Gout, according to Semon and Watson Williams, is, comparatively speaking, the most fertile source of pharyngeal hæmorrhage.

Bleeding from the surface of the laryngeal mucous membrane must be distinguished from submucous hæmorrhage. Blood-clots may not be expelled, but remain lodged in or near the vocal cords, so as to simulate the appearances of an angioma, carcinoma, or a soft fibroma.¹

Symptoms.—A slight clearing of the throat is often all that precedes the patient's discovery of blood in his mouth. If it comes in any quantity the expectoration is accompanied by the peculiarly sickening and depressing taste and smell of blood.

When no trace of a leaking vessel is visible, the case should be treated as one of early pulmonary tuberculosis, particularly if any of the suspicious indications mentioned are present.

In my experience, as a laryngologist, hæmoptysis is due to pulmonary tuberculosis in the great majority of cases. When it has been absolutely necessary to demonstrate this, I have done so by passing an endoscope and viewing the blood coming up from one or other bronchus.

It is, indeed, quite rare for hæmoptysis to "come from the throat," except in well-marked local lesions. It is easily, and not infrequently, produced by malingerers making suction on their gums.

Treatment.—Treatment depends on the discovery of the source of bleeding. The local bleeding may require adrenalin, hamamelis (Pond's extract), catechu, or other astringents. The galvano-cautery, if at hand, is often the speediest remedy. When large vessels are eaten into by cancer or abscess, it may be necessary to tie the external or common carotid.

¹ F. Semon, *Arch. f. Laryngol.* iv. 418.

F. Semon, *Anm. des Mal d'Oreille*, xxv. 1899, No. 3, p. 241.

Von Geyer, *Münch. med. Woch.*, 1898, No. 15, S. 457.

The administration of lactate of calcium will increase the coagulability of the blood. A hypodermic injection of morphia, $\frac{1}{8}$ gr. to $\frac{1}{4}$ gr., with atrophine $\frac{1}{200}$ gr. to $\frac{1}{150}$ gr., is one of the readiest, quickest, and most reliable remedies.

In all cases the patient should be ensured complete rest, and fresh cool air. Alcohol and hot fluids should be forbidden. Solid food is not necessarily avoided. Excitement and fear must be guarded against. The sucking of ice, a weak spray of adrenalin, and small doses of opium may be indicated.

TREATMENT OF UTERINE PROLAPSE.

LECTURE DELIVERED AT THE ROOMS OF THE MEDICAL SOCIETY OF LONDON, ON MONDAY, NOVEMBER 14, 1927.

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(*A Fellowship of Medicine Post-Graduate Lecture.*)

LADIES AND GENTLEMEN,—I have chosen for this lecture the subject of prolapse, because it is the commonest important condition met with in diseases of women, and because there is still an almost ineradicable feeling amongst doctors that prolapse cannot be cured by operation. This is an absolute fallacy. By modern methods of treatment prolapse can be cured, both anatomically and symptomatically. Therefore it is very important that the subject should be more ventilated than it has been.

In order to enable you to follow my argument with regard to the method of cure of prolapse, I want, first of all, to go into a few anatomical details as to the pelvic arrangements, so that you may realize why it is that the condition of prolapse occurs.

The word itself, as applied to the uterus, is a misnomer ; the uterus has nothing to do with the condition. It is really a displace-

ment of all the movable structures of the pelvic floor, of which the uterus is only one, and it descends merely because it is part of the movable structures in the pelvic floor. You may be familiar with Hart and Barbour's description of the pelvic floor, which was written about forty years ago, and yet it is to-day the best description ever written of the pelvic floor as a whole. I will just recall it to you, because it is of some interest if you do not know it.

Hart and Barbour argued that the pelvic floor was made up of movable structures and fixed structures. The movable structures form a triangular mass in front, and include bladder, urethra, peri-urethral connective tissue and fat, peritoneum, uterus and the anterior vaginal wall.

The fixed structures of the pelvic floor lie posterior to this, and include the posterior vaginal wall, the rectum, and particularly the levator ani muscle and its fascia. These fixed structures make up another triangular mass upon which the anterior movable structures rest.

The two meet round about the cervix uteri.

We know that the anterior structures are movable because during labour the bladder is drawn up above the pubes, and takes with it the dilating cervix. We know that the posterior structures are fixed because they do not move up or down, they merely stretch or are pressed backwards into the hollow of the sacrum.

When we study the condition which we call prolapse, we find a vast amount of movement which is seen is inherent in these anterior structures. We know that the bladder, the anterior vaginal wall, and the uterus will so descend that they lie outside the pelvic cavity. When I speak of the condition known as rectocele, I shall have to tell you that the rectocele bulges forwards but does not descend *en masse*, like these anterior structures do.

Another point of considerable interest is that when you come to study the arrange-

ment of these triangles you find they are like folding doors. During labour, as the cervix dilates, the anterior door swings upwards, the posterior is compressed backwards, opening wide the pelvic outlet and allowing the child to be born.

And I want to recall to you the anatomy of the levator ani muscle. This muscle has two particular points of attachment : one of them is behind the pubes, and the other at the spine of the ischium. From those two points there stretches a line of fascia, familiar to us as "the white line." From that line of origin the muscle forms a sheet, which stretches backwards or inwards, to join in the median raphé behind the rectum and between the rectum and the coccyx, leaving a space between the two halves, which I shall allude to as the pelvic floor aperture, and which has a very important relationship to the pelvic viscera in general. A lateral view of the muscle shows the lowest fibres, those which form the pubo-rectalis portion, sweeping round the urethra, vagina and rectum and meeting behind the rectum in the median raphé. It is that pubo-rectalis portion of the muscle which is the most important part as regards keeping the pelvic viscera in their place. Looking at the narrow aperture you can understand how the bladder will bulge over and rest upon this portion, also how the uterus might do the same thing if the aperture is sufficiently narrow for its edges to hold up the uterus.

I remind you that prolapse is essentially a condition brought about by labour. It does occasionally happen in virgins, but they are extremely rare cases, and those women usually have some anatomical peculiarity which we have been unable to explain.

Consider what the effects of parturition must be upon this muscle. You realize that the first consequence is a widening of the pelvic floor aperture ; the mere passage of the foetal head through that aperture, normally only about $1\frac{1}{4}$ in. wide, must stretch it considerably. Naturally, the

smaller the head which has to pass, the less the stretching. And not only is the muscle stretched, its fascia also is stretched. And it is reasonable to say that under some circumstances there must be a tearing, perhaps of the muscle, or more likely of the fascia which encloses the muscle. There is no attachment of this muscle to the perineal body, it merely passes by the side of it; so that tearing of the perineum, in itself, does not damage the levator ani. It is merely a question of stretching as the head passes through which is the cause of the damage. You may remember that in cases of complete tear of the perineum, where the rectum is torn widely open, prolapse is almost unknown. The uterus and the bladder remain in their normal position for years. I can only recall two or three cases of complete tear of the perineum in which there was any degree of prolapse at all; showing that damage to the perineum itself is not an important cause of prolapse; it is the outward and visible sign of inward damage. The cases in which parturition does the most harm are those in which labour is prolonged, where the child's head is large, where uterine action is weak, and where there is prolonged stretching and bruising of that extremely important structure, the levator ani muscle and its fascia. On the other hand, precipitate labour, which tears the perineum into the rectum, as a rule does very little damage to the levator ani, because stretching is brought about so quickly that there is no bruising and no permanent widening of the pelvic floor aperture.

The levator ani muscle, however, is not the only important structure which helps to keep the pelvic viscera in place; there is another, and that is the structure which is known as the transverse cervical ligament. It is a band of connective tissue which passes from the side of the cervix to the lateral wall of the vagina, and is continuous with the pelvic fascia in all directions. It is merely a portion of the pelvic fascia, and

surrounds the uterine artery, veins and lymphatics as a sheath. Primarily it is the sheath of those vessels, secondarily it acts as a ligament to hold the cervix in place in the pelvis. Being transverse in direction, it must act to considerable mechanical advantage in holding the uterus in place. In a normal individual, if all the attachments of the uterus are cut, including the vagina, the broad ligaments, the round ligaments, &c., leaving the base of the broad ligament intact—in which this transverse cervical ligament runs—the uterus will still remain in its natural position in the pelvis. From a practical point of view there are no other supports to the uterus which are of importance. The round ligaments, the broad ligaments, the utero-sacral ligaments, are too lax in their structure to act in any way as guy ropes to hold up the uterus. The round ligaments can be made to keep the uterus anteverted, as we know in the operation of shortening the round ligaments, but in their normal condition they do not prevent retroversion.

The ætiological factors, therefore, which cause prolapse are two important ones: damage to the levator ani muscle and widening of the pelvic floor aperture, and, secondly, stretching of the transverse cervical ligament so that the cervix can be pulled down to the vulva or pushed up almost to the umbilicus. It is easy to see, from what I have said, how the pelvic floor aperture is enlarged; it is not quite so easy to see how the transverse cervical ligament is damaged. I think it is damaged more often by the too early application of the forceps than by any other means. If the forceps are applied to the head before the cervix is fully dilated, pulling downwards will pull the uterus with it, and pulling the uterus down almost to the vulva must lead to over-stretching of the transverse cervical ligament so that it may not be able to recover its tone afterwards, and the uterus gets permanently loose. Normal labour, carried out without any instrumental interference, seldom leads to

stretching of the transverse cervical ligament, because, as the cervix dilates and goes up over the head, it remains almost in the same position in the pelvis; there is no downward forcing of the uterus which could strain this lateral transverse ligament.

Now I want to point out one or two things which form the sequence of events in what may be called the common type of prolapse. The first sign is a bulging of the anterior vaginal wall and bladder, which constitutes a cystocele, the commonest of all the manifestations of this condition which we call prolapse. It is due, primarily, to the widening of the pelvic floor aperture, but in addition, it is due to damage to that very thin sheath of muscle which runs between the two halves of the levator ani muscle, and which is known as the pubo-cervical muscle sheath. It is a microscopical muscle sheath; it is easily seen in sections, and it has an important function in keeping the two halves of the levator ani together, and in forming a weak, but efficient, basis upon which the bladder rests. It must be badly damaged whenever there is any widening of the pelvic floor aperture. A cystocele can exist absolutely by itself without descent of the uterus at all. It can form a large protrusion through the vaginal orifice, and may constitute the only evidence of the condition we call prolapse.

Another condition we meet with is rectocele, the anterior wall of the rectum bulging over the sphincter ani and appearing at the vaginal entrance as a soft swelling when the patient strains. Rectocele has an entirely different origin from cystocele. Really, rectocele has nothing to do with the condition we call prolapse; it is an added condition. It is the result of tearing of the perineum and then healing by granulation without suture, so that the posterior vaginal wall, when it has formed afresh, adheres strongly to the rectum by scar tissue, instead of by loose areolar tissue. This is immediately affected by the act of defæcation. Normally, in defæcation the rectum and

vagina slide upon one another by means of loose areolar tissue, but when the two are firmly united, a mass of fæces coming down in a forward direction must make the anterior rectal wall bulge over the sphincter if the levator ani muscle is not performing its functions properly. Normally, the levator ani muscle straightens out the canal and lets the mass of fæces pass out; but that muscle having been damaged and the posterior vaginal wall having become firmly fixed by scar tissue to the rectum, there is a constantly recurring bulge of the anterior wall of the rectum over the sphincter. Spread over a number of years, that bulge will assume enormous proportions, and may exist by itself without any descent of the uterus, without cystocele. But when the uterus is loose because the transverse cervical ligaments have been over-stretched, the pull of a cystocele—because every time the patient strains, or even inspires, the bladder must bulge downwards—stretches the anterior vaginal wall. That must pull on the cervix and tend to pull the uterus downwards. A rectocele must pull on the posterior vaginal wall, and if the two conditions exist together, and the uterus is loose, it will descend more readily. If there is only cystocele, the descent of the uterus will be slow but sure. On the other hand, if the uterus is not loose when there is a well-marked cystocele or rectocele, or both, there will be the same pull on the cervix, but the uterus not being loose, the cervix will suffer, the uterus, perhaps, not descending at all. The pull on the cervix leads to a gradual elongation of it, and the elongation will be in the supravaginal portion. That elongation may be so great that the cervix is outside the vulva while the fundus of the uterus remains in its normal position. The best example of that I have seen was in a severe case of cystocele and rectocele, in which a surgeon had performed ventro-fixation; he had fixed the fundus of the uterus to the abdominal wall, hoping to thereby cure the condition. The uterus

remained firmly fixed to the abdominal wall, but at the end of three months the cervix was hanging out of the vulva just the same, because the cystocele and rectocele had gradually stretched it and made it appear in that way. That was the best argument I ever saw to prove that ventrofixation is no cure for prolapse in any of its manifestations.

As time goes on, the loose uterus will descend more and more until the vaginal walls are completely everted and the uterus lies outside the vulva. This condition is known as complete procidentia. The greater part of the mass in procidentia is made up of small intestine, which comes down through the space between the coccyx and the pubes to fill up the widely-dilated Douglas' pouch.

This leads me to mention another point, and that is, that the word "prolapse," though it describes what we mean, is inadequate as a definition of complete procidentia. It is really a true hernia; it is a hernia because it has definite coverings: the anterior and posterior vaginal wall and the uterus. It has also a sac of peritoneum, and its contents consist of small intestine. The space through which it comes down is the widest space through which any hernia descends. It is bounded by the pubes and sacrum, and on either side by the wide pelvic floor aperture, bounded by the pubo-rectalis portions of the levator ani muscle. The bladder is, very largely, external to the body, and a great part of it lies in the sac below the level of the urethra.

The question of symptoms in prolapse is of some interest, first, because there are so very few. I will recall to you one or two small points.

The woman who has a small, the smallest, degree of cystocele and nothing else, often has a very troublesome condition of micturition, that form of partial incontinence in which a little urine is passed every time she strains, coughs or laughs, a very distressing complaint, and rather common. It is due, essentially, to a widening of the pelvic floor aperture, damage to the pubo-cervical muscle

sheet, and a very small, often negligible, cystocele. Women who have large cystoceles and the worst degrees of prolapse have no disturbance of micturition, certainly no partial incontinence. They may have difficulty in starting micturition; sometimes you may be told they have to lie down and push the cystocele back before micturition can be performed. Backache every woman with prolapse has. Some have pains in the groins, which I think, must be due to dragging on the transverse cervical ligaments, and possibly dragging on the utero-sacral ligaments to some extent. But it is a very important feature, because it is not infrequently mistaken for some abdominal condition such as appendicitis, salpingo-oöphoritis or gallstones, and useless operations have been performed on the abdomen, when all that was needed was a repair of the pelvic floor. I mention this to remind you that some of these cases have dire complaints of their own which are merely the results of mechanical derangements.

Local effects of prolapse are of importance in the shape of ulcerations on the projecting portions of the vagina, and discharge therefrom, sometimes causing the suspicion that the patient has cancer. It is a very interesting fact that women with prolapse practically never get cancer of the cervix; only once have I seen cancer of the cervix in a severe case of prolapse. If there is anything in the irritation theory of cancer, you would have thought that a cervix which was outside the vulva most of the time would be a site in which cancer would develop. It is not so, however. Therefore, you can at least comfort your patients by telling them, if they have prolapse, that they will not have cancer.

Treatment.—Palliative treatment for the condition of prolapse we shall always have with us. It is quite obvious that not every patient with a cystocele or a rectocele will submit to operation; nor would it be advisable for every one of those patients to do so. But, at the same time, there is a growing

tendency for patients to submit to operative treatment far earlier than was formerly the case. And clearly it must be better for them that this should be so, because, though the severe cases are curable just as easily as the slight ones, the operation is more difficult in them, and is of greater magnitude.

With regard to the use of pessaries, the only time that a pessary has a curative effect is just after delivery in those patients who complain that they have a sensation as of their inside falling out, and where there is no obvious serious damage to the pelvic floor. In a few such cases the wearing of a pessary for three months will allow of complete involution of the uterus and the ligaments in the pelvis and lead to a cure, so that the pessary can then be discarded. Pessary treatment, however, for prolapse which is already established must be continued for the rest of the patient's life, unless she will submit to operation. Pessary treatment never cured an established prolapse; the prolapse gets steadily worse, and larger pessaries have to be used; the menopause makes no difference to a prolapse.

I would add one more aphorism to those concerning the uterus having nothing to do with prolapse, and that is that it is useless to remove that organ. Not many years ago there was a vogue—not so much in this country, but particularly in America—for the removal of the uterus for the cure of prolapse. It was very soon found that removal of the uterus had no effect, that the vaginal walls turned inside out whether the uterus was there or not.

The rational cure of prolapse depends upon properly conceived and executed pelvic floor operations. It is not necessary to open the abdomen in order to cure prolapse. When there is a persistent retroversion and flexion after pelvic floor plastic operations have been done, it is occasionally wise to open the abdomen and fix the uterus forwards, because some of those patients complain of backache, and feel no better for the plastic operation. But I should say

that, taking it all round, it is absolutely unnecessary to open the abdomen in more than about one case in forty to effect a cure of that type of prolapse. I want to lay special stress upon this, because there are still many operators in the world who believe you cannot cure prolapse unless you fix the fundus of the uterus forwards by ventrofixation or Gilliam's operation, or other procedure of the kind. I know from my experience of 1,500 cases that this is quite unnecessary. Perhaps twice a year I do Gilliam's operation in addition to pelvic floor plastic operations. The pelvic floor operation, however, must be very widespread and thorough to get a symptomatic and anatomical cure. No perfunctory perineorrhaphy will cure a prolapse. Formerly a perineorrhaphy was often done to enable the patient to hold a pessary, these patients having such a wide vaginal outlet that a pessary would not remain in place. But to do perineorrhaphy for this object is simply a confession of failure; the patient has been submitted to an operation which is not curative. Nearly every case of prolapse requires more than one operation; many of them require anterior colporrhaphy, amputation of the cervix, posterior colporrhaphy and perineorrhaphy, in that sequence. The question whether amputation of the cervix is necessary depends on its size and its length. When the cervix is much elongated you will not cure your patient unless you reduce the total length of the cavity of the uterus to its normal. So amputation has to be done when there is much elongation of the cavity of the uterus.

To decide when you must do anterior colporrhaphy is not so easy. It is not necessary in every case, but a rough working rule is that, where there is definite bulging of the bladder on straining, and where you can, with the patient under an anæsthetic, pull the cervix down to the vulval outlet, you must do an anterior colporrhaphy. In many cases of so-called prolapse under an anæsthetic, if you take hold of the cervix with a

volsellum, it is almost immovable, as if fixed by scar tissue. Those are not cases of descent of the uterus, but of cystocele or rectocele, or both.

A large cystocele seldom occurs when the cervix is firmly held up in the pelvis by old inflammatory scar tissue. When you have to perform anterior colporrhaphy for a big cystocele, with the cervix held high up in the pelvis, the operation presents great mechanical difficulties.

OPERATIVE TECHNIQUE.

Anterior Colporrhaphy.—The cervix is pulled right down to the vulva, the vagina is picked up $\frac{3}{4}$ inch below the urethral orifice, and a straight incision is made between these two points. The incision must be through the vaginal wall so as to expose the loose tissue between it and the bladder. Holding the edges of the vaginal incision with artery forceps the bladder is now completely separated from the vagina laterally by blunt separation with a layer of gauze on the finger. The bladder is next separated from the cervix by snips with scissors as high as the uterovesical fold of peritoneum. One or two small arteries may have to be tied at this stage. The bladder can now be pushed upwards out of sight.

Three mattress sutures are now put through the vaginal walls right out at the sides, which when tied will bring the lateral margins of the vagina together in the mid-line. These sutures take in a considerable thickness of tissue including muscle, and form a strong longitudinal buttress on which the bladder may rest. The sutures are now tied, and the excess of vaginal wall is cut away. These cut edges are now united with a continuous suture. Some operators put in a purse-string suture to pucker up the subvaginal tissues beneath the bladder. This I feel sure is wrong in principle, as it tends to shorten the vaginal wall, to pull the cervix forwards and retrovert the uterus. I aim at keeping the

vaginal wall long, so as to throw the cervix back into the hollow of the sacrum.

Posterior Colporrhaphy and Perineorrhaphy.—Unlike most operators, I follow the Manchester school in doing posterior colporrhaphy, by beginning at the top of the vagina instead of at the bottom, $\frac{3}{4}$ or 1 inch below the cervix. This point is the apex of a triangle of which the base will eventually be at the remains of the perineum. It is much easier to strip the vaginal wall from above downwards than from below upwards. The triangle above-mentioned is marked out in stages by picking up the vaginal mucosa with artery forceps as far out at the sides as is deemed necessary. The vaginal wall is dissected off the subperitoneal tissue of Douglas' pouch above and the rectum below, and is finally cut away with scissors in a curved line from the labium minus on one side across the skin of the perineal remnant to the labium minus on the other side. Not only is this triangular piece of vaginal dissected downwards in stages but it is also sutured in stages with a continuous catgut stitch. Before the last half is sutured, the essential part of the operation must be carried out, namely, the suture of the two halves of the levator ani muscle. This is done with Reverdin's needle much more easily than with any other ordinary needle. The muscle is not dissected out from its fascia but is simply dug up from behind the ascending ramus of the tubes in its fascia with the needle. Two or three strong catgut sutures are passed from side to side, which when tied bring the two halves of the muscle together in the mid-line. Thus a thick mass of muscle and fascia is interposed between the rectum and vagina, and effectually prevents the recurrence of a rectocele.

The vaginal wall suture is now completed, taking care that any spouting vessels are carefully tied in the suture or separately. Nothing remains but to complete the reconstruction of the perineal body by suturing the deep layer of the superficial fascia (Colles' fascia) in the mid-line, and to unite the skin

of the perineum by a separate continuous suture of catgut. A plug of gauze is placed in the vagina to provide drainage for twenty-four hours.

To prevent sepsis after this operation, the vagina should be plugged for twenty-four hours beforehand with gauze soaked in 10 per cent. "Milton" solution and then swabbed out thoroughly with 2 per cent. solution of iodine in spirit before commencing the operation. Post-operative complications are few. A fair number of these patients are unable to pass urine naturally for several days, and they must have a catheter passed eight-hourly. It is far better, however, to allow the patient to micturate naturally if she can.

If there is any sepsis, it is only superficial, as there are no through-and-through sutures to convey infection from the skin to the deeper parts of the wound. Slight superficial sepsis, however, may lead to the only really troublesome complication, namely, secondary hæmorrhage. This always occurs from a small artery just under the vaginal mucosa on the posterior wall, and may give rise to serious bleeding. Fortunately it is not a common occurrence, and is usually easily checked by a light plug of gauze, the last inch or two of which is soaked in one of the blood-clotting serums. Very rarely it has been necessary to give an anæsthetic and stop the bleeding by putting a mattress suture through the vaginal wall around the bleeding vessel. (Four times only in 1,500 cases.)

One death only has occurred in the whole series, and that was from pulmonary embolism six days after the operation.

No douches are given after the operation, they can do no good, and may do harm by the douche nozzle being pushed in amongst the sutures.

Pain is often severe and requires sedatives, usually morphia at night and aspirin, gr. x, thrice daily. As the bowels are not to be opened for three whole days, the administration of morphia does no harm.

The patient is kept in bed seventeen days,

and allowed to go home at three weeks, with strict injunction to rest on a couch for another fortnight, walking no more than is necessary to get from one room to another on the same floor. The results of the operation are excellent, especially as regards relief of dragging pain, backache, and complete prevention of any descent of the pelvic organs. The age of the patient makes very little difference, the oldest patient in my series was 73, and had a complete procidentia.

THE GENERAL PRINCIPLES OF NUTRITION.

A LECTURE DELIVERED AT BURY ST. EDMUNDS.

(Under the auspices of the Fellowship of Medicine.)

By ERIC PRITCHARD,

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(Continued from p. 69).

THE importance of balance with respect to the representation of proteins, carbohydrates and fats is now fairly well recognized in the feeding of individuals of all ages. So, too, is the need of a sufficiency of vitamins, but the importance of a correct mineral balance in the running of the animal engine is only just beginning to be appreciated. Every mineral has its special use, and there is an optimum amount for each. If this amount is exceeded, or falls short of the needs of nutrition, the efficiency of the engine as a working machine will suffer in proportion. Nutrition under such circumstances can never be at its maximum. Infants are nearly always starved in respect of iron, iodine, and potassium, and they are often overdone with sodium and calcium. Older children on a mixed diet are, as a rule, starved of all mineral elements.

I have drawn up for your benefit a table which represents the mineral requirements