This is, unfortunately, just what is lacking in most cases, and steps must be taken for its restoration before either can be satisfactorily used.

The operation of perineorrhaphy, as done to-day is simple in technique, quickly performed, and efficacious in restoring the perineal body, and even where the laceration is complete is rarely followed by any but good results, if done for rectocele, or prolapse of the posterior vaginal wall.

In the same way the various colporrhaphies are most excellent in their sphere, that of reducing the volume of relaxed and prolapsed vaginal walls, but we mistake the pathology when we regard colporrhaphy as quite analogous to perineorrhaphy.

The latter removes the cause of the affection for which it is done, while the former may or may not do so.

In one instance we operate upon a substantial body, capable of sustaining the prolapsed viscus which had escaped by reason of the laxity or laceration of that body; while in the other, we have to deal with simple mucous membrane which, sooner or later, must again yield to the same opposing forces, unless the cause be removed.

It is even more fallacious to expect simple constricting of the vagina to remedy a hernia of the uterus, without any attempt to restore the anatomical relations of the parts, particularly the correct angle of uterine and vaginal axes.

A large and heavy uterus, with its abdominal supports weakened and stretched, and fundus and cervix perpendicular to the pelvic canal, will soon burrow its way through the cicatricial vaginal tissue by its own weight, supplemented by the vis-a-tergo of intra-abdominal pressure.

This tendency can be happily overcome by bringing the fundus forward into its normally anteverted position.

The three most serviceable operations to secure this result are, shortening of the utero-sacral ligaments; abdominal fixation of the fundus, or ventrofixation; and shortening of the round ligaments.

The latter, which is known as the Alexander-Adams operation has more to recommend it, in my judgment, than any other procedure.

It is founded upon the principle not of suspending the uterus, but of using the round ligaments as guy ropes to steady the organ in its normal anteverted direction, and bring it into auxiliary relation with the natural retentive forces of the abdomen.

The operation is simple of accomplishment, may often be done without general anesthesia, and has given me such uniformly satisfactory results that I heartily recommend it to those who desire to master its improved technique, which I have already detailed in former publications.

In conclusion, I would re-emphasize these points:

1. Pelvic hernias should be recognized and classified as such, and not as diseases of the uterus and adnexæ; and their treatment should be based upon hernial pathology.

2. Prophylaxis, in the formative stage of puberty, as well as in pregnancy and labor, is of the utmost moment in this class of cases.

3. Operations upon the pelvic floor or vaginal walls, while indispensable in their place cannot be relied upon alone to cure all herniæ of the pelvic viscera.

4. The ideal treatment is to be found in the com-

bination of operations for repair, and those for accessory support from above, and these may all be accomplished at the same sitting, saving the delay and annoyance of repeated operations.

Venetian Building, Chicago.

VESICO-VAGINAL FISTULA; ITS ETIOLOGY AND TREATMENT.

Read before the Section of Obstetrics and Diseases of Women, at the Forty-fourth Annual Meeting of the American Medical Association.

BY AUGUSTUS P. CLARKE, A.M., M.D.

CAMBRIDGE, MASS.

Vesico-vaginal fistula may be described as a preternatural opening between the bladder and the vagina. The communication may be located at the cervix or at the fundus of the bladder. Sometimes an opening from the urethra into the vagina takes place; an opening thus established is usually smaller and less jagged than is one situated in the neck or in the fundus of that viscus. Urethro-vaginal fistulæ may result from the compression to which the parts are exposed during parturition. It will be observed that the urethra in its oblique descent under the arch of the pubes toward the meatus urinarius occupies for some distance the anterior portion of the vaginal wall; this position exposes the urethro-vaginal tissue to many accidents during a difficult or tedious parturient process.

In those cases in which the fistula is situated in a higher segment of the bladder, sloughing that has often caused an opening may have been superinduced or hastened by labor. Many conditions which are dependent on pregnancy favor the development of fistula; such conditions predispose to disease the vesical tissues which finally require only the super-vention of parturition for an actual occurrence of the morbid process.

An acute cystitis may come on during the course of pregnancy; in such cases there may be an extended vascular injection of the mucous tissue. Brownish or discolored patches may occur in the vicinity of the neck and fundus of the bladder; there will occur at first more or less induration or alteration of the vesical walls, and later there will be present a fibrinous and purulent exudation at different foci or in areas in which serious and degenerative changes have taken place. The disease may be limited to the mucous lining of the bladder; in cases in which there may be some renal complication the morbid process may penetrate the layers of the muscular coat and involve the peritoneum posteriorly in its upper zone or may implicate the vaginal wall anteriorly in its lower section. Suppuration may be dependent on the presence of minute abscesses occurring in the parietes of the bladder; ulcerative processes may also have so continued as to have led to softening, maceration, commencing gangrene or destruction of portions of the mucous and subjacent muscular structures.

Not long since I was called to an autopsy of a woman aged 37 years; she had died of acute pneumonia complicated with other serious troubles. There was found a degenerative change which had taken place midway between the fundus and the neck of the bladder. The mucous, the connective and the muscular plains in limited areas were observed almost entirely destroyed; the integrity of

the organ was only kept intact by the vaginal tissue which also had become exceedingly attenuated. The patient had suffered from two miscarriages; there was also a recent corpus luteum. There was no history of unusual suffering from vesical disturbances. It is, therefore, fair to presume that had the last pregnancy continued until the end of the full term, the strain upon the tissues incident to parturition, however carefully managed, would have been followed by the appearance of a vesical opening through the vaginal wall. Chronic cystitis may result in vesical fistula. The irritation excited in the muscular coat effects an alteration of the membrane; the parietes become thickened, indurated and from the exudation of matter the parts assume a fatty or homogeneous appearance. Ulcerative and suppurative processes are liable to supervene and finally lead at some point to the presence of complete fistula.

I have notes of an autopsy on the body of a lady aged 36 years, who having suffered from the effects of chronic cystitis died of cardiac disease. The kidneys were found to be congested and to be in the initial stage of granular degeneration. The bladder was somewhat contracted; the mucous tissue between the neck and fundus had undergone degenerative changes. The epithelium or basement membrane in patches was destroyed; the muscular tissue beneath was implicated. Narrow bands of the muscular coat which had been deprived of its interstitial and connective tissue could easily be caught up on a small probe. The vaginal wall in places was much thickened, while in other places it was well nigh perforated; the bladder contained a considerable quantity of urine, though the vaginal wall opposite the ulcerated points was exceedingly attenuated. The autopsy was made twelve hours after death. The patient had suffered from an accidental abortion and had also borne one living child since she first began to suffer from the cystitis. Her entire escape from an actual occurrence of complete fistula through the vaginal wall considering the pathological condition of the cystic tissues was indeed remarkable.

Emmet¹ formerly attributed in large measure the occurrence of vesico-vaginal fistula to childbirth. Out of 202 cases which came under his care at the Woman's hospital in New York, 171 were ascribed to this cause. He considered the condition of the bladder often affected the progress of labor. When the bladder was distended the labor would be retarded and would consequently prove an indirect cause of fistula. Marriage, late in life, he also considered may have some relation to the accident. The progress of labor occurring after such late marriage, may be retarded through want of elasticity in the soft parts. Instruments employed to terminate labor have been regarded as another cause. According to my own experience, however, it is difficult to see how the proper employment of instruments can enter into the factorage of causes when it is considered that such agencies brought into activity do materially abridge the hours of labor. It is an undoubted fact that the duration of the parturient process exercises an important part in the causation of vesico-vaginal fistula for the reason that the injury is often incurred in the first or in the second labor.

In cases in which the labor is unduly prolonged,

neglect to empty the bladder at proper intervals may be laid down as an exciting cause of the lesion. This should be regarded as especially so in those cases in which there has been cystitis. Some nurses who have been regarded as well trained, and even physicians of extended practice, occasionally fail in preventing in labor the bladder from becoming unduly distended. The reason given for such course in attendance is the fear that when the use of the catheter has once been resorted to it will have to be continued. This practice with such has been followed not only during the hours of labor but after its termination also, provided the patient has not demanded immediate help on account of severe suffering, or has not given indication of some passage of urine. Though in my own practice I endeavor to abstain from becoming too officious and from interfering with nature's normal processes yet I cannot but entertain much solicitude respecting the condition of the bladder especially in those cases in which there has been a history of recent cystitis. By following this method of procedure in a series of 2,500 consecutive obstetric cases coming under my care during many years of my private practice I have succeeded in preventing in every instance the occurrence of a vesico-vaginal fistula. In two cases which have come into my practice for treatment the fistula was caused by the removal of calculi through an excision above the neck of the bladder. In one instance a fistula was produced by an abscess occurring in the vaginal fornix. The opening, however, finally closed spontaneously. In one case to which I was called the injury was the result of an accident to the patient; she fell on a sharp instrument which piercing the right labium majus penetrated the vaginal wall just over the neck of the bladder. The length of the wound was nearly two centimeters. The application of sutures of annealed iron wire gave partial cure, which was subsequently completed by the employment of aseptic sutures of kangaroo tendon.

For severe cases of chronic cystitis Emmet's operation for artificial vesico-vaginal fistula is a valuable expedient. The chief objection to this method of treatment according to the records of my own cases is the difficulty in effecting a speedy closure of the incision, for when the opening has been allowed to remain for several months, without closing, the bladder becomes preternaturally contracted; the tissues also become thickened and indurated. Sometimes this condition of the structure of the bladder has supervened before the artificial opening has been made. With such factors to be dealt with the ordinary methods employed for closing the incision are often found in great measure ineffectual. A. F. McGill,² F. R. C. S., surgeon to the Leeds Infirmary, has given a description of an operation for vesico-vaginal fistula through a supra-pubic opening in the bladder; the operation is conducted somewhat after Professor Trendelenburg's method for supra-pubic cystotomy. Two cases are mentioned; the first operation was necessitated for the closing of a fistulous opening through the vaginal wall, accidentally made while attempting to remove an epithelioma involving the floor of the urethra for its whole length as well as part of the anterior vaginal wall, and base of the bladder. The edges of the fistula were brought into apposition; by means of supra-pubic drainage

¹ Principles and Practice of Gynecology, 1879.

² Lancet, 1890; also Retrospect, part ciii.

a complete and spontaneous cure resulted. The other case was an ordinary one; the injury followed labor. In this the operation through a supra-pubic incision into the bladder effected a cure. In cases in which a repeated operation fails to give relief the author advises that this method should be tried.

William Duncan,³ M.D., M.R.C.P., assistant obstetric physician at the Middlesex hospital, London, reports a case of extensive vesico-vaginal and recto-fistula cured by means of flaps dissected up as thickly as possible from the left side of the vagina with its lower end on the inner surface of the left labium majus. The flap measured one inch and three-quarters in length, and one inch in breadth. Carbolized lint was placed under the flap; eighteen days after the formation of the flap the operation was completed by freshening the edges of the opening into the bladder and fitting the flap to the fistulous track with the vaginal mucous membrane toward the bladder. Wire sutures were employed; a self-retaining rubber catheter was introduced into the bladder. The parts united and the fistulous opening was much diminished. Repeated attempts at operative interference finally effected entire closure of the bladder. The retro-vaginal rent was closed by taking a flap from the right wall of the vagina in a manner similar to the one taken from the left side. After the edges of the fistula had been pared the flap was fixed to the margin of the opening by means of silk and catgut sutures. This led to a perfect union and a final cure. The same author reports a case of vesico-vaginal fistula caused by extensive sloughing of the anterior vaginal wall. Closure of the vaginal wall after the method of Simon was resorted to for relief.

Herff⁴ (*Frauenarzt*, 1888) after splitting the vesico-vaginal septum around the opening turned in the edges of the vesical and vaginal mucous tissues respectively. Each is united by deep and superficial sutures. Several advantages are gained by this method. Aside from splitting the septum around the fistula no further denudation is required. This method precludes the necessity of removing to any great extent the cicatricial tissue; by reason of this an important advantage is gained, for when there is much cicatricial tissue in the vaginal wall it is often quite impossible to effect its entire removal. The mucous membrane at its edges after the division of the fistulous septum can easily be brought together; the abraded surfaces after being placed in such apposition readily unite. By the adoption of this method there is no loss of tissue. The operation can if necessary be repeated; if unsuccessful the tissues will be found to have escaped from serious injury from the operative interference.

In an elaborate paper read at the Ninth International Medical Congress at Washington, 1887, by Dr. Nathan Boseman⁵ of New York, emphasis is laid on the importance of dividing the cicatricial bands which often interfere with an operation for the closure of the perforated tissues. Such cicatricial bands were regarded as productive of undue strain on the coapted parts; this would occur before the tissues had united sufficiently to insure success to the operative measure. Cases have been reported in which adhesions of the anterior or of the posterior

lip to some portion of the vaginal wall or fornix have prevented the uterus from being brought down to the lower segment of the vagina when an operative measure was undertaken for the closure of the fistulous tract. Inflammation from laceration or from other injury to the cervix may set up in the vaginal tissue the formation of constricting bands that will have to be overcome before an operation for the closure of the fistulous opening should be undertaken.

J. Marion Sims in his effort to bring prominently before the profession the advantages an operation affords for the relief of vesico-vaginal fistula, maintained that sutures of silver wire were the ones best adapted to secure favorable results. His operation was originally undertaken without the employment of antiseptic precautions. The unique results which he obtained were undoubtedly due in part to the use of metallic sutures; such sutures to a great extent are aseptic. The rapidity of his work and the exercise of rare skill with which it was often accomplished, compensated in large measure for deficiency in other measures of his procedure. Sims was by no means the originator of the operation for vesico-vaginal fistula. M. Jobert de Lamballe, the eminent French surgeon to the emperor, has described in his *Traité de Chirurgie Plastique* the operation which, as early as 1837, he performed for vesico-vaginal fistula. Mr. Gasset in 1834, gave in the *London Lancet* a good account of the operation. Sir James Y. Simpson also seems to have anticipated Sims in this line of work.

Since the employment of antiseptic precautions has been generally adopted silk sutures aseptically prepared have by many operators been largely used. Silk sutures however carefully prepared, are not altogether free from danger. The properties of silk are not easily overcome by the action of the living tissues. The interstices of the structure of silk are liable to be invaded by microorganisms before the margin of the wound has united sufficiently to allow the sutures to be removed. Aseptic animal sutures are much to be preferred. No suture in my own practice has given so great a satisfaction; the employment of aseptic catgut sutures in vesico-vaginal fistula often yields excellent results.

Kangaroo tendon prepared according to Lister's formula are for this kind of work incomparably the best. After splitting up the septum round the margin of the fistula the deeper or vesical portion of the tissue should be brought together by means of a medium sized tendon suture. The suture should be applied after the manner of the cordwainer's stitch. After the layer of sutures has been taken through the vaginal or external tissue of the bladder the first line of sutures will be entirely concealed.

The sutures employed for the vaginal wall should be somewhat smaller than those for the vesical layer, and should be applied by introducing the needle first into one lip of the wound some distance from within by passing outward close to the edges of the coapted parts. After the sutures have been introduced the tissues through which they have been taken should be in such close apposition as to conceal all traces of their appearance. The sutures will thus be protected from the action of the fluids from the vaginal wall. By the insertion of tampons of cotton or of iodoform gauze or wool the vulvo-vaginal introitus will to a great extent be rendered aseptic. Repeated

³ British Med. Journal, 1887; also Braithwaite, part 98.

⁴ American Journal, 1888; Braithwaite part 98, 1889.

⁵ Transaction of Ninth International Med. Congress, Vol. 2.

catheterization of the bladder at regular intervals will prevent undue strain upon the vesical and vaginal tissues; these measures of proceeding if properly carried out will materially help to establish a speedy and permanent cure.

RECENT PROGRESS IN ELECTRO-GYNECOLOGY.

Read in the Section of Obstetrics and Diseases of Women at the Forty-fourth Annual Meeting of the American Medical Association.

BY G. BETTON MASSEY, M.D.

PHILADELPHIA.

The year's progress in the art of applying electricity as a remedy in the diseases of women has been of twofold character, embracing increased exactness in an art requiring technical knowledge of a high order on the one hand, and on the other an increased use of the remedy by conservative gynecologists. The allurements of a surgical ambition continue to operate as a bar to the higher electrical skill of some operators it is true, but a still greater number are becoming convinced that the diseases of women have a deeper significance than mere cosmetic accuracy of outline in pelvic organs; and that an agent capable of doing much in the cure of diseased processes, the relief of suffering and restoration of function deserves a more careful study than has been given to it by those who regard gynecology and surgery as synonymous terms.

RESTORATION OF FUNCTION.

It is too often forgotten that the highest art of the physician is shown in the restoration of normal functionation in an organ or set of organs. In the case of the pelvic organs of women, the disparity between the current literature devoted to the removal of more or less diseased members and their cure is very great and indicates, it is to be feared, that the lesser work replaces the greater in actual practice. The prevention of diseased action in organs is of course a still higher work, but while the busy physician may be pardoned for relegating preventive medicine in some measure to the hygienist, he should not be pardoned for neglecting possible cures of diseased organs and turning his attention exclusively to their ablation and amputation. One of the benefits conferred upon gynecology by the introduction of electro-therapeutics into its remedial armament, is the recalling of professional attention to healthier channels of therapeutic endeavor by the infusion of new hope in the efficacy of conservative methods.

In this agency we have a valuable remedy for the congestions and relaxations that interfere with pelvic functions, and lead consequentially to more pronounced disease. Its control over abnormal menstruation is often successful where drugs have been found to be ineffective, and it may thus be of service in the removal of those conditions so frequently leading to positive disease of the ovaries or of the nervous system in early maidenhood. A mere external application of the galvanic current of large dose between periods, through scientifically adapted cutaneous electrodes, may be amply sufficient as a curative remedy in both amenorrhœa and menorrh-spasm; but when this has been insufficient to cure in a given case, we must use the same method during the actual attack of menstrual pain. This almost invariably ends the immediate attack, though a per-

manently curative effect will require at times that an intra-uterine negative application be made, and my quickest successes have been attained when the application was made during the flow itself.

On the electrical treatment of menorrhagia and uterine hemorrhage I will not dwell, as its efficiency is generally conceded, though too often not used by those who continue to employ harmful drugs or curettage.

It is not a little strange that the classical treatises on gynecology, with the exception of that of Barnes, are practically silent on the disturbances of that function which, certainly next to menstruation and conception, is most closely associated with our practical work as gynecologists. In coining and defining the term *dyspareunia*, this writer, too, but touched on a considerable field of maternal impotencies, the bearing of which upon conditions and sufferings daily encountered is far more important than generally conceded. A little research in many cases of ovarian and lumbar pain in married women will point to this as a cause, even though periuterine tenderness or displacements may be present, and particularly if catarrhal conditions of the uterus and tubes are absent. A merely physical and passive performance of a function normally requiring a most delicate co-ordination of nerves, muscles and glands cannot be other than prolific of local congestions and more general nerve aches, and this result is often found in both participators, for a law of nature has been broken which even dogs obey. The causal conditions underlying dyspareunia are not merely hyperæsthetic conditions of the vulva, on which stress was made by Barnes, but also muscular relaxations of the vagina which make it impossible for the act to be reciprocal, leading to bruising and disturbance of the internal parts, and more or less pronounced nerve strain. The connection of electro-therapeutics with this subject is obvious. In the vaginal applications of both currents we have a direct exciter of the flagging energies of the constructor cunni and levator muscles and the circular fibers of the vagina, though care should be exercised that an over-long stimulation does not lead to fatigue. The swelling method of turning the current on and off is best, and the faradic current may be applied, either bipolar or monopolar, the coarse secondary or primary coils being selected in preference. Probably the most effective exciter is the combined primary faradic and galvanic, negative monopolar electrode, the indifferent pole being on the back. This method also relieves the congestion and tenderness in the uterus and ovaries while adding tone to the muscles.

In the treatment of maternal sterility due to catarrhal disease of the uterus the galvanic current may also be relied on as of direct service, in addition to the possible results that may be derived from electricity in the associated condition just described. The method is that employed in the treatment of endometritis, with or without accompanying menorrh-spasm, and its use will be found to be far more effective than the commonly practiced operations of dilatation, and less likely to be followed by diseased tubes and ectopic pregnancies.

THE RELIEF OF OBSCURE PELVIC PAIN.

Excluding the functional disorders that have been mentioned, acute inflammations and neoplasms, it will be found that most women apply for treatment