. The husband and wife were both young and of course ignorant on the subject, and were not surprised that there was difficulty at the beginning; but soon they began to debate the point of asking medical advice. At last the wife became worn out with the oft-repeated and painful efforts at coition, and agreed to a consultation.

The family physician was called, who supposed that there must be some unusual degree of disproportion in

the relative development of their respective genital organs, and advised sexual intercourse while the wife was etherized. This was soon done and the wife knew nothing of it. But when the act was attempted the next day and the next, it was found to be utterly impossible. After a week's fruitless trial, the physician was sent for again, and again she was etherized, and coition effected with the greatest ease. But it was subsequently impossible when she was not etherized. The husband was tall, athletic, and muscular; says he is not subject to hasty ejaculation, and possesses extraordinary copulative powers. So that it was not the fault of the husband that the vaginismus did not yield to penetration and dilatation. But the subsequent history of this interesting case bears still more strongly on this point. Suffice it to say that it became the business of the physician to repair regularly to the residence of this couple two or three times a week to etherize the poor wife for the purpose above alluded to. They persevered, hoping that she would become pregnant and that delivery would cure her. This etherization was continued for a year, when conception occurred. But during the whole period of utero-gestation, etherization was necessary to coition. After the birth of the child there were a few copulations without ether, but it was exceedingly painful, and soon the pain became so severe that they were compelled to resort to ether again. At the end of another year of ethereal copulation, there was another conception, which resulted in an abortion at the third month. After this she was etherized constantly for nearly another year, when at last they saw no hope of a cure, and becoming alarmed at the frequent repetition of the anæsthesia, they concluded to give it up altogether. And when they consulted me there had been no effort at

copulation for three or four years. They had consulted other physicians in the mean time, but no one explained the case or proposed a remedy.

The mouth of the vagina was barely large enough to admit the index finger. The seat of the hymen was red, inflamed, thickened, indurated, and exceedingly sensitive to the slightest touch with the finger, a probe, or a feather. There was a reddish blotch, about the size of half a split pea, at the orifice of each vulvo-vaginal gland. The perineum had been lacerated down to the fibres of the sphincter muscle, and now a tense, inelastic inodular band extended across the fourchette, and was lost in the thickened tissue occupying the original seat of the hymen. This entire ring was quite as sensitive to a gentle touch as the most marked case of vaginismus could be; indeed, it was a vaginismus now, notwithstanding the fact that coition had been accomplished scores, nay, hundreds of times, and that a labour at full term and a miscarriage had also occurred to break up the morbid condition, if it could be done by the mere mechanical action of distension. I would not pretend to deny that we can dilate a case of vaginismus so as to permit sexual intercourse, but in most of the cases so treated the act is very painful. In every case that I have operated upon by removal of the hymen, and then by division and dilatation, sexual intercourse has been accomplished without pain.

The course to be pursued in the case we are describing was very plain, viz., to remove the whole ring of thickened tissue that encircled the mouth of the vagina, and particularly the cicatricial portion at the fourchette. This was done, and then the septum between the fourchette and the rectum was divided on each side, down through the fibres of the sphincter

muscle and the fourchette to the perineal raphé. This left a very thin partition between the two outlets. After this a glass vaginal dilator was introduced, and worn almost constantly. A larger one was used in a day or two, and in a fortnight sexual intercourse was accomplished for the first time without pain. Where there is cicatricial tissue, as in this case, there is danger of a relapse, and hence greater necessity for a prolonged use of the dilator. This remarkable case presents many points of interest, not the least of which is the fact that the two conceptions took place while she was in a state of complete anæsthesia.

3. Atresia Vaginæ.—This, of course, forms an obstacle to the reception of the seminal fluid. It may be congenital or accidental,—more frequently the latter, and oftener the result of tedious labour, followed by sloughing. The records of the Woman's Hospital present a number of cases of atresia, a few of which will serve as examples.

I have seen but one case that might be called congenital; and that was in a young girl aged eighteen, who entered the Hospital in October, 1857, complaining of great pain every month without ever having had the slightest show. She had taken aloetic purgatives and other emmenagogues without benefit.

On examination, a rounded tumour, half as large as a fœtal head, supposed to be the uterus, could be felt in the hypogastrium. The finger passed through the hymen, which was very rigid, detected a hard inelastic tumour, three-quarters of an inch beyond it, the vagina seemingly ending there in a cul-de-sac. By passing the finger into the rectum, it came in contact with the tumour felt through the vagina, and which appeared

to be the upper two-thirds of the vagina distended with something hard and inelastic, and continuous with the tumour that rose above the symphysis pubis.

The rational symptoms and anatomical relations all pointed to retention of the menses by occlusion of the lower third of the vagina. But to the sense of touch per rectum, with supra-pubic pressure or palpation, it felt exactly like an osteo-fibroid tumour. The lower or vaginal part of the tumour was quite as unyielding to pressure as the upper part or uterine portion.

Fig. 131 represents the relations of the utero-

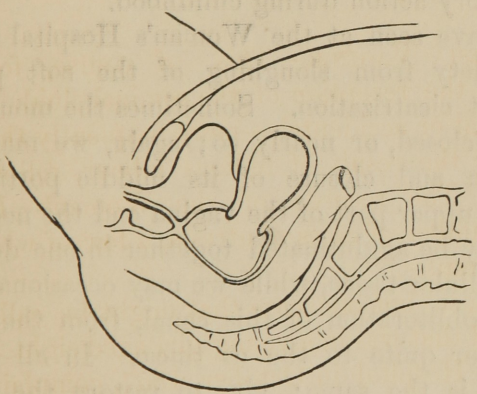

Fig. 131.

vaginal tumour, formed by the occlusion of the walls of the vagina. A very small puncture was made into the tumour, through the occluded vagina where the tissue seemed to be about a half inch thick. The fluid gradually oozed away. There was no constitutional disturbance; and the patient experienced only relief from its evacuation. When the uterus was found diminished to its normal size, we ventured to enlarge the opening sufficiently to pass the index finger up to the os tincæ, and we kept it dilated

to this moderate extent till the divided parts were covered with mucous membrane. The os and cervix uteri presented a remarkable state of granular erosion, extending over the adjacent portion of vagina, and giving rise to a profuse albuminoid leucorrhœal discharge, which yielded to appropriate treatment in the course of a month. The next menstruation was normal, and she left the Hospital with the vagina slightly narrowed at the original seat of occlusion.

This case might have been congenital, or the opposing sides of the vagina might have formed adhesions by inflammatory action during childhood.

We have seen at the Woman's Hospital atresia in great variety from sloughing of the soft parts and consequent cicatrization. Sometimes the mouth of the vagina is closed, or nearly so; again, we may have a contraction and closure of its middle portion; and, again, the upper part of the vagina and the neck of the uterus may be agglutinated together in one dense mass of fibro-cellular tissue, while we may occasionally find a complete obliteration of this canal, from the neck of the bladder quite to the os tincæ. In all cases the treatment is the same; viz., to restore the canal, if possible, and to keep it open, by the use of the glass dilator, till the newly exposed surfaces become covered with mucous membrane. In some instances this will be done in three or four weeks. The constant wearing of the dilator greatly facilitates the healing of the raw surfaces and the conversion of mere cellular into mucous tissue. There is always such a tendency to contraction that I have directed the dilator to be used every day for a long period of time.

I have seen a great many cases of occlusion of the vaginal outlet, where there was an opening perhaps

not larger than a small probe for the passage of the menstrual flow. I have seen several in which it was impossible to find this small opening till the occurrence of the flow indicated it. From these I will select but one to illustrate the treatment. A lady, forty-six years old, was placed under my care in April, 1858, to be treated for atresia. She was married at fourteen; became a mother at fifteen; labour tedious; head impacted; delivery instrumental; child still-born; sloughing of soft parts; slow recovery; atresia vaginæ; sexual intercourse impossible afterwards. Eminent surgeons were consulted, amongst others the distinguished Drs. Physic and Dewees, of Philadelphia, in 1828. Nothing was done. No attempt even was ever made to open the passage. In a few years afterwards her husband died. Strange as it may seem, this lady married again in three years. In three years more she was a widow for the second time. But the most unaccountable thing is, that she married again, after remaining a widow for nearly eighteen years and knowing at the same time that she had had perfect occlusion of the vagina for nearly thirty years. She had been married the third time about twelve months when I saw her. The mouth of the vagina was sealed up, as it were, by a cartilaginous barrier, quite unyielding to the strongest pressure. But there was a small valvular opening through which the menses made their exit.

This little opening barely admitted a small probe; but this could be passed the whole depth of the vagina, and its point could be felt by the finger in the rectum depressing the recto-vaginal septum, as it was pushed onwards to the os tincæ. Menstruation was normal, and the uterus, of natural size, was in proper position.

The vagina was normal above the point of occlusion, which was a little anterior to the neck of the bladder, as shown by fig. 132.

This case was operated on in June, 1858, the late Drs. V. Mott and John W. Francis, with Dr. Emmet, assisting. A small blunt-pointed bistoury was passed through the little opening into the vagina, and the gristly structure was divided from side to side, and then the blade of the knife was turned downwards and backwards, cutting outwards, parallel, as it were, with the ascending ischial ramus, first on the right and then on the left, keeping the index finger in the rectum, to avoid making a recto-vaginal fistula.

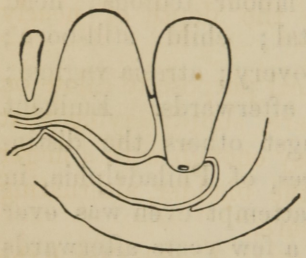

Fig. 132.

In this way the mouth of the vagina was made quite large enough, and when the finger was passed in, it was found to be sufficiently capacious above. The glass dilator was introduced, and I had the happiness of sending this lady away in the course of a month perfectly fitted for the married life.

I directed her to wear the instrument a while every day for an indefinite period, to guard against the common accident of relapse

I might relate many more very curious and interesting cases illustrating this point, but I forbear, as enough has been said to establish the principles that are to guide us in practice.

4. Congenital Absence of the Vagina.—I have seen five cases of congenital absence of the vagina, and in all of them there was no uterus. One of

these, shown to me by Dr. Livingston, of New York, had been married seven or eight years. She was married young, and, of course, had no idea of her peculiar condition. The labia were normally developed, and the membranous tissue between the meatus urinarius and the fourchette had by constant use been pushed up between the base of the bladder and the rectum till it was developed into a blind pouch, into which the finger could be passed to the depth of nearly two inches.

As it would serve no practical purpose to dilate on this subject, I shall leave it here, simply saying that the diagnosis in such cases is easy enough with a finger in the rectum, and a sound in the bladder, alternating the latter with supra-pubic pressure.

At the beginning of this section, I said that "the vagina must be capable of receiving and of retaining the spermatic fluid."

Having now considered such obstacles as would prevent the deposit of the seminal fluid in the vagina, we may turn to such conditions as prevent its retention there when once introduced.

It has only been about three or four years since I found out that some vaginas would not for a moment hold a drop of semen.

There are no two vaginas exactly alike. They differ in length, in their various diameters, in their relations with the bladder and rectum, in their course with regard to the pelvian axes, and in their relation with the axis of the uterus. They sometimes refuse to retain the semen when they are very capacious; again, when they are too short. In this last instance, there will probably be found a disproportion between the sizes of the respective genital organs of the two sexes.

A young woman, married five years, without issue, consulted me on account of her sterility. The cervix was rather indurated; the os was small. I cut it open, and the os afterwards presented quite a normal appearance. As there was nothing otherwise abnormal about the uterus, I told her she would almost certainly conceive in four or five months. She patiently waited eighteen months, and then came to me again in despair. The condition of the uterus was now all that I could have wished it to be; but the vagina, as before said, was rather short. For the first time I now suspected that perhaps the fault lay here. I requested her to come to me at some early day, two or three hours after sexual intercourse. She came the next morning. I did not find any signs of spermatozoa in the mucus of the vagina, or in that of the cervix uteri. I then began to suspect that the fault lay with her strong, vigorous husband. I asked her if she seemed to retain anything after coition. She said it all appeared to pass off instantly. In such a case, all false delicacy must be laid aside; it is a matter of the gravest scientific importance, and must be treated as such.

I told her and her husband that I must see her just after sexual intercourse. The time was appointed; I was at the house, and in four or five minutes after the act I saw my patient; and the vagina did not contain a drop of semen, but it was on her person and napkin in the greatest quantity. The microscope showed that it was perfectly normal. What was to be done? The vagina was short—too short; it could not be made longer. When the finger was pushed forcibly against the posterior cul-de-sac, in the direction of the dotted line *a*, fig. 133, it yielded to the pressure, and

as the finger was withdrawn, the cul-de-sac sprang forward, almost as if it were made of a thin sheet of India-rubber. This reaction of the distended vagina evidently ejected all the semen that did not at once regurgitate in the very act of ejaculation. Of course the remedy was self-suggestive. As we could do nothing to change the size or form of the vagina, we had only to order what was so evidently indicated—something to prevent the forcible impingement of the male organ against the posterior cul-de-sac. This had the desired effect; the semen in sufficient quantities was retained, and conception occurred in three months, after a sterile marriage of nearly seven years. I now think it probable that the operation performed on the cervix uteri was not at all necessary; for never till I saw this case had I the remotest idea of such a state of things as I have here described.

Fig. 133 would represent about the relations of the vagina and uterus in the case described above.

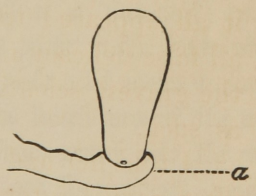

FIG. 133.

But it must not be inferred that all short vaginas are necessarily associated with a sterile condition. I have seen several cases in which the vagina had been almost wholly destroyed by the sloughing process, and in which the neck of the uterus had also sloughed away to a great extent: where, in fact, the vagina was not more than two inches deep, and yet conception occurred with the greatest facility; but in every one of these cases the upper part of the vagina was fixed with the open os presenting at its bottom; it was unyielding, inelastic, did not give before pressure, and, of course, did not

rebound on its removal. Thus it was possible for the semen to enter at once into the canal of the cervix.

Amongst several cases of this sort, I now call to mind one of vesico-vaginal fistula, sent to the Woman's Hospital, in 1857, by Dr. Dimond of Auburn, New York, in which almost the whole anterior wall of the vagina, a large part of the cervix, and the posterior cul-de-sac, and a large portion of the posterior wall of the vagina, were lost. There was but a small strip of the anterior wall, just at the neck of the bladder; the fistulous opening was two inches wide, reaching from one pubic ramus across to the other, through which the inverted fundus of the bladder fell into the vagina, presenting at its posterior border the open mouths of the ureters, from which we could see the urine passing off as it was secreted. This case was cured, but the vagina was not more than two inches deep. I had but little thought that she would ever conceive again; but in ten months after returning home she became a mother; and again, in about fifteen months after this, she gave birth to twins. In four other cases like this, the vagina was quite as short, and in all it was fixed and inelastic at its upper part; and in all, the intra-vaginal portion of the cervix uteri had been destroyed by the sloughing process, and the os presented itself as a little gaping slit in the centre of the fibrous structure that formed the upper boundary of the vagina, which stretched across the pelvis like a cord of cartilage.

In all these cases but one, the shortening of the vagina tilted the fundus uteri backwards, and placed the axis of the uterus in a direct line with that of the vagina, so that the meatus urethræ must, at the moment of ejaculation, have been in direct contact, and in a straight

line with the open end of the canal of the cervix uteri. I have seen many sterile wombs, where I thought the sterile condition could be overcome if it were possible to imitate artificially the unfortunate state of things here produced accidentally, *i. e.*, fixing immovably the open os in a direct line with the ejaculative force. This would lead me now to enquire into the rationale of the entrance of the semen into the cavity of the uterus; but I shall leave this for the next section.

But sometimes the vagina does not retain the semen even when it is of large proportions. When this is the case we almost always find the uterus retroverted.

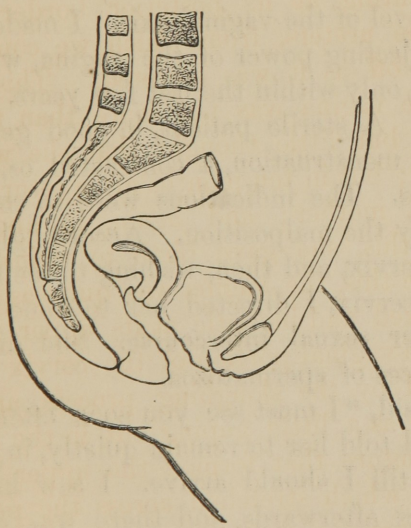

Fig. 131.

I have now but little doubt that, in many cases of retroversion, in which I have seen pregnancy follow the rectification of the malposition, the sterile state was due to the fact that the vagina did not retain the semen.

I do not mean to say that in all cases of retroversion the semen is not retained: far from it; for I know that it is often retained in ample quantities, in even the worst cases of retroflexion, such as that shown in fig. 134.

The philosophy of this is plain enough; for the vagina is here almost in its normal relations, with what should be the proper axis of the uterus, although this is flexed out of its normal position. The uterine malposition that is most unfavourable to the retention of the semen by the vagina is that of retroversion, with the os tincæ lying close up behind the inner face of the pubes, and the fundus, of course, thrown backwards below the level of the vaginal axis. I made this discovery of the ejecting power of the vagina, where there is retroversion, only within the last few years. It occurred in this way. A sterile patient, in good general health, had painful menstruation, a contracted os, and a retroverted uterus. The indications were to enlarge the os and to rectify the malposition. Accordingly I cut open the os and cervix, and then, wishing to see if the semen entered the cervix, I directed her to come to me some morning after sexual intercourse. She did so, but I found no traces of spermatozoa.

I then said, "I must see you soon after the act of coition;" and told her to remain quietly, in the horizontal position, till I should arrive. I saw her in six or eight minutes afterwards, and there was not a vestige of semen in the vagina, but it was found in the greatest abundance outside and on the napkins. The vagina was very capacious, far above the average size; and I could hardly believe my senses when I found that it contained nothing. It was then arranged that I should see my patient in fifty or sixty seconds after coition, and

I found precisely the same state of things, viz., not a sign of semen in the vagina. Now, let us see why this was so. But first it might have been supposed that it was due to hasty ejaculation. Proper inquiry settled that question in the negative by the evidence of both man and wife. Why, then, was there no semen in this very capacious vagina immediately after a normal copulation? Let us look at its anatomical relations. The uterus was retroverted, but anteflected; the cervix was long and pointed, and rested against the urethra; the body of the uterus was somewhat hypertrophied; the anterior wall of the vagina rather short, in consequence

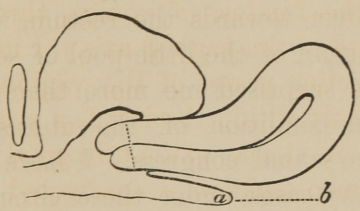

FIG. 135.

of long error of position; the vagina was otherwise very large, and the perineum relaxed. The finger carried to the bottom of the vagina, at its reduplication, *a*, fig. 135, could push this back towards the hollow of the sacrum relatively as far as *b*; this would necessarily throw the fundus upwards; the withdrawal of the finger would let it fall down again, but its momentum would carry it a little lower than the point at which it rested in equilibrio. There was nothing easier of demonstration than this see-saw movement of the uterus by pushing the posterior cul-de-sac backwards. Now the tendency of this falling of the organ by the sudden removal of a force thus impinging against the point *a*, is to depress the fundus still more, which thereby proportionally elevates the cervix; this draws up also the

cul-de-sac of the vagina, and rolls out, as it were, whatever has been deposited in it. In this particular case, the vagina would spring back from *b* to *a*, and this of itself would eject the fluid. Besides, in all cases when we examine the condition of the uterus immediately after coition we shall find the organ presenting signs of exhaustion, if I may be allowed such an expression; for instance, if the uterus is in a normal position, or even moderately anteverted, we shall find the upper part of the vagina relaxed, and passively holding a large quantity of semen, in which the cervix uteri is submerged; the uterus itself seems to be fatigued, and drops by its own gravity down towards the rectum, where it lazily sinks to the bottom of the little pool of semen.

Nothing has surprised me more than the difference in the relative condition of the uterus and vagina before and after sexual congress. I have had occasion to examine many cases under these circumstances, and I have uniformly found this as I have here described it; and when there is retroversion the fundus sinks still lower after coition than before, and this necessarily elevates the os tincæ still farther from the seminal fluid, if any of it have been retained. I have seen many cases of retroversion latterly where the semen was not retained. I could give some most interesting details on this point, but enough has been said to show the importance of the subject, to illustrate its philosophy, and to indicate the proper treatment; which, of course, would be to place the uterus in its normal position, and to retain it there by means of a properly-fitted instrument to be worn during sexual congress. In the case figured above, amputation of the cervix at the point indicated by the dotted line would be advisable before attempting further treatment.

SECTION VII.

FOR CONCEPTION, SEMEN WITH LIVING SPERMATOZOA SHOULD BE DEPOSITED IN THE VAGINA AT THE PROPER TIME.

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This proposition naturally involves three considerations:

1st. The nature and properties of semen.

2nd. Its passage to the cavity of the uterus; and

3rd. The proper time for this.

The seminal fluid, as ejected in the act of copulation, is composed of the secretion of the testes, mixed with that of the vesiculæ seminales, prostate and Cowper's glands.

The office of the testes is to secrete the semen, which is composed of the liquor seminis, granules, and spermatozoa.

If we take a drop of semen from the vagina immediately after sexual intercourse, and place it under the microscope, we shall see the hurried movements of seemingly thousands of spermatozoa. But this is not the best way of studying the phenomena of their movements. The best plan is to take a drop of mucus from the canal of a perfectly normal cervix uteri some fifteen or twenty hours after sexual intercourse. We shall then be better able to examine the spermatozoa; for we shall see them in the fluid that serves as the means of their finding their way towards the ovum. We shall find them moving more slowly, more cautiously, if the term may be allowed. Suppose we select any one sperma-

tozoon for observation, and note particularly its various actions and movements. It will swim first one way and then another, or move in a straight line across the field of vision; and perhaps turn abruptly to retrace the path already traversed. If it encounters a large epithelial scale it stops, places its head against it, as though trying to push it forwards; and when it fails so to do, it turns and moves off slowly in another direction, perhaps to encounter another opposing obstacle, to pause a moment and make another effort to overcome it, and then to turn again in search of some new field of exploration.

Fig. 136, *a*, represents the appearance of spermatozoa in a normal state. With the spermatozoon motion is life, and as long as it lives it moves. When the tail ceases its movements, the organism is dead. The alternate lateral movements of the caudal portion drive the

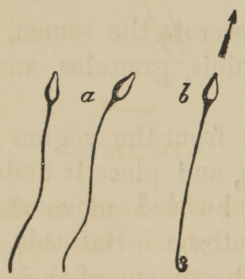

Fig. 136.

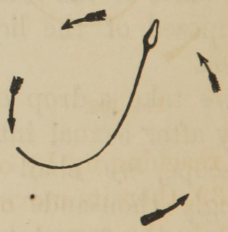

Fig. 137.

head forwards. If by any accident this be injured, then the movements of the body or head are in accordance with the nature of the power exerted by the injured part.

For instance, if the extreme point of the tail should be curled up, either by an injury or be held so by

inspissated mucus, as is represented in fig. 136, *b*, then the movements of the spermatozoon will be in a straight line, as shown by the arrow. If the injury be such as to give a permanent gentle curvature to the middle of the tail, as shown in fig. 137, then its movements will be in a circle, because the extremity drawing constantly against the resisting fluid always in one direction, will, of course, drive the head always in a corresponding direction. For instance, if the tail be permanently turned to the left, as here represented, then, with every contraction of it, the head will be driven round to the left; and if to the right (fig. 138), then it will turn in a circle to the right. But when we find a spermatozoon injured so as to be doubled on itself in the middle, with

Fig. 138.

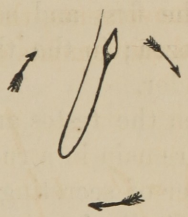

Fig. 139.

the tail reaching up by or beyond the head, as shown in fig. 139, then its movements will be in the opposite direction to the curvature, because the moving power will be expended at the very end of the caudal portion, and this force necessarily drives the head in an opposite direction.

Spermatozoa cease to move only when life is extinct. Under favourable circumstances, they live many hours; but under unfavourable circumstances they die quickly. For instance, any great variation in temperature is fatal to their existence.

For impregnation, the semen must contain living spermatozoa. It has been pretended by some that it may take place without them. They are to be found in all animated nature. I should as soon think of conception without the presence of semen, as to suppose it possible without spermatozoa.

A short time ago it was generally supposed that sterility was a thing that belonged almost wholly to the opposite sex. Mr. Curling* has recently brought this subject prominently before the profession, and has established very conclusively that sterility in the male does positively exist, and that it may depend upon—

1st. Congenital malposition of the testes.

2nd. Chronic inflammation of these glands; and

3rd. Stricture.

In the first and second, the testes fail to produce spermatozoa; in the third, the semen regurgitates into the bladder.

When the testes are retained in the abdomen, they seem to remain in a rudimentary state, and never attain the power of secreting semen with spermatozoa.

Mr. Curling's admirable paper contains a number of cases illustrating this fact, and he arrives at the very just conclusion that the semen of such testes being devoid of the fructifying principle, is wholly incapable of procreation. Mr. Curling says that Mr. Poland and Mr. Cock have each seen cases of procreation where the testes never descended into the scrotum; but in neither of these cases had the semen been examined microscopically. The inference in both instances is

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* "Observations on Sterility in Man," with cases. By T. B. Curling, F.R.S., Surgeon to the London Hospital, &c. Reprinted from the *British and Foreign Medico-Chirurgical Review*. April, 1864.

plain: either that there are exceptions to the rule that a retained testis does not furnish spermatozoa; or that the claims to paternity in their cases were entirely out of the question. The latter the most probable, as there are no facts to substantiate the former.

In the French school this subject has been very thoroughly investigated. The writings of Goubaux, of Follin, of Gosselin, and Godard, all go to prove that a retained testicle is, as a rule, whether in man or animal, incapable of producing spermatozoa, and that semen without spermatozoa is incapable of procreation. In some instances, one testis has been found in the abdomen, and the other in its normal position in the scrotum; and here, the one has invariably been deficient, and the other prolific in spermatozoa.

But while the presence of spermatozoa is essential to fecundation, their absence has no sort of influence upon impotence. By impotence, we understand an incapacity for copulation; by sterility, an incapacity for fructification. Thus a man may be impotent and not sterile; and sterile but not impotent. I have known many men who performed the act of coition with the greatest vigour, whose semen was perfectly devoid of the slightest trace of spermatozoa; and on the other hand, how often do we encounter those who are incapable of the least effort at copulation, but whose semen is loaded with spermatozoa. In the first class, ignorance of their real condition is bliss; while in the second, the certain knowledge of their infirmity produces the greatest misery.

The seminal fluid may be destitute of spermatozoa in consequence of an obstruction of the excretory ducts of the testes. This is the result usually of acute inflammation of these organs. Gonorrhœa has been regarded

as a disease of no very serious importance; but when we see it often producing a double orchitis, which may leave the subject of it sterile for ever afterwards, we should look upon it rather as an affection likely to be attended with the most disastrous consequences.

I now call to mind three young men whom I treated for double orchitis, following gonorrhœal inflammation, about twenty-five years ago, which left in each a chronic double epididymitis. They have been married many years without issue. It is true their wives may have been sterile. On this point I cannot do better than to quote from Mr. Curling,* who says:—

"In 1853, M. Gosselin made known some curious researches in relation to this subject. He carefully examined the semen in twenty men who had been attacked with double epididymitis after gonorrhœa. In fifteen of these cases which were comparatively recent, a callosity existed in the tail of the epididymis at the time they seemed to be cured. In all, the genital functions appeared fully restored and the sperm normal. The semen was repeatedly examined at intervals of several weeks, but no spermatozoa were detected. M. Gosselin lost sight of all but two cases, and in these the return of spermatozoa in the semen occurred after some months, and coincidently with the complete disappearance of the induration in the epididymis on one side. In the remaining five of the twenty cases the double epididymitis had occurred several years previously. One man, aged forty-five, had been attacked twenty years before, but the left callosity no longer existed, and spermatozoa were found in the semen. In another man the disease dated back five years, and had left a

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* *Loc. cit.*

considerable induration at the lower part of each epididymis. The general health was good. No spermatozoa could be detected. In the three other cases the disease had occurred ten, six, and four years before. There was hardness on both sides. The testicles were otherwise unaltered. The indications of virility were quite satisfactory, and the semen presented its usual appearance. The individuals had all been married several years, but had no children. The sperm was carefully examined and found destitute of spermatozoa. One of them had had children by a former wife before the attack of double epididymitis. Since the publication of the preceding observations, M. Gosselin has met with two cases of men who, after suffering from bilateral epididymitis during their youth, had retained an induration on each side. They had been married several years and had no children. In both the virile powers were not, apparently, weak, but the sperm was entirely wanting in spermatozoa.

Thus it will be seen that inflammation of the testes is a matter of grave importance. And this is so whether it be the result of specific causes, of accident, of cold, or of translated parotitis. I have known one case of epididymitis from mumps, where the testes lost the power of generating spermatozoa. It is a curious and fortunate circumstance that epididymitis, by whatever cause produced, in no way weakens the sexual appetite, or the power of gratifying it.

Semen destitute of spermatozoa has the usual sui generis odour, but lacks the appearance of uniformity that belongs to the normal secretion. When viewed by a transmitted light, we usually see little whitish flakes of mucus floating through it. But I have seen two instances in which it had the colour and appearance

of good semen, although wanting spermatozoa. It is insoluble in hot or cold water, and floats about in it immiscibly in cloudy flakes like ordinary mucus. It is more translucent than good semen, less milky, and less opaque. Under the microscope it presents the appearance of ordinary mucus. I have seen samples of semen full of spermatozoa, but loaded with mucus, which probably came from the glandular apparatus at the neck of the bladder. I know of one case illustrating the fact that a man is not necessarily sterile because his semen possesses too large a proportion of mucosity.

Normal semen will drop from the end of the syringe in drops as easily as water. A small quantity falling into a glass of water is, by slight agitation, immediately diffused or dissolved in it. Abnormal semen full of mucus will not leave the mouth of the syringe quickly or suddenly, but ropes off for an inch or more before it breaks into a drop; and when it falls into water it preserves its tenacity, and but a small part of it is dissolved. It floats about in shreds, and eventually settles at the bottom of the glass in the form of a whitish sediment.

Sometimes sterility in the male depends upon a stricture obstructing the outward passage of the semen, which consequently in the act of copulation regurgitates into the bladder. This condition of things is, of course, curable by the proper treatment for stricture.

At the beginning of this section I said that, to ensure conception, "semen with living spermatozoa should be deposited in the vagina at the proper time."

It is the vulgar opinion, and the opinion of many savants, that, to ensure conception, sexual intercourse should be performed with a certain degree of complete-

ness, that would give an exhaustive satisfaction to both parties at the same moment. Even Roubaud* has devoted many pages to the consideration of frigidity in the woman. How often do we hear husbands complain of coldness on the part of wives; and attribute to this the failure to procreate. And sometimes wives are disposed to think, though they never complain, that the fault lies with the hasty ejaculation of the husband. Both are wrong.

God has given us appetites and desires, and endowed the act of copulation with a pleasurable erethism, simply that we might be forced to "multiply and replenish." But for this, the human family might, long ago, have been numbered with the fossils that represent extinct species. No; it matters not how awkwardly and unsatisfactorily the act of coition may be performed, so that semen with the proper fructifying principle be placed in the vagina at the right moment; and, on the contrary, it matters not how perfectly and satisfactorily it may be done, if the semen lacks this fecundating power. I have known many men who knew but little of mere animal sensuality, and whose wives knew less, and yet they were blessed with large families; and, on the contrary, I have known some who were differently constituted, and yet they were perfectly sterile.

It might be thought that I am here overstepping the bounds of propriety, even in a work purely surgical; but I justify myself by the fact, that a false philosophy has gained almost universal credence; and that young medical men, with a correct knowledge of facts as

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* "Traité de l'Impuissance et de la Stérilité chez l'Homme et chez la Femme." Par le Dr. Félix Roubaud. Paris: J. B. Baillière. 1865.

they truly exist, may do much to render many families happier, by setting them right on a point of more vital importance to domestic happiness than many of us have ever dreamed of.

Let us turn to pages 331 and 332, and read over the cases in which conception took place while the wives were etherized, and ask ourselves what agency mere sensual enjoyment could have had in bringing about the result. Our literature furnishes many cases where the seminal fluid has been lost at the mouth of the vagina; where the hymen has remained intact; and where, nevertheless, conception readily occurred.

I have seen cases of this sort; so has Sir Joseph Olliffe; and so has Dr. Campbell, of Paris. Most of these were cases of vaginismus, where the pain and spasm of the sphincter vaginæ were such as to preclude penetration, and the semen was lost at the ostium vaginæ, a little passing through the hymen.

M. Tardieu,* Dean of the Faculty of Paris, relates a remarkable instance of conception following lascivious titillations under most unnatural and unfortunate circumstances. Here the semen was habitually lost at the ostium vaginæ, with the belief that conception could not occur unless the act of coition was fully consummated. But the sequence proved otherwise; and M. Legrand, who delivered her, found the young girl's vagina virginal.

I once requested the husband of a lady who had vaginismus, to let me see his wife an hour after sexual intercourse, for the purpose of determining whether any semen ever entered the vagina. He had not attempted

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* "Etude Médico-légale sur les Attentats aux Mœurs." Par Ambroise Tardieu, Professeur, &c. Paris: J. B. Baillière et Fils, 1859, page 99.

it for ten days or more, and he said he was so nervous at the idea that he lost the semen at the moment of contact, and hence the effort amounted to nothing.

In consequence of this accident, I did not see the patient at the appointed time; but visited her a few hours later for some other purpose, and removed about ten drops of clear translucent mucus from the canal of the cervix. The attempt at copulation was made at eight a.m., the patient did not rise from bed till eleven. At twelve I saw her, and then removed the cervical mucus. I intended to make a microscopic examination of it at once, but circumstances put it out of my power, and I did not do this till midnight, being twelve hours after its removal, and sixteen hours after the attempt at intercourse.

In this cervical mucus I found a solitary spermatozoon, which manifested the greatest activity. I examined the whole of the ten drops of mucus, but could not discover another one, nor was there any in the vaginal mucus. How did only one spermatozoon and no more find its way into the canal of the cervix? Perhaps not more than a drop, or half a drop, of semen passed through the little hymeneal opening. The patient lay in bed three hours afterwards. During this time this stray spermatozoon had travelled three inches and a half from the hymen to the os tincæ (for the vagina was very long and narrow), and had entered into the canal of the cervix, while the remainder of the seminal fluid passed off in resuming the erect posture. The case is curious, as showing—

1st. That semen can be thrown into the vagina without penetration.

2nd. That a spermatozoon can, in a comparatively short time, move over a considerable distance; and

3rd. That it can live a long time out of the body, provided the temperature is not too low. This observation was made on one of the hottest days in July.

We know very well that the semen, or rather its fructifying principle, the spermatozoa, must pass into the cavity of the uterus, if not further, to render conception possible. How is this done? Does it enter the canal of the cervix in the act of ejaculation? or do the spermatozoa afterwards, by their locomotive powers, gradually wend their way up the canal of the cervix?

I am not aware that any observations on the living subject have before been made upon this point. A few *post-mortem* examinations, made in cases of sudden death after coition, have demonstrated the presence of spermatozoa in the cavity of the uterus; but this does not settle the questions raised above. The fact that pregnancy has frequently occurred without penetration, proves very conclusively that the spermatozoa can and do traverse the whole length of the vagina; that they then can and do enter the canal of the cervix, and passing along this narrow strait, that they can and do pass on till they reach the ovum, and fertilize it. But this is not the usual way in which this is done.

I have over and over again examined the condition of the uterus after coition, and often in four or five minutes after it; and I have usually found the state of things described on page 348. I have also frequently removed the mucus of the cervical canal immediately after sexual intercourse, first a drop from the os tincæ, and then a drop or two from an inch higher. If the neck of the womb is in a normal condition, with an open os tincæ filled with healthy mucus, we shall always find spermatozoa in it, in greater or less numbers, if we examine it immediately after coition.

Thus we see that they enter the cervix, as it were, suddenly. My explanation of this physiological phenomenon is, that the cervix is pressed forcibly against the glans by a contraction of the superior constrictor vaginæ; that this pressure necessarily forces out the contents of the canal of the cervix; that the parts subsequently become relaxed, the uterus returns suddenly to its normal condition, and the seminal fluid filling the vagina, necessarily rushes into the canal of the cervix by a process similar to that by which a fluid would pass into an India-rubber bottle slightly compressed, so as to expel a portion of its contents before placing its mouth in a fluid of any sort.

If the uterus is in a normal condition, we shall always, as a rule, find spermatozoa in the canal of the cervix immediately after coition. If the uterus is greatly retroverted, we shall not; and if it is greatly anteverted we shall not. And why? Because, in the first instance, the os tincæ will be too close to the symphysis pubis, and if it is subjected to any such pressure as that alluded to above, it will, for anatomical reasons, be such as to compress the posterior lip of the os tincæ up against the anterior, which will have no effect in exhausting the canal of the cervix; and in the second instance, where there is a complete anteversion, with the os looking in the direction of the hollow of the sacrum, the same act and the same pressure would only force the anterior lip of the os tincæ up against the posterior, creating no vacuum, and making no room for the newly introduced fluid.

From this it will be seen that I believe the cervix uteri to be shortened in the erethismal climax of coition, by pressure exerted upon it in the direction of its long axis when its position is normal, which is impossible in

any greatly abnormal position. I have spoken of a superior constrictor vaginæ, and attributed to it a certain office—that of compressing the glans forcibly against the os tincæ at a certain moment. I have made no dissections to prove the existence of such a special muscle; but that it does exist, and that some anatomist will dissect and describe it, I feel perfectly confident, for I have seen the manifestations of its presence hundreds of times. In uterine examinations with the patient on the left side and my speculum introduced, we may now and then see the posterior wall of the vagina just opposite the os tincæ gradually contracted and corrugated, till it is brought almost in contact with the cervix, evidently by circular bands of muscular fibres that occupy the superior portion of the vagina.

We are more apt to see this in patients that are alarmed, and manifest some degree of general nervous agitation. I have witnessed this over and over again, and what one man sees another will be sure to discover when his attention is turned in the proper direction. It matters not whether this explanation is correct or not, provided other observers establish the fact that the semen finds its way at once into the canal of the cervix.

We have already discussed many of the mechanical obstructions that prevent the passage of the semen to the cavity of the uterus; and we have seen that the great difficulty is to be found almost uniformly in the cervix.

It has, hence, occurred to many philosophic minds, to overleap this barrier at once, by throwing the fructifying agent right into the cavity of the uterus. But the practical execution of this is surrounded by many difficulties. For instance, how delicate and difficult

would it be to arrange everything preparatory to such a procedure. Then, as to the temperature of instruments; for the slightest variations of this, whether of heat or cold, are inimical to the life of the spermatozoa. Then as to the quantity of semen to be introduced, whether much or little; the delicacy of the apparatus for this, and the proper time for the operation. When all these circumstances are taken into consideration, we can appreciate the difficulties of the practical execution of a thing that would at first appear to be theoretically so simple Ever since the days of Spallanzani and Rossi, who, with a syringe, injected the semen of the dog into the vagina of the bitch, and saw impregnation follow, it has been supposed by many that in the human subject this mechanical process might be carried still further, by injecting the semen into the cavity of the uterus from the canal of the vagina. But I know of no published account of any experiments of this sort.

Some years ago, I made a series of this kind, and actually saw conception follow this process in one instance. Dr. George Harley, Professor, &c., in University College, London, informs me that he has repeatedly performed the experiment of injecting the semen into the cavity of the uterus, but with no result. I have given up the practice altogether, and do not expect to return to it again; but as others may feel disposed to try further experiments in this direction, I shall here give them the advantage of my experience.

Before undertaking this we must satisfy ourselves that the semen is perfectly normal, and that it does not and cannot enter the canal of the cervix in the natural way.

In all my cases there was a contraction of the canal

of the cervix, and in two there was quite a flexure at the os internum; and experimental observations proved that the semen never entered the canal of the cervix in any one of them. In all of them the operation of incising the os and cervix would have been the proper course to pursue; but my patients were too timid, would not submit to it, and accepted the uncertain alternative of uterine injection. In my first experiments this was often more painful than any operation, for it frequently produced severe uterine colic. I had no data to guide me, and I began by slowly injecting three or four drops of the seminal fluid, which produced very severe symptoms; then two drops, and then one, till finally I determined that half a drop was quite enough. Indeed, I have no idea that this quantity ever gets into the cavity of the uterus in Nature's own way, and I now wonder why I should have begun these experiments in such a heroic manner. Suffice it to say that I have seen conception follow this artificial fructification once, and once only. The case is of sufficient importance to give it in detail.

My patient was twenty-eight years old; had been married nine years without issue; and had had more or less dysmenorrhœa all her menstrual life. It was often attended with great constitutional disturbance, such as nausea, vomiting, and sick headache. She had retroversion, with hypertrophy of the posterior wall, an indurated conical cervix, a contracted canal, which was particularly contracted at the os internum, in consequence of the flexure incidental to the malposition; and superadded to all these mechanical obstructions, the vagina never retained the semen. I examined this case several times very soon after sexual intercourse, and I never found a drop of semen in the

vagina, although it was placed there in the greatest abundance.

This patient was willing to submit to anything but a surgical operation. Could any case have presented a greater number of difficulties to be overcome? The first thing to be done was, of course, to rectify the malposition, and to keep the uterus in its normal relations by means of a properly adjusted pessary, with the hope that the vagina would retain the semen. This point has been so fully discussed in Section V., that it is unnecessary to say more here than that I fortunately succeeded in doing this, and a sufficient quantity of semen was retained, though the most of it passed off. This part satisfactorily arranged, we were now ready for the uterine injections. These extended over a period of nearly twelve months. Some of them (two) were made just before menstruation; the others (eight) were made at different periods, varying from two to seven days after it ceased. Beginning with three drops, I at last injected half a drop.

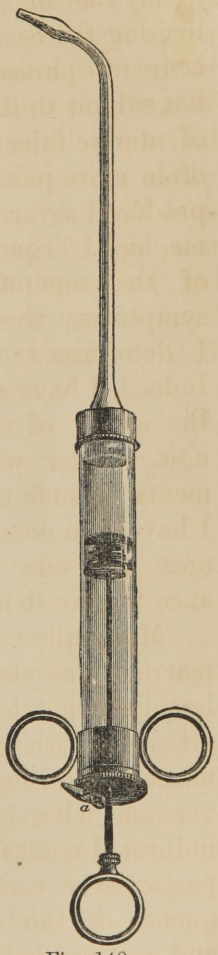

Fig. 140.

Fig. 140 represents the instrument with which these experiments were conducted, with the exception of the bulb at the end of the tube. It is made of glass. The

piston can be drawn out easily for the purpose of taking up the semen; but for the purpose of graduating exactly the quantity to be injected, there was a little screw nut, *a*, which could be turned against the piston-rod, upon which a screw was cut. This prevented the piston from being forced down, except by the action of the screw. When we wished to force out the contents of the syringe, half a revolution of the piston forced out half a drop, a whole revolution a whole drop, and so on, just as does Pravaz's instrument for the endermic injection of morphine. The greatest care was necessary in managing the temperature of the syringe. I placed it in a bowl of warm water, with a thermometer to mark 98° Fah., taking care to have it no more and no less. But as the removal of the instrument from the bowl of water to the vagina would be necessarily attended with a diminution of temperature, I adopted the plan of allowing it to remain about a minute in the vagina before drawing up any of the semen into it; and this for the purpose of insuring it to be the same temperature as the fluid in which the spermatozoa disported.

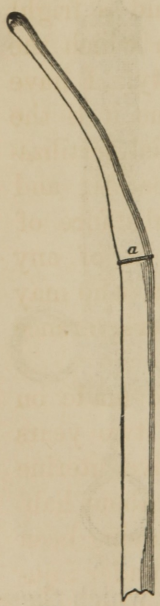

FIG. 141.

Fig. 141 represents the exact size of the glass-tube, used the last time in this case; *a* is the point at which a string was tied, as a guide and a guard to prevent its being introduced too far into the cavity of the uterus. This was exactly one inch and nine-sixteenths from the end, which I think is quite as far as we should introduce the instrument. Thus it was not carried so far as to injure the lining membrane of the

uterus, or to mar the vitality of the ovum, if it had already reached this cavity. I feared that I might have done one or both of these in some of my earlier experiments. In this particular case, about four drops of semen were taken up; the instrument was cautiously carried into the canal of the cervix, till the point was in close contact with the os tincæ; then the piston-rod was slowly turned half a revolution, which as slowly forced out half a drop of semen; the instrument was held *in situ* for ten or fifteen seconds and then withdrawn, and the patient lay quietly in bed for two or three hours afterwards.

Under these circumstances, at this, the tenth trial, conception took place, and everything went on favourably till the fourth month, when a fall and a fright unfortunately produced a miscarriage, from which the mother recovered with the greatest difficulty. I have related this case minutely, because I presume it is the first and only authentic case in which artificial fertilization has been successful in the human species; and because it furnishes about the sum and substance of my knowledge on the subject which may be of any possible service as a guide to future observers, who may have the curiosity, leisure, courage, and perseverance to experiment further in this direction.

The experiments above alluded to were made on half a dozen different patients. During the two years that I was engaged in them, I made fifty-five uterine injections. I think I am entitled to subtract about half the number as having been badly done, or having been made with badly constructed instruments, or under injudicious circumstances. If so, then they show one conception out of about twenty-seven trials. I have very little doubt that we shall learn still more about embryology;

and some years hence, when we shall better understand the laws of conception, I doubt as little that some one will be able to apply the principles sought to be established by these experiments with more exactitude than I have. If we understood more about the proper period for conception, this mechanical fertilization might become exact enough to depend upon it in such cases as would be otherwise impracticable.

Science, even in our own day, demonstrates now and then the wisdom of laws given under the Mosaic dispensation. As an instance, I have only to refer to the recent discovery of Trichinæ in swine, as showing not only its occasional unfitness, but its positively poisonous qualities as an article of diet under some circumstances. Then, again, the laws bearing on the uncleanness and the purification of women in menstruation, are in accordance with the accepted doctrines of the day, in regard to the period of fitness for conception. "But if she be cleansed of her issue, then she shall number to herself seven days, and after that she shall be clean." —Levit. xv. 28.

It is pretty well established that menstruation is the sign of ovulation; that it is preparatory to the reception of the ovum; that the ovum reaches the cavity of the uterus in from two to ten days after menstruation; and that it must be fertilized at some point between the ovary and the os internum, by coming in contact with the spermatozoa. Dr. Ritchie* of Glasgow believes, with many other modern Physiologists, that the uterus itself is the normal seat of conception.

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* "Contributions to Assist the Study of Ovarian Physiology and Pathology." By Charles G. Ritchie, M.D., &c., &c., p. 101. John Churchill & Sons. 1865.

Now, if all this be so, it follows that the best time to insure this fructification is within the ten days following menstruation. This is the generally accepted doctrine in regard to the most fitting time for conception. I have no doubt that conception may take place at any period whatever, relatively to the return of menstruation; but there is hardly a question that it occurs more frequently within the ten days following this period. I know of several instances in which it undoubtedly occurred within the week preceding the expected return of the flow.

Sir Joseph Olliffe and I sent a patient of ours to Spain, in the spring of 1864. She had been under treatment for menorrhagia for three or four months, and lived entirely apart from her husband during the whole of this time. They were ordered to live apart till she should pass over one period in Spain. Everything went on according to our prescription till about forty-eight hours before the expected appearance of the flow, when by accident, as sometimes happens, the injunction of the doctors was momentarily forgotten, and the period did not come at the expected time. Indeed, she conceived, and in due time was delivered of a daughter.

The husband of a lady of great eminence, aged thirty, the mother of three sons, the youngest three years old, was absent in the Holy Land for five months, and returned exactly five days before the expected recurrence of his wife's menses. He spent but one night at home, being suddenly called off for several days by some urgent business. His wife conceived, and bore him a daughter.

I had a lady, aged twenty-eight, nearly two months under treatment for some cervical disease. The case was treated entirely with tampons of cotton-wool, wet

with glycerine, holding in solution various remedies, such as tannin. When she was thought to be well enough to return home, her husband came for her. I wished to see if the secretions were normal. Sexual intercourse took place, at my request, two days before the expected return of menstruation. It did not appear. She had conceived, and in due time a son was born.

I can vouch for the reliability of the parties alluded to above. I have related these three cases to illustrate the fact, that conception can and does take place just on the eve of the approach of menstruation; a thing, by the bye, that is not denied. I could give several reliable cases where the circumstances were such as to prove that conception could only have occurred within a week or ten days following the cessation of the flow.

When I was engaged in the philosophic experiments of artificially introducing the semen into the cavity of the womb, I had to make some fifteen or twenty essays before I was satisfied of the quantity of semen to be introduced, but as to the proper time for this I never felt entirely sure. For those who are very anxious for offspring, I usually order sexual intercourse on the third, fifth, and seventh days after the flow has ceased; and on the fifth and third before its expected return; and but once on each day. For the most obvious reasons this should always be on going to bed at night, instead of just before rising in the morning. The horizontal posture favours the retention of the semen; the erect its expulsion. I am satisfied that too frequent sexual indulgence is fraught with mischief to both parties. It weakens the semen. In other words, this is not so rich in spermatozoa after too great indulgence; and when carried to the extent of a debauch, the fluid ejected may be wholly destitute of spermatozoa. Thus it will be

seen that it is much better to husband the resources of both man and wife. The sexual act should never be done except at the spontaneous prompting of nature. It is very curious to contemplate the bounties of nature when we come to view the provisions made for fructification, whether in the vegetable or animal kingdom. We know that but little semen and but few spermatozoa are needed for fertilizing the ovum. We see this in pisciculture, and we may infer it in all creation. I do not know that any one has ever thought of measuring the quantity of semen ejected in the act of copulation, nor do I know that it would be possible to arrive at this point accurately; but accident led me to make some observations on this subject, which I here place on record as a matter of physiological interest, if not of therapeutical importance.

In most women a considerable part of the semen passes off with the completion of the copulative act, and the separation of the sexes, while a large part of it remains in the vagina to gradually ooze away. It has so happened that I had two patients whose vaginas seemed to hold almost all that they received. It has been my duty to examine them a few minutes after coition, and the perineum and nates appeared to be almost as dry as if nothing of the kind had taken place. The quantity of semen retained by the vagina seemed to me to be so great, that I was induced on several occasions to remove it with a syringe, and to measure it subsequently, and I found that ordinarily there was about a drachm and ten minims. Of course, this did not comprise all that was deposited there, for a very considerable portion must of necessity always be removed by the male, merely by the attraction of cohesion.

It would be important to determine how long sper-

matozoa can live in the matrix. On this point we need more extended experiments, for I do not think that their duration of life has yet been fully established. Dr. S. R. Percy,* of New York, reports a case in which he found "living spermatozoa, and many dead ones," issuing from the os uteri, eight and a half days after the last sexual connection. During this time the husband of the patient had been from home.

I have examined the semen many times with the view of determining this point, and think I can safely say that spermatozoa never live more than twelve hours in the vaginal mucus. But in the mucus of the cervix they live much longer. At the end of twelve hours, while all are dead in the vagina, there are but few dead ones to be found in the cervix. When the cervical mucus is examined from thirty-six to forty hours after coition, we shall ordinarily find as many spermatozoa dead as alive. But my observations on this point could not, under the nature of things, be accepted as the rule, for they were all made upon those who were, or had been, the subjects of uterine disease in some form or other.

Here is the report of an observation made upon a patient who is perfectly reliable:—"Sexual intercourse at eleven p.m. on Saturday. A microscopic examination of the secretions was made on Monday, at three p.m., just forty hours afterwards. The vaginal mucus contained a few dead spermatozoa—none alive; the cervical mucus contained great numbers very active—a few dead."

The above is copied from notes made at the time. I saw no reason why many of these active spermatozoa should not have lived for a still longer time. Many of

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* *American Medical Times*, March 9th, 1861.

them lived six hours after their removal. This was in July.

Before closing this subject, I shall give a few examples illustrating the best time for sexual congress after menstruation, to insure conception.

A menstruation took place on the 7th and ended on the 10th of the month. Sexual intercourse happened once on the 11th. On the morning of the 12th, the lady went to a sea-side watering-place, where she remained more than a month, leaving her husband at home. She had always been regular, but her period did not appear on the 5th of the following month as she expected. Fearing that the sea-bathing had something to do with the non-appearance of the menses, she sent for a physician, who ordered her to stop the baths, and gave her some strong emmenagogues to provoke the flow, but it did not come. The next period passed, and it was found, greatly to her surprise, that she was pregnant. She went the full time, and a son was born.

I operated on a lady, thirty years old, who had been married fifteen years without offspring. I directed her to have sexual intercourse on the third, fifth, and seventh days after the cessation of the menses. She menstruated on the 8th of the month, ceased on the 12th, had sexual intercourse on the 17th, and a son was born on the 16th nine months afterwards.

In the case of uterine injection spoken of on page 368, menstruation began on the 2d of the month, finished on the 6th, sexual intercourse took place on the 12th, the uterine injection was only five or six minutes afterwards, and conception dated from that time.

Here, then, is one case where conception occurred on the day after the flow ceased, and only four days from the time it began; another in which it probably took

place five days after the flow ceased, and nine days from the time it began; and another in which it took place six days after the flow ceased, and ten days after it began. I might give other facts like the last two, but I forbear. They accord very well with the received doctrines of the day as to the proper time for conception, viz., about a week, more or less, after the cessation of the flow.

I hope I have said enough to show that, for the purpose of conception, "semen with living spermatozoa should be deposited in the vagina at the proper time."

SECTION VIII.

THE SECRETIONS OF THE CERVIX AND VAGINA SHOULD NOT POISON OR KILL THE SPERMATOZOA.

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The vagina and the canal of the cervix each secrete a mucus peculiar to itself. That of the vagina is acid; that of the cervix very slightly alkaline. These secretions become changed in character and consistence by any inflammatory action set up in the glandular apparatus that gives rise to them. We shall consider their deviations from a normal condition,

1st. Of the vaginal secretions; and

2nd. Of the cervical.

1. The vagina is subject to an inflammatory action, which may arise from a specific cause or not.

Vaginitis is a most troublesome affection; it matters not from what cause it originates. It usually has a specific origin, but it may arise spontaneously; sometimes it is secondary to some irritating discharge from the uterus. Sir Charles Locock* says: "There is one material point connected with leucorrhœa, and especially where the discharge is purulent or of an acrid character. In such instances it is well known that sexual intercourse will often bring on a train of symptoms very much resembling gonorrhœa in the male. This, when occurring between husband and wife, has often led to much domestic unhappiness, from the supposition of one

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* "Cyclopædia of Practical Medicine," article Leucorrhœa.

party or the other having contracted gonorrhœa from impure connection."

I am unhappily able to substantiate fully all that is here stated on this point by this distinguished authority; for I have seen many cases of urethral inflammation in the husband, that were unquestionably contracted from the wife, who, however, had merely a leucorrhœa of an acrid character.

The treatment of vaginitis is now reduced to great simplicity. I have found Demarquay's plan to answer admirably. It consists in introducing a tampon of cotton or lint saturated with a solution of tannin in glycerine, from two to four drachms to the ounce. This dressing may be retained three or four days. According to Demarquay, the average time of treatment by this method is about a fortnight.

Recently Dr. John J. Black,* of the Philadelphia Hospital, Blockley, has made some experiments in the treatment of vaginitis with medicated suppositories that produced most satisfactory results. He experimented with persulphate of iron, alum, tannin, copaiba, and a variety of other remedies, and arrived at the conclusion that the suppository plan of treatment was superior to all other methods in efficiency, cleanliness, portability, and ease of application at any time, and without the aid of instruments. Subjoined is one of Dr. Black's formulæ for their preparation:

℞ Ol. Theobromæ, ʒ xii.
Morphiæ Sulph., gr. vi.
Liq. Ferri Persulph., gtt. cxliv.
Cerat. Adipis, ʒ iij ss.
M Et fiant Suppositoria xii.

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* *American Journal of the Medical Sciences*, No. XCIX. July, 1865, p. 63.

Of these, one is to be introduced into the vagina every other day, except during menstruation. Dr. Black says: "The average number of days required for the cure was as follows:—Liq. ferri persulph., nine days; alum and tannin, nine days and a half; ol. copaibæ, twelve days; comp. iodine ointment, thirteen days; citrine ointment, fourteen days; chloride of zinc, nineteen days." The very strong preparations were inferior to the milder.

This is certainly far better than the old plan by nitrate of silver and vaginal washes, which was always tedious and most unsatisfactory. I do not know that vaginitis, properly speaking, is absolutely opposed to the vitality of the spermatozoa. According to Donné they live in pus and blood, and a variety of other fluids. I have frequently seen conception to happen where the cervix uteri was the seat of profuse suppuration, so that pus, *per se*, is no hindrance of this. The most troublesome obstacle of this sort is to be found, not in the quantity but in the character of the vaginal secretion. This, as before stated, should be slightly acid; if it is very acid it kills the spermatozoa instantly. I have seen many cases in which they were all dead within five or six minutes after coition. In all these cases the vaginal mucus was by no means abundant, but the surface of the vagina always had a reddish look, and its papillæ were prominent.

By simply inspecting the surface of the vagina, and testing the degree of acidity with litmus-paper, I have sometimes been able to say that the vaginal mucus would probably poison the spermatozoa. The blue litmus should be slowly turned to a faint pink when the secretion is normal; but when it is abnormal, the litmus-paper turns quickly to a deeper pink colour. I have seen conception twice where the vaginal mucus poisoned the

spermatozoa. One was remedied by slightly alkaline washes used before sexual congress. In the other it occurred in this way. A lady, aged twenty-eight, was married six years without issue. She had a contracted os. It was incised; but she did not conceive. She had an indurated cervix, the consequence of cystic disease. For this she was under treatment for nearly two months. It was cured; and her husband came to take her home. Wishing to see the character of the semen, I examined the vaginal mucus four or five hours after coition. The spermatozoa were all dead. On the next day I examined them in five or six minutes afterwards, and could not find one alive. I then placed in the vagina a small tampon of cotton moistened with a little glycerine, which held in solution some of the bicarbonate of soda (twenty grains to the ounce). This application was repeated on the next day. The cotton was tied with a string for its easy removal. This was worn from about two o'clock p.m. till eight the next morning. Its removal was followed by connection. Living spermatozoa were afterwards found in the greatest abundance. Indeed, there were no dead ones at all. Conception dated from that moment, being just two days before the expected return of the menses, which, however, did not recur. There had been no sexual intercourse for nearly two months before. Labour came on at the fulness of time; and the delivery was safe.

According to Kölliker, the phosphate of soda is peculiarly favourable to the movements of spermatozoa; and this would probably be a good application in such cases as the above. But as yet I have had no experience with it.

2. Of cervical leucorrhœa.

Dr. Bennet has done much for the treatment of the

diseases of the cervix uteri; and Dr. Tyler Smith's contributions to the Pathology of Leucorrhœa* are of the greatest importance. With these and the comprehensive treatises of West, of Churchill, of Hewitt, and of McClintock now before us, and all fresh from the press, I can here afford to pursue pretty much the same course as that which I have followed all along, viz., to give a few clinical illustrations of merely surgical and manipulatory processes.

Cervical leucorrhœa may be a hyper-secretion from the lips of the os, or from the cavity of the cervix. It is almost always of albuminous consistence, and very difficult of removal. Under the microscope it presents the characteristics of muco-pus. Sometimes it is merely an exaggerated secretion seemingly without any abnormal qualities. It interferes with conception in two ways—mechanically and chemically. Mechanically in blocking up the canal of the cervix, and preventing the passage of the spermatozoa; chemically by poisoning or killing them. I have frequently seen conception happen while using the nitrate of silver for granular erosion of the os and cervix uteri. Unless there is some special reason for it, I never interdict sexual congress during the treatment of ordinary cases of cervical engorgement. Where conception has taken place under these circumstances, I am satisfied that sexual intercourse must have occurred within ten or twelve hours after the use of the remedy, or at least before its eschar began to separate, which is always attended with a secretion of muco-pus that would be fatal to the spermatozoa.

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* "The Pathology and Treatment of Leucorrhœa." By W. Tyler Smith, M.D., Professor, &c., 1855.

Nitrate of silver will probably retain the good reputation it has acquired in the treatment of granular erosions of the cervix. In some cases it unfortunately provokes hæmorrhage, and this is one of the objections to its use. Dr. Wright,* of the Samaritan Hospital, has recently called the attention of the profession to the use of a compound of the iodide and nitrate of silver as they exist in "an old photographic nitrate-bath, still bright and clear, but which had been so long worked that it had become saturated with iodide of silver, and contained a considerable amount of ether." Accident led him to the use of this preparation, and he has found it far more efficacious in the various forms of stomatitis and analogous affections of the uterus than the more concentrated solutions of the pure nitrate of silver. Dr. Gibb has also used it topically with marked benefit in affections of the throat and larynx. This "old bath solution" may be obtained of any respectable photographer.

I know of no caustic application of more value in these cervical engorgements than the chromic acid, as already set forth on page 43.

Potassa cum calce I now seldom employ, and think it should be used with great caution. In the practised hands of such men as Bennet and Tilt I have no fear of it. We know very well that we can by long experience acquire a tact in the management of powerful remedies whereby they are perfectly harmless. Any one must have been struck with this fact who has followed the distinguished surgeon Jobért (de Lamballe) through his wards in the Hôtel Dieu, and seen with what skill

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* *The Lancet*, March 18, 1865, p. 282: "The Topical Use of Silver Solutions." By Henry G. Wright, M.D.

he wielded the potential cautery in the kind of cases that we are now considering.

There are many hypertrophied and granular conditions of the cervix that obstinately resist all local stimulating, or escharotic applications. Scanzoni recommends excision or amputation of the affected portion when this is the case. For many years I have been in the habit of doing this, and have thus often cured cases in a week or a fortnight that had been under treatment for months without improvement.

Vaginal washes are of some importance in the conditions of the cervix that give rise to leucorrhœal discharges. They are to be made with a syringe that is capable of throwing in a sufficient quantity of water without fatigue to the patient. Solutions of alum, of zinc, of lead, of iron, of tannin, and of other astringent remedies, may be used from time to time. We should never use cold vaginal washes. I am sure I have seen great harm produced by them. They are valuable in controlling leucorrhœal discharges, but they favour to a great degree the production of an indurated condition of the cervix, which is to be avoided if possible. Vaginal injections should always be tepid, let them contain what they may in solution.

It has been thought that they could produce but little effect on the condition of the cervix; but this is a great mistake. Remedies thus applied act by osmosis, and produce not only a local, but, in some instances, a constitutional effect. I have often heard patients complain of the taste of tannin a few minutes after its application to the cervix uteri. It might be supposed that this was an effect of imagination, or that the odour of it was confounded with the taste. But this could not be so, when the application was made without

the patient knowing what it was; and if the scent of it was mistaken for the taste, the mother, or aunt, or nurse present would have been as liable to be thus deceived as the patient, which was never the case. I am perfectly satisfied that I have known patients to experience the taste of tannin in the mouth only two or three minutes after it was applied to the cervix uteri.

Great care is necessary in the use of the syringe. How often have I seen vaginal injections given without their ever reaching the posterior cul-de-sac; occasionally not even the anterior. Why any one should ever have made a curved vaginal tube I cannot understand; and yet we find them in all the shops. If a curved tube be introduced into the vagina with its concavity upwards the distal end will strike against the anterior wall of the vagina before it reaches the cervix uteri; if, on the contrary, it be turned backwards, it will as invariably rest upon the posterior wall of the vagina without passing under the cervix, and in either case it fails totally in the object of its use. A vaginal syringe tube should be about the size of the little finger, and full four inches long. The patient should be taught to use it for herself. It should be passed into the vagina, and directed downwards and backwards as if it were to be passed in the direction of the os coccygis. It should be pushed gently on almost by its own gravity, if the patient is in the recumbent posture, till it seems to be arrested by an elastic resistance, which is the posterior cul-de-sac. We shall then know that the end of the tube is under and beyond the cervix uteri.

When we, then, begin to inject the water, we shall feel confident that it will in its regurgitation bring away whatever secretions may be lying in the vagina, whether

high up or low down. We cannot be too careful in our directions about the use of vaginal washes, for if not properly applied they may not only fail to accomplish all that we expect from them, but they may produce most painful if not dangerous consequences. We all know what a serious matter it once was to throw the blandest fluid into the cavity of the uterus; indeed, many of us had altogether given up the practice of injecting this cavity with any fluid whatever till Dr. Savage showed how safe it was after the dilatation of the os internum by sponge tents. The accident that I allude to as sometimes happening from the use of the vaginal syringe is that of suddenly throwing a jet of water forcibly into the cavity of the uterus, which produces a dreadful uterine colic, attended with the most distressing symptoms of prostration. No man who has unfortunately witnessed the perfect collapse following such an occurrence, whether by accident or design, can ever forget the feeling of dread that seized his own soul as he saw his patient launched in a moment from a comparative state of ease and comfort into the very jaws of death, as it were. I have never known any one to die as a consequence of uterine injection, but he is a rash man who runs the risk of his patient's life after once witnessing the painful results of such a thing under the old régime.

The uterine colic accidentally produced by the self-injecting syringe has always happened under my observation in cases of retroversion. In these, the os tincæ presented in the line of the axis of the vagina; the end of the tube entered the open os, and the water was thrown directly into the cavity of the uterus. It is, therefore, most important in cases of retroversion, to teach the patient the art of using the syringe properly

and safely as well as efficiently. To prevent any accident it would be well to close the little hole in the end of the tube, leaving the lateral ones open.

Amongst other vaginal washes for cervical secretions, I must not omit to mention Dilute Hydrochloric Acid. I gave Mr. Swann, of Paris, several samples of muco-purulent albuminoid-looking secretions from the cervical cavity, for experimental observation, and he found that dilute hydrochloric acid was the only chemical capable of dissolving it, that could be used locally as a wash. Where there is no vaginal irritation or epithelial abrasion, this may be used with advantage according to the following formula :—

℞ Dilute Hydrochloric Acid, ʒj.
Distilled water, ʒ vij.
℥

A tablespoonful in a pint of tepid water to be thrown into the vagina night and morning.

But vaginal injections are only adjuvants of treatment. We cannot depend upon them wholly for curative results. They are valuable in their way, and not to be ignored. I know of nothing more difficult of cure than an old cervical leucorrhœa; and notwithstanding the vaunted success of this or that remedy, I fear that the young practitioner will often be disappointed in their application.

Professor Courty, of Montpelier, foiled in the treatment of cervical leucorrhœa by the ordinary routine, resorted to the expedient of leaving a bit of nitrate of silver in the canal of the cervix for several days, and describes good results from it. Dr. Simpson has lately been applying various remedies in the vagina in the form of suppositories, made of the butter of cocoa. I have

recently had made little suppositories of cocoa butter, an inch and a quarter long, and small enough to pass along the cervix, medicated with various remedies so as to bring these into permanent contact with the diseased surface. For instance, I have had them made, containing severally morphine, atropine, alum, tannic acid, persulphate of iron, &c., in appropriate doses, and think they promise very satisfactory results.

A very convenient way of applying remedies topically to the cervix uteri is that introduced, I believe, by Kiwisch, of using a tampon of cotton or lint, saturated with a solution of the remedy to be so used. I have for a long time adopted this plan, and have every reason to be satisfied with it.

If I were asked what next to mere mechanical obstruction of the cervix uteri constitutes the greatest obstacle to conception, I would have no hesitation in saying that it was an abnormal secretion from the cervix.

We often see the cervical mucus in such large quantities that its mere abundance will mechanically prevent the passage of the semen to the cavity of the uterus. Sir Joseph Olliffe has informed me of the case of the wife of a medical man, who had been sterile for many years, and whose cervix uteri always presented a little mass of ropy mucus hanging from the os that obstructed mechanically this canal. At last, the doctor had the rational surgical idea to exhaust the cervix of its inspissated mucus, and sexual congress with his wife immediately afterwards was followed by conception.

I knew but little about the effects of the mucous secretion of the vagina and the cervix upon the vitality of the spermatozoa until within the last three or four years; and I am now satisfied that the cervical secre-

tion is often poisonous to the spermatozoa, even when it would seem to be almost normal in appearance. This must depend upon some other quality than mere alkalinity, for I have often found all the spermatozoa in the cervical mucus dead while it manifested no unusual degree of alkalinity when tested by litmus-paper. But when placed under the microscope it showed an uncommon number of epithelial scales. This demonstrated an abnormal action in the glandular apparatus that gave rise to this secretion, which seemed to kill the spermatozoa more by its density than by its chemical action; for I have noticed that they lived longer in that portion of the mucus that had the fewest number of epithelial scales; and, vice versâ, died quicker in that portion that had the most; and that, too, when litmus-paper showed no difference in the chemical character of the two.

In these cases, in almost every instance after the use of a sponge-tent, for six or eight hours I have been able to detect by the sense of touch a small gristly growth at some point in the course of the canal of the cervix that was evidently the seat of this abnormal hypersecretion. Sometimes this is confined to a single spot; again, it may be spread over a surface of greater or less extent. Occasionally the whole of the lining membrane of the canal may be a muco-pyogenic surface. What are we to do when this is the case? As said before, I know of nothing more difficult to remedy. Professor Courty's plan of prolonged cauterization may hold out some hopes of a cure; or the method of intra-cervical suppositories already alluded to may be of service. But I am disposed to believe that we shall do better by ignoring caustics and caustic applications altogether, and resorting to some method of modifying this secretory

surface by pressure. My countryman, Professor Byford* speaking of Endocervicitis, says: "A bougie of slippery elm large enough to fill the cervical cavity, introduced as high as the inflammation extends, and allowed to remain for twenty-four or thirty-six hours, not only prepares the way for other applications, but favourably modifies the disease by its pressure upon the capillaries. The use of the stem pessary proves beneficial too, I think, in some instances, on account of the stem pressing upon the inflamed part inside the cavity of the cervix, and thus changing the character of the capillary action."

I am quite prepared to accept Professor Byford's teachings on this point, for I have known many cases of conception to follow the use of the intra-uterine stem, and I have now but little doubt that its curative action was more in relieving that condition of the cervical membrane that gave rise to abnormal secretions, than in merely mechanically dilating the os internum.

I have, in the early part of this volume, objected to the use of the intra-uterine stem; but there is a modification of it by Dr. Greenhalgh that I have occasionally used with good results. Its advantage over its prototype is, that it is tubular and self-retaining. It allows the secretions from the cavity of the uterus to pass through it, and at the same time it is not so liable to slip out.

Fig. 142 represents the instrument of full size. It is from two to two inches and an eighth long. It is introduced with the wings drawn into a straight line by means of a stilet, as shown in the figure. As soon as

* "The Practice of Medicine and Surgery, applied to the Diseases and Accidents incident to Women." By Wm. H. Byford, M.A., M.D., Professor, &c. Philadelphia: Lindsay & Blakiston. 1865. Page 262.

it is passed to the requisite depth, the stilet is withdrawn; the wings spring back within the cavity of the uterus; the os internum grasps the instrument at its bifurcation, and the lower end rests against the os tincæ. Of course, this instrument can only be used after an incision of the cervix or a dilatation of it by a sponge or a sea-tangle tent. It may be made of steel and silver plated; but I prefer it of vulcanite.*

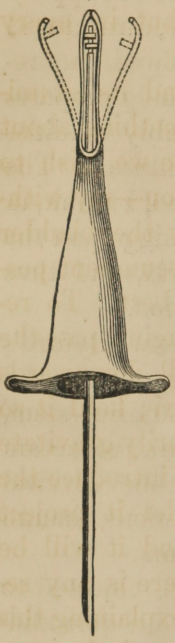

Fig. 142.

I have seen cases in which this instrument was worn with great comfort; and again I have seen others that could not tolerate its presence for a moment. In these last we shall find the cause of intolerance to be an endo-metritis which had not, perhaps, been suspected before. Dr. Coghlan's† plan of using a tube of sheet-lead I have found to answer a very good purpose.

I have not been able to arrange any apparatus for withdrawing in an isolated form the secretions of the cavity of the uterus for microscopic and chemical examination. It is highly probable that this will be done at some time or other, and we shall then be able to determine more about the condition of its secretions as influencing the life or death of the spermatozoa. We have already made great advances in studying the effects of the vaginal and cervical secretions upon them;

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* Made by Mayer, of Great Portland Street; also by Weiss.

† "On Dysmenorrhœa and Sterility; with Wood-cuts of New Instruments." By John Coghlan, M.D. *Medical Times and Gazette*, 1861, '62, and '64.

and I belong to that sanguine class of medical men who look forward with great hope to enlarged views and more certain methods, not only in this but in every department of medicine.

I have said a good deal about semen and its examination, and it is time that I should say something about the measures preparatory to this. Suppose we wish to examine the vaginal mucus soon after coition—say within an hour; we direct the patient to empty the bladder before the act, and to retain quietly the recumbent posture after it. The dorsal decubitus is the best. To remove a few drops of the contents of the vagina, pass the index finger into it, press the posterior wall downwards and backwards, just under the cervix uteri; hold it so for a minute or two; the semen will necessarily gravitate to the pouch made by this pressure; then introduce the nozzle of the syringe along the finger; let it project slightly over the end of the finger-nail, and it will be easy enough to obtain what we want if there is any semen in the vagina. I am thus minute in explaining this simple operation, because we may fail in it entirely, even when the vagina contains large quantities of semen, if we neglect these minutiæ. And in this way. If we pass in the syringe in a haphazard manner, and begin to draw the piston, the mucous membrane of the vagina is sucked up into the end of the tube, and thus it is possible for us to slide it around in various directions, without getting a drop of mucus of any sort. But suppose we fail even with properly directly efforts; then the left lateral position and my speculum will in a moment show us the whole of the contents of the vagina, and we can with the syringe remove what we want.

When we wish to examine the cervical mucus, we should resort at once to the speculum and the proper

position. It is well enough, then, to sponge away all the mucus from the vagina, and especially from about the cervix uteri. We then pass the nozzle of the syringe just within the os tincæ, and draw up a drop of its mucus. To do this it is necessary first to pull the cervix forwards, so as to be able to look into it and to see exactly what we are doing. If the cervical mucus is very tenacious we may fail to get it away. Then it will at the next attempt be necessary, after introducing the syringe, and drawing up the mucus, to pass the left index finger to the edge of the os tincæ, and slide the end of the syringe on to the end of the finger without raising it from the surface of the cervix, or breaking its suction power. This may seem to be a little thing to describe so minutely, but really it is a most important matter to know and to do, if we expect to be exact in our investigations. The nicety of this manipulation renders it the more important for us to clear away all the vaginal mucus before we undertake it, lest we get some of this drawn up into the syringe, which would, of course, mar the precision of our observations.

Suppose we succeed in this; then we may wish to pass the syringe up for an inch into the cervix to get a portion of mucus nearer the cavity of the uterus. This operation is quite as delicate and quite as important as the first, and is to be conducted in the same way. There is an object in having the end of the syringe bulb-shaped, as represented in fig. 140. This bulb fills up the os or the canal of the cervix, and prevents the air from being drawn into the instrument, as sometimes happened with me when it was slender and more pointed. For carrying a fluid of any sort into the cavity of the uterus, of course we need the nozzle of the syringe more like that represented in fig. 141; but for remov-

ing anything from the cervix the bulb form is the best.

As illustrating the exactness and the importance of this method of investigation, I will give an example.

Dr. Fauvel, the distinguished laryngoscopist, of Paris, requested me to see a patient of his, who had been married twice, and had had one child by the first marriage; none by the second. She was thirty-five years of age, the picture of good health, and menstruated regularly and normally. The uterus was slightly anteverted. She had no leucorrhœa, properly speaking; but the cervical mucus seemed to be slightly in excess of a normal quantity. What was the cause of her persistent sterility for the last eight years, and, indeed, for the last four years of her first marriage?

The questions to be answered were, Was the semen normal? Did the secretions of the vagina or cervix poison the spermatozoa? Did these enter the canal of the cervix?

The vagina was examined an hour after sexual intercourse. Its mucus contained living spermatozoa in abundance. The cervical mucus was full of them, but they were all dead.

On another occasion, a microscopic examination made but a few minutes (eight or ten) after coition, proved that the mucus of the cervical canal was full of dead spermatozoa, while in the vagina they were living. Here the litmus test was valueless; but the microscope demonstrated a superabundance of epithelial casts, the result of a slightly congested condition of some portion of the lining membrane of the cervix.

As said before, all abnormal secretions from the vagina have been classed under the generic term leucorrhœa, whether they emanate from the vagina, from the

canal of the cervix, or from the cavity of the uterus. Having already hurriedly glanced at the conditions of the first two that ordinarily give rise to such discharges, it only remains to notice those of the third,—viz., the cavity of the womb. We all know that muco-pus is the almost constant accompaniment of polypus, but as this has already been the subject of discussion we have here nothing more to say on it.

The cavity of the uterus sometimes becomes a regular abscess, as it were. This condition has been particularly described by Dr. J. Matthews Duncan, of Edinburgh.

Dr. West* (p. 137) says, "A peculiar form of uterine leucorrhœa, limited in its occurrence to the aged, and associated with dilatation of the cavity and atrophy of the walls of the uterus, has been described by Dr. Matthews Duncan, in the *Edinburgh Medical Journal*, March, 1860. Its characteristic symptoms appear to be peculiar lumbar and pelvic pain, accompanied by a sense of constriction, and the discharge of muco-pus. Its cure seems to require the dilatation of the contracted internal os by the sound, and the application of nitrate of silver to the interior of the womb. I believe that I have met with this condition on one or two occasions; but the patients, having their minds relieved with reference to the existence of uterine cancer, preferred putting up with the discomfort to submitting to treatment for its cure."

I have seen one well-marked case of this sort. The patient was about sixty years of age, and had had a purulent discharge from the vagina for twelve months or

* "Lectures on the Diseases of Women." By Charles West, M.D., Fellow, &c. Third Edition. 1864.

more. She was the mother of a large family of grown-up children, and had ceased to menstruate at about forty-five. The discharge from the vagina was pure pus; and it had almost a cancerous odour. On examination, I found the vagina full of pus, and its whole surface and that of the cervix were excoriated and granular. The uterus was retroverted, and of rather unusual size for the period of life. I did not detect the true nature of the disease for some time; not till I had succeeded in restoring the vagina and the cervix to a perfectly healthy condition. Then I discovered that the os, which was very small, gave issue to a slight though constant discharge of pus, and that this was the cause of the vaginitis, which I had mistaken for and treated as the original disease. The cervical canal was very narrow, flexed, and contracted at the os internum, so that the uterus, as it was bent backwards, always held about an ounce of pus. As the first step in the treatment, the cervix was dilated; the pus was then evacuated; the cavity of the uterus was washed out with warm water, injected through a tube small enough for the stream of water to regurgitate easily by its side; and then the pyogenic cavity was injected sometimes with the Tr. of Iodine, and sometimes with a solution of the Persulphate of Iron. The patient soon began to improve, and was finally cured.

We can thus medicate the cavity of the uterus with the greatest safety, if we are only careful to provide an easy retrogression of the injected fluid, either by the sponge-tent, or by forcible instrumental dilatation with Priestley's or Ellis's dilator or some modification of these.

Endo-metritis has recently been the subject of considerable investigation. Scanzoni, Routh, and others, have written much upon it; Dr. Hall Davis has ex-

hibited, at the Pathological Society, the uterus of a woman who died of this affection; and Dr. Oldham has shown me a number of valuable specimens in the extensive Museum of Guy's Hospital illustrative of the varieties of this disease, which may exist in various degrees of intensity, from a merely congested and eroded state of the uterine mucous membrane to the extent of great disorganization.

General constitutional remedies are, of course, indicated, but are here never of any great value without local treatment. Nothing in uterine disease is more difficult to remedy than endo-metritis. The first great principle to guide us is that of insuring a very free exit from the cavity of the uterus for the secretions therein generated. The second is that of appropriate local applications to this cavity for the purpose of modifying or healing, as it were, its diseased surface. Where the canal of the cervix is contracted, I have freely divided it, as in cases of dysmenorrhœa dependent upon mechanical obstruction; and this with great relief. Indeed, while menstruation continues, it is almost impossible to treat successfully a case of endo-metritis, without adopting this principle of practice in some form. The uterine secretions must not remain pent up in its cavity. With a patulous cervix, we may use medicated injections, or apply nitrate of silver in ointment, as recommended and successfully done by Professor Fordyce Barker, of New York. There is a mild form of endo-metritis that seemingly gives rise to no secretions whatever, which, nevertheless, is attended with great suffering, and often passes unnoticed, or rather undetected for a long time. Dr. Routh has particularly noticed this form, and calls it fundal endo-metritis. We can diagnose this with great accuracy.

Place the patient in the left lateral semi-prone position: introduce the lever speculum, hook a tenaculum slightly in the anterior lip of the os tincæ; draw this gently forwards, pulling the os open so as to be able to look right into it; then pass the sound, previously warmed, gently along the cervix, using no force whatever, but almost letting it go by its own gravity, as it were, to the fundus. This is attended with no pain whatever till the sensitive point be reached, when it produces the most intense agony, a pain that does not cease sometimes for hours after the experiment. I have seen many cases of this sort. And I now call to mind a most accomplished lady from one of the Southern States who had been married for six or seven years without issue; and who, soon after marriage, passed into a state of chronic bad health, and became a confirmed invalid. For three or four years she did not pretend to walk; and was always carried from the house to the carriage whenever she drove out. Indeed her time was spent mostly in bed or on a lounge. Fortunately she was able to eat, and so her strength and embonpoint were kept up in spite of her sufferings. Her greatest agony was to be found in a never-ceasing pain in the left hip about the joint. She had a granular erosion of the os and cervix, attended with a leucorrhœal discharge, which were cured in the course of two months. But the pain in the left hip, and her utter inability to walk, continued in spite of all we did. Thinking that the diseased condition of the cervix was the principal source of all her troubles, and that the pain in the hip furnished merely an example of Sir Benjamin Brodie's hysterical joint, I had made no further uterine explorations, and was quite surprised to find my patient no better in any particular after the cervical erosion and its discharge

were cured. And now, for the first time, I explored the cavity of the uterus. When the sound passed the os internum my patient complained of intense agony, but almost the whole of it was referred to the left hip.

Dr. Alonzo Clark was called in consultation, and agreed to the line of treatment to be adopted, viz., that of applying remedies to the uterine cavity. The canal of the cervix was dilated, and the disease, with its painful symptoms, was perfectly cured in a few weeks, simply by injecting the cavity of the uterus with a few drops of glycerine two or three times a week. This was in 1858. In the course of a year after this, our patient became a mother and has had other children since.

Mr. Holmes Coote and Dr. Greenhalgh are at this moment attending a case of endo-metritis with me, where the pain is almost wholly in the left hip and left inguinal region. By touching even the canal of the cervix with the sound in the gentlest manner possible, a most intense pain shoots at once to the left hip and groin. Here there is not only pain but tumefaction of the affected parts, as we often see in some forms of hysterical hyperæsthesia.

A short time ago, I saw a patient with Dr. Thierry-Meig, in Paris, who, besides other evidences of uterine trouble, complained greatly of pain in the left ovarian, left mammary, and epigastric regions. Her symptoms, as a whole, all pointed to the uterus as their origin; but a superficial examination failed to demonstrate their relationship. The position of the organ was normal; there was apparently no hypertrophy of the fundus; there was no leucorrhœa, and no engorgement of the cervix; but by placing the patient in the proper

position, and making the exploration of the cavity as above directed, the gentle passage of the sound along the canal of the cervix was attended by a sudden exudation of blood in small quantity, and a severe pain, which became more severe as the sound reached the fundus uteri, from which point the pain radiated to the other foci of suffering above indicated. The exudation of a small quantity of blood, by the passage of the sound along the canal of the cervix, is a common sign of subacute inflammation of the utero-cervical canal.

In this case a single sponge-tent, followed by the injection of half a drachm of the officinal Tr. of Iodine, produced almost complete relief at once. A repetition of the same, ten or twelve days afterwards, produced a perfect cure. For the past two years this patient had been under the treatment of several other physicians, without the least benefit.

I think it highly probable that many unexplained neuralgic pains may yet be found out to be symptomatic of some slight endo-metritic affection; of which the case last mentioned may be taken as a type.

It is very probable that when we shall turn our attention more to the investigation of the condition of the cavity of the womb, we shall be able to detect, to explain, and to remedy its abnormal states with as much certainty as we now treat many affections of the cervix and its canal.

In many cases in which the spermatozoa are found to die quickly in the canal of the cervix, the real source of the mischief may yet be found to exist in the cavity of the uterus.

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