THESIS

on

PROLAPSUS UTERI

for the Degree of Doctor of Medicine,

by

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CARLISLE.
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The subject of prolapsus uteri will be acknowledged by most medical practitioners to be one of the least satisfactory portions of gynecological literature. While now generally recognised as a true hernia, it is described in many of the text books along with the other uterine displacements and with hypertrophies of the cervix.

The treatment of prolapsus uteri must seem to many of us in a chaotic state. Many of the operations proposed are purely empirical, and their number and nomenclature are, I think, without a parallel in surgery.

The average layman would look askance at the long list of operations suggested and performed for the relief of this condition, and would be further surprised if told that these were not done singly, but by the half-dozen. He might gather from the literature that a start would be made with such a series of operations as the following:— Curettage of uterus and a supra-vaginal amputation of cervix; anterior colporrhaphy and colpoperineorrhaphy, and the sitting
to be concluded by a ventral fixation, with perhaps shortening of round, broad or utero-sacral ligaments. Such a series of operations is by no means uncommon, especially in the practice of American surgeons, and is sufficiently alarming even to the medical practitioner.

Pozzi, in the new Sydenham Society's edition of his works, begins his description of the surgical treatment by mentioning some 5 or 6 old-fashioned methods which he characterises as 'abominable'. It does not require a great stretch of imagination to see his list, in the course of a few years, greatly enlarged.

Recent operations which seem to me far removed from scientific lines, include the injection of paraffin into the vaginal mucosa\(^{(1)}\) and the injection of a solution of quinine into the broad ligaments in order to cause inflammatory reaction and consequent shortening.\(^{(2)}\) It is now many years since the injection of septic fluids was suggested in the treatment of bronchocele with the object of setting up inflammatory reaction. In comparing the two latter operations, one might be excused a momentary hesitation in deciding which was the better. The second

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of these operations recalled to my mind a proposal I once heard and which seemed to me but an ill-timed joke. This was Dr. Chippendale's suggestion to utilize the poison of gonorrhoea in the hope of producing inflammatory reaction in the uterine ligaments. It is referred to by Prof. Thorburn. (1)

Questions naturally arise as to the existence of a cause for the unsatisfactory position in which the treatment of prolapse stands, and as to whether parallel cases are to be found. Taking the latter question first, one does not require to go far back in gynaecological literature for examples, among which may be mentioned the treatment of masturbation, of dysmenorrhoea, and of the condition known as ulceration of the cervix. We are now prepared to condemn the indiscriminate removal of clitorides and ovaries and the complicated treatment of a condition that did not exist; but these operations were at the time advocated by men of high standing in the profession.

The nearest parallel, however, for my purpose is to be found in the recent history of another variety of hernia where it is also necessary to preserve the lumen of the canal through which the hernia descends. I refer to oblique inguinal hernia.

(1) Thorburn - "Diseases of Women." 1885. p. 296.
in the male. In the normal condition the strength of the inguinal canal lies, not entirely in the narrowness of its lumen, but also in its length and oblique direction. (1)

Here also there is a history of endeavours to cure the condition by setting up inflammatory reaction. Up to ten years ago the majority of operations for the radical cure of this condition tended to shorten the inguinal canal and to leave it a more direct route from the abdomen than in the normal state. These operations are not mentioned for the purpose of condemning them. They were, and are, wonderfully successful, but their measure of success was not attained by an adherence to the mechanical principles followed by Nature. They aimed at making the canal so tight that none of the abdominal contents could escape through it. Indeed the story is told of one practitioner, boasting that he pulled the pillars of the internal ring so tightly together, that in many of his cases the testicle of the same side atrophied. In contrast to these operations, take such recent ones as Bassini's (2) or Halsteads, (2) which, speaking broadly, aim at defeating the effects of intra-abdominal pressure by increasing the length

and obliquity of the canal. Such an aim at once appeals to one's mechanical sense as correct, both from an anatomical and a structural point of view. The success which has attended these, amply justifies this approximation to nature's method.

With regard to the first question - the reason for the unsatisfactory position of the subject may, I think, be found in a distorted appreciation of the nature, of the anatomy, and of the causation of prolapse.

In this attempt to simplify the subject, I cannot offer any new anatomical facts, though the necessity for these is evident to all observers. So far as I am aware, the only published accounts of the sectional or dis-sectional anatomy of prolapse are those by Schutz (1) and Berry Hart; (2) and the specimen from which the latter was taken is unlikely, I believe, on account of its condition to furnish fuller details. (3) Nevertheless, it is with some degree of confidence that I make the attempt, and hope to present a satisfactory case for the operative procedure which I advocate.

(1) Arch. für Gyn. Band xiii. s. 262.
(3) A specimen belonging to Professor Symington, and at present in the possession of Dr. Berry Hart.
NATURE:

Prolapsus uteri is now generally recognised as a hernia, to which Dr. Berry Hart has given the name of "sacro-pubic hernia". It consists of a downward bulging or protrusion, into, or through, a definite canal, of various pelvic or abdominal viscera.

The canal is formed by the vaginal cleft in the pelvic floor, and will be considered with the anatomy.

I think a more descriptive term than "sacro-pubic" might, with advantage, be used, but it is difficult to find one. A name such as "Hernia through the vaginal ring" appeals to me, and would more nearly approach the Terminology in other herniae.

The viscera, which may take part in the hernia, are the bladder, the uterus and its annexa, the rectum, and other portions of the gut—usually the small intestine.

Prolapse may be complete or incomplete.

Physiological variations in the level of the uterus and neighbouring organs occur as the result of straining, weight lifting, and other muscular efforts during early pregnancy, and from occasional over-distention of bladder or rectum. These are distinguished from pathological descent by the fact, that the
bulging is against, and not into, the hernial canal.

In incomplete prolapse, one or more of the above-mentioned viscera bulge into the weakened hernial canal. The first palpable signs of this are usually a descent of the cervix into the lower half of the vagina, with some straightening or retroversion of the uterus, occurring whilst walking or straining, or prolapse of anterior vaginal wall, with or without cystocele; or these two may occur coincidently.

Complete prolapse is more difficult to define, but I should call it complete when the prolapse is sufficient to protrude any portion of the above viscera beyond the pudenda, that is to say, when some portion of the hernia has cleared the hernial canal.

Such a hernia is as complete in a surgical sense as the so-called procidentia, where the whole uterus comes to lie external to the pudenda.

This definition of complete prolapse at once raises difficulties, as it might be stretched to include the projection of a cervix hypertrophied in its intermediate or supra-vaginal portion. While this is certainly not to be classed with prolapsum uteri in the ordinary sense of the term, it is undoubtedly, in my opinion, a hernial protrusion of portion of a viscus, and is as much hernia as is an
inguinal epiplocele.

The same would apply to other over-growths from the uterus, such as large submucous fibroids appearing externally.

These, I think, deserve mention in a consideration of hernia through the vaginal cleft of the pelvic floor; but as they are peculiar in being pathological over-growths, and are merely extruded by reason of their growth, and especially as their effect on the pelvic contents differs markedly from that produced by an ordinary hernia, I should leave them to be discussed under the pathology of the uterus. As herniae, they would be classed with such conditions as hernia cerebri and hernia testis.
ANATOMY:

In the present state of our knowledge of the pelvic contents and floor, it is impossible to describe the anatomy of prolapse without first indicating one's attitude towards the principal points in dispute. So far as the relations of pelvic viscera, muscles and fascia are concerned, there are only slight differences between the various authorities. The only one of these to which a reference is necessary is as to the insertion of the levatores ani. The anterior portion of these muscles is described by Alban Doran (1) as having an insertion into the vaginal walls, the pubic fibres blending with the posterior half of the upper border of the sphincter vaginae. So far as I know this has not been corroborated by any other observer, and a study of the sections published by Dr. Hart and others, rather points to the attachment being a fascial one. The point, however, is of no great importance from a surgical point of view.

The debatable ground is reached when one comes to define that portion of the abdomino-pelvic boundaries called the pelvic floor. The lower or

external boundary of the pelvic floor presents no difficulties, nor is there any dispute about it. The disputed points are — firstly, as to whether certain structures passing through the floor should be considered part of it, and secondly, as to the line of demarcation between pelvic floor and pelvic contents.

Dr. Hart (1) includes in the pelvic floor, the urethral walls, the bladder, the vaginal and anal walls, and part of the rectum. Professor Symington (2) includes the urethral walls, the lower half of the posterior vaginal wall and the anal walls, but does not definitely say whether or not he also includes a portion of the anterior vaginal wall. The upper part of both vaginal walls and the rectum he definitely excludes.

With regard to the upper limit of the pelvic floor, there is a wide difference of opinion between the above mentioned gentlemen — a difference which would very materially affect a description of the anatomy of prolapse.

Dr. Hart describes the floor as having an outer skin aspect and an inner peritoneal one (3).

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(1) The structural anatomy of the female pelvic floor. Ed. 1880.
He says (1):— "The abdominal cavity has its inner aspect defined by peritoneum, and, therefore, I would define the upper aspect of the clinical pelvic floor by the peritoneum covering it, the uterus and appendages being removed."

This means that the bladder, vaginal walls, and greater part of the rectum are to be included in the pelvic floor.

Dr. Henry Coe (2) also includes the bladder and rectum in the pelvic floor. This is undoubtedly a convenient definition from an obstetric point of view, but I cannot agree with Dr. Hart's premises in the statement quoted. The peritoneum does not outline the inner surface of the abdomen; otherwise such structures as the ascending and descending colon, the kidneys and spleen must be held to form part of the abdominal walls. The transversalis fascia defines the inner surface of the abdomen (3) and is continued into the pelvis as the obturator and recto-vesical fascia. The latter with its descending layer (4) helps to define the pelvic floor as it is described by Professor Symington. (5)

(4) Quain's Anatomy. 10th Ed.
(5) Loc. cit.
As his description is the more convenient one from a surgical stand-point, I shall adhere to it, in the following remarks on the anatomy of prolapse. One point however, requires to be cleared up. Professor Symington only refers to the anterior vaginal wall as it appears in his second section, these sections being cut transversely at right angles to the plane of the floor. This cuts the anterior wall about its middle, and at that point he prefers to consider it as lying above the floor. With this I agree, but from that point downwards would include it in the floor.

Cross sections through the upper part of the vagina - probably its upper half - show it as a transverse or crescentic slit. The lower portion similarly treated appears H shaped. It is, I think, reasonable to infer that it is compressed into this shape by the surrounding structures in the pelvic floor. The lower compressed portion of the vagina I should include in the floor.

The levatores ani, as the most important muscles in the pelvic floor, require a short description. Each consists of two portions - the pubo-coccygeus and the obturator- coccygeus. These - I quote freely from Prof. Symington's paper differ not only

(2) Savage. The Surgery, Surgical Pathology and Surgical Anatomy of the Female Pelvic organs, 5th Ed.
(3) Loc. cit.
in their arrangement, but also in their function.

The fibres of the pubo-coccygeus have a general antero-posterior direction. It arises from the back of the body of the pubis by tendinous fibres placed between, and intimately adherent to the attachments of the recto-vesical fascia above, and the obturator fascia below, and from the posterior layer of the triangular ligament. There is apparently a distinct interval between the right and left muscles at their origin. Its fibres pass backward on the side of the lower part of the vagina and on the side of the anal canal to the last two pieces of the coccyx. A few of the inner fibres meet and decussate with those of the opposite muscle in the perineal body; and between the anus and the coccyx is a similar blending of fibres from opposite sides.

The obturato-coccygeus arises from the pelvic fascia along the line of origin of the recto-vesical fascia and from the ischial spine. From this origin its fibres converge to be inserted into the lateral margin of the coccyx.

The pubo-coccygei act as sphincters of the lower part of the vagina and of the anal canal; but they cannot compress the upper part of the vagina, nor

(1) Quain. Loc. cit. p. 343.
(2) Hart's Atlas of Female Pelvic Anatomy, Plate XVIII, Fig. 2.
(3) Quain. Loc. cit. p. 343.
the rectum. They also draw upwards and forwards the perineal body and coccyx.

The obturato-coccygei have no direct action upon any of the pelvic viscera. They raise the coccyx and can elevate the pelvic floor a little after it has been depressed.

Shortly then, the pelvic floor consists of the levatores ani, covered by the descending layer of the recto-vesical fascia, filling in the outlet of the pelvis from front to back, and from side to side, with the exception of the two mesial faults. The anterior of these extends from their point of origin at the symphysis pubis, backwards to the decussation of their fibres in the perineal body; the posterior lies between the perineal and ano-coccygeal bodies. These faults are strengthened by the following structures from before backwards, pelvic or obturator fascia, anterior and posterior layers of triangular ligament, the muscular urethral walls, the firm tissue of the urethro-vaginal septum, the lower portion of the vaginal walls with the sphincter vaginae, the connective tissue attaching them laterally to the pubo-coccygeal portion of the levatores ani, and the perineal body with the muscles attached to it. The posterior fault is occupied by the sphincter muscles of the anus, with the external of which, fibres from

the pubo-coccygei are closely connected. Between these structures and the external skin boundary lie the vestibular bulbs, fat of the vulvae and ischio-rectal fossae, connective and areolar tissue, nerves, blood-vessels, and a portion of the glutæus maximus muscle.

In the mesial line where the pelvic floor is weakened by the vulval and anal clefts, Symington gives the average thickness as one inch.
ANATOMY OF PROLAPSUS UTERI.

I would suggest including uterine prolapse, cystocele and rectocele under one general term - Hernia through the Vaginal Ring. This is not a good use of the word "ring," but "canal" used in its place would introduce complications. Dr. Hart's term, "Sacro-pubic hernia," is not sufficiently definite for descriptive purposes, and would include all the half-dozen different varieties of pelvic herniae mentioned in Surgical works. The term "Vaginal Ring" will, I think, tend towards simplicity and in the following pages I shall use it as synonymous with the "Hernial Canal."

The Vaginal Ring may be defined as a canal of irregular shape, piercing the anterior part of the pelvic floor, running obliquely from before, backwards and upwards. Its length is from one and a quarter to one and a half inches. It is bounded in front and above by the lower portion of the anterior vaginal wall, the urethro-vaginal septum, the urethral walls and pelvic fascia; behind and below by the lower part of the posterior vaginal wall, the perineal body and muscles inserted into it, the anal walls and sphincters, and the ano-coccygeal body, laterally by the puckered margins of the

(1) Kelly says 4 to 5 cms. (2 inches), "Operative Gynecology", Vol. i. p. 204.
vaginal walls, bulbo-cavernosi muscles and bulbs of vagina, connective tissue and the inner margins of the pubo-coccygeal portion of the levatores ani, covered by the thinned-out parietal layer of the recto-vesical fascia. The triangular ligament which is pierced by the ring may also be mentioned as an important lateral relation.

The vaginal walls above the ring expand to form a transverse or crescentic slit, which runs backwards and upwards in the same straight line as the ring. The anterior wall is attached to the base of the bladder by loose cellular tissue, and the posterior is similarly, though not so firmly, attached to the surface of the pelvic floor and rectum.

The Vaginal Ring is the main source of weakness in the pelvic floor, and is, therefore, that portion of it which most frequently forms the canal of a hernial protrusion. Its strength lies in its length and its oblique direction, both of which are principally maintained by the forward traction exercised by the pubo-coccygeal portions of the levatores ani on its lower and posterior relations. This traction keeps the walls in their normal state of close apposition, and the ordinary intra-pelvic

pressure acting at a disadvantage on account of the obliquity, only serves to further maintain this apposition.

(1)
Kelly in speaking of this muscle says it controls the outlet, and prevents prolapse in three ways; by retaining the outlet in a forward position under the pubic arch, out of the line of abdominal pressure; by giving to the outlet the size and form of a narrow slit, and by directing the axis forward, so that intra-abdominal pressure strikes the pelvic floor at a right angle. The pressure which acts on the pelvic floor at a right angle will act on the normal vaginal ring at an angle of some 30 degrees.

These supporting muscles of the ring are liable to damage chiefly as the result of parturition, tears occurring either in the middle line posteriorly, thus dividing the decussating fibres in the perineal body, or laterally severing the muscular fibres in their length on one or both sides, or the damage may consist in the overstretching and consequent loss of tone on one or both sides.

It is evident that mesial tears will have but little effect upon the action of the muscles, as they would still have a point of application through their insertion into the sphincter-ani, and the so

(1) "Operative Gynecology," Vol. i. p. 508.
called ano-coccygeal body. Lateral tears and overstretching, on the other hand, at once throw one or both muscles out of gear, and there is produced the condition so ably described by Kelly as relaxed vaginal outlet. The result of this upon the vaginal ring is to diminish its length and do away with its obliquity, and it comes to form a lax aperture, opening at right angles through the pelvic floor. Its position also is altered. Instead of being braced up under the pubic arch, it has sagged backwards, and so is more than ever exposed to the effects of intrapelvic pressure.

The viscera which most frequently take part in this hernia, are the uterus (prolapsus uteri) and the bladder (cystocele); more rarely the rectum (rectocele) and coils of intestine (enterocele). The two first usually occur together, but cases have been noted, where the uterine prolapse was unaccompanied by any descent of the bladder— the connections between the two having become separated. The last form has been noted as occurring independently of uterine prolapse. For obvious reasons only the last variety is provided with a peritoneal sac, and in the case of the cervix uteri, even coverings are wanting.

(2) John3 Hopkins "Hospital report in Gynecology." Vol. iii. p. 311.
The coverings are formed by the upper part of the vaginal walls, but in extreme cases, the lower part of the walls may also be torn down and everted to form coverings.

The behaviour of the peritoneum in prolapse of the uterus is an interesting and important point. There are, however, few published facts concerning it, either anatomical or clinical. With every prolapse there is naturally some descent of intestines, but to what extent a peritoneal sac is pushed down and permanently fixed by adhesions it is impossible as yet to say. In the specimen belonging to Professor Symington, previously alluded to, Dr. (3) Tennant found a peritoneal sac behind the uterus reaching to within one cm. of the skin over the perineum.

(1) & (2) Hart and Barbour. Loc. cit. p. 607.
MECHANISM OF PROLAPSE.

The uterus as a hernial content is peculiar in having not only peritoneal ligaments, but also muscular supports, and further, derives support from the cellular tissue attachments of the upper part of the Vagina to the rectum and pelvic floor. These supports are not sufficient in themselves to retain the uterus at its normal level - the pelvic floor being required as a buffer to resist the effects of gravity and intra-abdominal pressure. Given a relaxed condition of the vaginal ring prolapse is a natural sequence.

These ligaments and fascial connections are usually subjected to a gradual stretching and separation, but their insufficiency is shown by the occasional occurrence of the so called "acute prolapse" where, as the result of the sudden strain, the entire uterus has appeared outside the vulvae. In such a case it may be presumed that the muscles of the pelvic floor have been taken unawares.

The normal position of the uterus in the pelvis is one of retroposition and anteversion. This is opposed to the occurrence of prolapse inasmuch as the intra-abdominal pressure tends to force it against the posterior and stronger part of the

pelvic floor.

As the uterus descends, it slips forward along the curve of the floor, and comes to lie more directly over the hernial canal.

Further, in its descent, its long axis follows that of the pelvic canal, and eventually corresponds with that of the hernial canal, its anteversion being replaced by a degree of retroversion. This slipping forward of the uterus renders the upper portion of the vaginal walls slack, the anterior usually prolapsing in front of the cervix, and carrying a portion of the bladder with it. The posterior wall usually follows the cervix, but may, in rare cases, appear in advance of it.

PATHOLOGICAL CHANGES IN COVERINGS AND CONTENTS OF THE HERNIA.

As in other herniae, changes occur in consequence of the disturbed relations and blood supply. The coverings differ from those of other herniae, not only in having no outside skin envelope, but also in having the exposed surface - the vaginal mucous membrane - greatly altered in relation to its blood supply. Thus in an advanced prolapse we have a congested and swollen mucous surface exposed to

(1) Kelly. Loc. cit. Fig. 289.
friction: The natural result is the appearance of excoriations and ulcerations, and the mucous membrane loses its rugosity and becomes hypertrophied and callous.

The same conditions apply to the cervix, which usually undergoes considerable enlargement, and cases have been noted where the congestion has given rise to considerable haemorrhage. The body of the uterus may share in the congestion and enlargement.

The bladder is usually represented in the hernial contents by a lobe or diverticulum. In this urine tends to accumulate and decompose, setting up cystitis. Calculi may form. Kelly mentions a case where one calculus was found in the hernial lobe and a second in the intra-pelvic portion of the bladder. Hydro-ureter and hydro-nephrosis may arise from involvement of the ureters.

ETIOLOGY.

(1) Treves concludes his remarks on the Etiology of herniae with the following quotation. "The principal cause of hernia would appear to reside in imperfection of structures which form the openings through which herniae pass." Though several authorities markedly emphasise other causes, few will question the applicability of this statement to prolapsus uteri. Drs. Hart and Barbour give increased intra-abdominal pressure as the most important cause and classify deficiencies in the hernial canal as adjuvants. Intra-abdominal pressure is undoubtedly the main factor in the production of the so called acute cases; but in a considerable number of the ordinary type it might almost be regarded as a constant, and so eliminated. On the other hand, I believe that the daily variations in abdominal pressure are, on the average, greater in the female than in the male. The abdominal muscles of the former are not, as a rule, in a state to keep up that firm, healthy tension which is met with in the more athletic male; and a woman's proverbial habit of constipation tends to excessive straining at stool.

Professor Simpson alludes to the supra-pelvic pressure consequent upon relaxation of the

abdominal walls, where the intestines are found bulging the lower part of the abdominal walls.

This configuration is also found in the male. Where it exists there is a liability to other herniae, as well as to prolapse, on account of the atonicity of the belly muscles. My experience of such cases is that the pelvic floor shares in the general relaxation of the abdominal muscles, and is, on this account, pre-disposed to prolapse. Apart from injury, I believe that the muscles of the belly walls and those of the pelvic floor, act and react equally on each other, and that an unhealthy state of the one means an unhealthy state of the other. Acting upon this belief, I have relieved several cases of early or threatened prolapse, by insisting upon exercises aimed chiefly at strengthening the belly muscles.

The influence of parturition, as a factor, is very marked, so much so, indeed, that one is tempted to ask if prolapse ever occurs in the healthy, well formed nullipara. Shroeder quoting Weinberg, gives six cases in nulliparae out of one hundred and seventy four, and Scanzoni quoted in the same place, reports fifteen cases out of one hundred and fourteen. Nothing is said, however, as

(2) Ziemssin's Cyclopaedim of the Practice of Medicine, "1875, Vol. 10. p. 189.
to their age, condition or deformity.

I have already alluded to a case reported by Mundé, and other authors mention a few. In nearly all the cases, where no deformity exists, the prolapse has been due to some sudden strain or concussion taking the muscles of the pelvic floor unawares. The few "chronic" cases in otherwise healthy nulliparae seem to occur among those whose employment necessitates much standing in a forwardly inclined position, such as is seen in washer-women.

Several authors mention cases of congenital prolapse. Dr. J. W. Ballantyne reports three of these, each of which was associated with spina-bifida. Dr. Ballantyne believes that the spinal lesion is a causal factor in such cases.

Practically speaking, prolapse as it occurs in the normal nullipara may be limited to "acute" cases. The multiparae share with the nulliparae the liability to "acute" prolapse, and in addition a section of them has a practical monopoly of the ordinary "chronic" form. That section may reasonably be limited to those in whom disease or injury has produced a loss of resisting power in the supports of what I have called the "Vaginal Ring."

Among the many influences predisposing to this loss

of Tone, the following are sufficiently evident: Parturition, flat and otherwise deformed pelves, too frequent pregnancies, abortion and emaciating diseases.

Increased weight of the uterus probably predisposes to prolapse by stretching the uterosacral ligaments and the upper posterior attachments of the Vagina to the pelvic floor and rectum, thus allowing the uterus to slide forward into more direct line with the Vaginal Ring. The heavy post-partum, or the sub-involved uterus finds these attachments already stretched and slides forward upon a weakened and unresisting pelvic floor.

To these posterior uterine and vaginal supports I should attach considerable importance in the prevention of prolapse. They not only maintain the uterus in its normal state of retroposition, but greatly aid in maintaining its anteversion.

To what extent the other uterine ligaments are able to prevent prolapse is very doubtful, as even the firm attachment of a ventro-fixation will stretch in a comparatively short time, to allow of recurrence.

Borreman Jessett, loc. cit. p. 1149; and others.
CONDITIONS OF PROLAPSE.

Prolapse is practically always reducible. (1) Irreducible cases are very rare.

SYMPTOMS AND DIAGNOSIS.

Of the well-known symptoms and simple diagnosis I need say nothing here.

(1) Thorburn. loc. cit. p. 294.
TREATMENT.

Were this a monograph, I should be tempted to introduce a historical note at this point. It might well go back as far as the second century, when Soranus censured his colleagues for attempting to cure the condition by such methods as suspension by the feet for twenty-four hours, or fumigation of the exposed uterus with offensive substances, acting on the supposition that, like a living animal, it would seek to escape the foul odour; or, allowing mice and lizards to crawl over the exposed organ, in the hope of frightening it back to its place.

Such a note would be of considerable interest, but it is not within the scope of this paper.

In the following remarks, I shall avoid, as far as possible, statistics and details, and rather state the broad principles which I think should guide one in the treatment of prolapse.

I shall consider it under the following heads:

1. Prophylaxis.
2. Rest and Massage.

(1) Schroeder. loc. cit. p. 188.
3. Pessaries.
4. Operative Treatment.

(1). PROPHYLAXIS.

Prolapse differs from other herniae in that its starting point can usually be traced back to some definite injury, or series of injuries. That parturition should so often form a starting point is to some extent a reflection on the medical profession at large.

I cannot insist too strongly on the obligation devolving upon every practitioner to leave no case of confinement, without first carefully ascertaining whether any injuries have been inflicted, and secondly, repairing these at once, or on the first possible opportunity. The vagina should in every case be carefully inspected in a good light.

Some two years ago, I attended an elderly primipara in a difficult confinement, and was surprised and pleased to find that the perineum had practically escaped damage; on inspecting the vaginal walls, however, I found a ragged tear occupying the left side of the vagina in three-quarters of its length. The retraction of the edges was sufficient to convince me that muscular fibres had been torn across. As there was no external evidence
of this serious condition, it might have easily escaped a casual inspection. Lateral vaginal tears are not great rarities, and I fancy that a considerable number of them is missed by the practitioner or nurse in attendance. In two recent cases of prolapse, I found a scar in a similar position.

The above case gave a satisfactory result from buried continuous and superficial interrupted (1) sutures of fine silk. Kelly alludes to the serious nature of such injuries as being the cause of "relaxed vaginal outlet," and insists upon the necessity for immediate repair. He recommends interrupted sutures of silkworm gut.

(2)

Several authors describe a submucous rupture of muscular fibres occurring during labour, and producing lesions similar to those resulting from a lateral tear. If such a condition were recognised at the time, I think an attempt should be made to approximate the torn ends. Two or three deep sutures passed so as to include only half an inch of the vaginal wall, but two inches or more of the subjacent connective tissue and muscular fibres would in any case do no harm.

When, after labour, the pelvic structures are slow in regaining their normal state, further

(1) Loc. cit. p.207.
rest in bed should be insisted upon.

(2). REST AND MASSAGE.

Many cases of prolapse due to relaxation of the pelvic muscles, without actual rupture, will benefit greatly from a course of rest and abdominal massage.

This class of prolapse may be associated with such various conditions as subinvolution following abortion or parturition, too frequent pregnancies, overstretching of muscular fibre, and emaciation from disease or old age. A careful selection of cases is therefore necessary, as only those whose recuperative powers are still good will derive much benefit. In most cases the treatment should be combined with a course of hot douching and the use of glycerine or ichthyol pessaries. This acts not only by relieving local congestion, but also by stimulating the adjacent muscles and improving their circulation.

Mrs. M., whom I saw two years ago, is a typical case. She was a nervous, energetic woman, aged thirty years, with many social and other cares. Since the birth of her only child three years before, she had lost about a stone or more in weight. For
about two years she had suffered from prolapse, and during the last two or three months of this time the ring pessary which she wore had been frequently expelled from the vagina. On examination I found the cervix on a level with the vaginal outlet, and the anterior vaginal wall showing on separation of the labia. The uterus was slightly enlarged. There was, however, no backward displacement of the anus, or flattening of the cleft of the buttocks, such as Kelly associates with relaxed vaginal outlet. There was no evidence of injury to the vaginal walls, and the perineum was intact. The abdominal walls were relaxed and flabby.

She stayed in bed for a fortnight, was subjected to abdominal massage and had a hot vaginal douche twice daily, and had inserted every second night a pessary of 10 per cent. ichthyol in glycerine. Her improvement was rapid. At the end of a fortnight I inserted a ring pessary of the same size as she had previously worn, and allowed her to gradually resume her duties.

She has had no further trouble during the last two years. I recently persuaded her to go without the pessary for ten days. There seemed

to be no tendency to a return of the prolapse, but as
she felt more "secure" with the ring in, I replaced
it. Her actual gain in weight during the two years,
is not more than half-a-stone.

I have had no experience of the Swedish
methods of massage, which are said to have been so
successful in the hands of Brandt; nor can I, after
a careful study of the literature, see any special
advantage to be derived from them. On the other
hand, I have in several cases used with advantage,
exercises for the abdominal and pelvic muscles
similar to those suggested by Dr. Savage.

(3). PESSARIES.

Pessaries are described by many authors
under the head of palliative measures. In the
majority of cases, this classification is undoubtedly
correct; but in a few, I believe the pessary to be
actually a curative agent, just as a truss will, in
some cases, cure inguinal hernia. Cases like that
of Mrs. M, quoted above, point to their having
something more than a merely palliative effect.

Dr. Barnes in introducing this subject
says, "It is one of the many controverted points in
Gynecology whether the use of pessaries in prolapse

(2) "Clinical History of the Diseases of Women. 1873. p.650.
is, or is not, a scientific proceeding. If pessaries are found useful, it matters little whether they satisfy the conditions of science."

To my mind, it is not a difficult matter to establish the pessary - more especially the intravaginal forms - on a scientific footing. To do this, it is necessary to show that it is supporting the hernia in accordance with nature's mechanical principles, and that it is not tending to dilate the hernial canal. To take the ring pessary as a type, there is plenty of clinical evidence to show that its tendency is to maintain the uterus in its normal position in the pelvis - to keep it retroposed, and to counteract retroversion. Further, it follows nature's principles by securing for the prolapsed organs as broad a base of support as possible on the posterior and stronger part of the pelvic floor. It lies in the oblique axis of the hernial canal with its broadest diameter resting on the pelvic floor behind the canal. From the description which I have given of the anatomy, it will also be evident that its dilating effects are exercised on the vaginal walls above the level of the hernial ring.

In my opinion, a well-fitting ring pessary

(1) Prof. Simpson - Allbut & Playfair's Sys. of Gynecology. 1896. page 419.
should lie entirely above the vaginal ring and pelvic floor. Its action is, therefore, to remove pressure from the hernial ring to an area further back, and so to allow the muscular structures supporting the hernial ring to recover their tone.

The various forms of air-ball pessaries may be said to act in a similar manner.

Ring or air-ball pessaries are, in my opinion, the best types, but where they are ineffective, recourse may be had to one of the vaginal stem pessaries. These, if carefully adjusted, do not tend to further dilatation of the vaginal ring. The stem should lie in the normal axis of the vaginal ring, that is to say, parallel to the plane of the brim. In fitting these pessaries, the principle I have endeavoured to follow is not that of giving direct support to the uterus from outside, but of throwing the uterine pressure to a point further back on the pelvic floor. Their action then comes to resemble that of the ring pessary. To attain this object it is evident that the upper end of the pessary should not be circular, but should be flattened antro-posteriorly and elongated transversely, as was originally suggested, I believe, by Professor
Simpson.

Most cases of prolapse where there is no rupture of muscular fibres will, if taken in time, be sufficiently relieved by a combination of these last two methods of treatment. Where these fail recourse must be had to operative measures. In old people and others, where operation is contra-indicated, some relief may be obtained from a perineal pad or band.

(1) Loc. cit, p. 408.
OPERATIVE TREATMENT.

The operative treatment of prolapsus uteri differs from that of other herniae in one main respect, which has been a serious stumbling block in this branch of surgery. It is necessary not only to repair the hernial canal, but also to support the prolapsed organ, or rather to divert its pressure away from the hernial canal. This diversion of pressure was at one time insisted upon by Mr. John Duncan in the case of inguinal hernia. He attempted, by altering the lie of the parietal peritoneum, to throw the pressure away from the internal abdominal ring.

This necessity for dealing directly with the prolapsed organ has been the origin of endless operations. Two of the most recent of these seem also the most fantastic. I refer to the submucous injection of paraffin, suggested by Mr. Stephen Paget, and the intra-ligamentous injection of a solution of quinine, carried out by Dr. Inglis Parsons.

The former method may find a range of utility in old women who have passed the menopause, but the reasons against its use in younger women are

apparent. For the latter method I can find no excuse. I should have thought that the numerous reflex troubles which are associated with chronic inflammatory contraction of the uterine ligaments would have been sufficient to deter any man from deliberately causing such a condition for the cure of any other.

Other operations for the direct support of the prolapsed organs will be referred to below.

In recent cases, where the prolapse is not advanced, it is frequently sufficient to restore the vaginal ring, or, in addition to this restoration, to temporarily insert a ring pessary. In advanced cases, a radical operation must include some method of fixing the uterus, so that it will not press upon the restored ring, and also some method of dealing with the sac of peritoneum which descends in front of the rectum.

Thus, operations in advanced cases may be divided into two stages – firstly, that which deals directly with the prolapsed organs or their coverings; and secondly, the restoration of the hernial canal.

These stages are, in the hands of many surgeons, reversed or mixed. This division of operative procedures into stages enables me to include practically all the controversial matter in a discussion of the first stage.
But first let me ask, is there any broad general principle which will help to clear a path through the numerous procedures in vogue? Nature's provision for the prevention of prolapse has not yet been equalled, much less excelled, by operation; and I think a general principle may be found in a close approximation to her methods. Her methods of defeating the effects of intra-abdominal pressure may, I think, be found in the length and obliquity of the hernial canal, and in the retroposition and anteversion of the uterus.

The guiding principle, therefore, of the first stage is, to restore the backward position and forward inclination of the uterus, and of the second stage, to maintain the length and obliquity of the vaginal ring.

FIRST STAGE:

Under this head, I must first mention two preliminary operations which are frequently necessary on account of the altered and unhealthy state of the uterus; but which do not, in my opinion, form any part of a radical cure: these are curetting and cervical amputations. Where time is not an important object, these operations might be replaced by, or, if necessary, combined with, a preliminary ten days rest in bed, under appropriate treatment.
The principal operations in this stage may be referred to under the following heads:

Vaginal Fixation of the uterus; Ventri-
fixation; Operations on Uterine Ligaments, and last-
ly, Operations on the upper part of the Vaginal Walls.

With these I shall deal very shortly.

Vaginal Fixation for prolapse, or indeed, for any form of uterine displacement, has been, I believe, generally discarded in this country, and need not, therefore, be discussed.

Ventrifixation is still supported by so many author-
ities that I have some hesitation in expressing my opinion. Among those taking part in the discussion on prolapsus uteri at the British Medical Association meeting of 1902, a majority favoured it, in advanced cases. Kelly thinks that a decided mechanical advantage is obtained by it in bad cases. But is it a scientific operation in prolapse? It will not stand the test of the principles I have suggested for this stage. It may certainly be performed so as to maintain the anteversion of the uterus, but it as certainly undoes the retroposition of that organ, dragging it forwards into the direct line of vertical abdominal pressure, and still further stretching its posterior attachments. Its effect on prolapse of

(1) Loc. cit. p.513.
the vaginal walls is either none at all, or it
tends to aggravate the condition by bringing the
upper part of the vagina more directly over the her-
nial canal. I am inclined to think that the range
of utility open to this operation is small, and that
time will only tend to further curtail it.

Operations on the uterine ligaments: The
same criticism applies, though to a less extent, to
such operations as Alexander-Adam's and Olshausen's,
but the chief objection to these lies in their having
proved ineffective in the hands of all but a few
surgeons.

The suggestion by Bowreman Jesset to take
several tucks in the utero-sacral ligaments, more
nearly fulfils the principles of this stage, though
such an operation is more apt to cause a forward
flexion than a version. It is also doubtful if the
ligaments, when tucked, will act as more than a tem-
porary support.

Operations on the upper part of the Vaginal Walls:

Those operations which aim at reducing the
natural calibre of the upper part of the vagina were
certainly not copied from nature, since the normal,
expanded upper vagina trusts for its support, not to
the narrowness of its lumen, but to the breadth of

(1) McCann B. M. J. 1902, V.2, p.1149. and
Bowreman Jessett on the same page.

(2) Loc. cit.
its adhesions to the surrounding connective tissue. Even in cases where the walls have been greatly stretched to form the coverings of a large procident uterus, appropriate preliminary treatment will cause a marked contraction.

On the other hand, operations which aim at achieving the necessary support, not from a reduction of calibre, but by restoring the connective tissue attachments of the upper vagina, are working on natural lines. It is an extension of this principle that I believe the best support is to be found, and it forms the basis of the operation which I advocate. Before discussing it, let me refer to one other procedure, carried out by Mr. Stanmore Bishop. He opens the abdomen in the middle line; the uterus is drawn forward out of the way, and the posterior fornix elevated by means of a pair of elbowed forceps in the vagina. From within the abdomen he then passes two sutures through the summit of vagina, attaching it at the requisite height to the peritoneum, over the sacrum. This operation secures a natural position of the uterus in a natural way.

Despite its magnitude I should consider this a good operation if it can be shown that the peritoneum over the sacrum is sufficiently resistant

(1) B. M. J. 1902 Vol. II, p.1151
to give the necessary support.

The operation which I have to propose for this stage I combined with a restoration of the vaginal outlet after Kelly's method. It differs on the two sides of the vagina; on the left side an incision through the whole thickness of the posterior wall is carried up the side of the wall for three-quarters of its length; a similar incision on the right side extends to near the summit of the vagina in the outer part of the posterior fornix. In making the latter incision, in the case of Mrs. L., I found it impossible to separate off and carry before me the peritoneal sac which had descended in front of the rectum, without opening into it. In a majority of cases, however, I can imagine it would be necessary to open into the sac. Through the incision on the right side, the sac is, as far as possible, separated and pushed up. With a guiding finger or bougie in the rectum, the incised fornix is then pushed backwards and upwards and carried to the right, until it lies comfortably on the recto-vesical fascia covering the posterior part of the levator ani near its fascial origin. In this position it is steadied by a pair of long forceps held by an assistant. The long forceps I found considerably in the way, so replaced them by

(1) Loc. cit. p.222
two pairs of Kocher's forceps, gripping the fascia and fibres of the levator ani below, and the outer edge of the incision above. A medium full-curved needle is then used to stitch the upper inch of the incision to the fascia and muscular fibres, three or four interrupted sutures of fine silk being placed and tied. The use of silver wire would shorten this part of the operation, as I found considerable difficulty in tying the silk. The rest of the incision, down to the resection at the outlet, is closed by a continuous silk suture embracing its edges and taking a good grip of the underlying connective tissue. The shorter incision on the left side is treated in the same way as the lower part of that on the right. The rectum is thus allowed room on the left side for possible overloading. If drainage seems advisable on account of the interference with the peritoneal sac, it should be secured through a separate opening in the posterior fornix.

Mrs. L., whom I have referred to in connection with this operation, was 37 years of age. She had two children. Ever since the birth of the eldest, eight years before, she had suffered from marked prolapse with a large cystocele. On examination, the vaginal outlet was found in a typically relaxed condition, and scar tissue was plainly vis-
ible on the left side of the vagina. On straining, a large cystocele showed itself and the cervix protruded beyond the vaginal outlet. The uterus was enlarged, the cervix being considerably hypertrophied and the uterine canal measuring four and a half inches. The pelvis was large and well formed, and the vagina roomy. I operated upon her by the above method, on 1st November, 1902. A preliminary curettting and amputation of the cervix was rendered necessary by the state of the uterus. The operation was completed by a resection of the vaginal outlet, after the method described by Kelly. I had an opportunity of examining her ten months afterwards. The uterus was then in good position, and showed no tendency to prolapse. Neither the uterus nor the vagina showed any lateral deviation. There was no trace to be felt of the stitches in the posterior fornix. The cystocele had not entirely disappeared. For this I inserted a diaphragmatic ring pessary, and have since heard that she is absolutely comfortable.

In a less roomy vagina the insertion of the upper sutures would prove a difficult matter, and would have to be carried out entirely by touch. From experiments made on the cadaver, I think it may be possible to facilitate this part of the operation.
by the introduction of two fingers through an incision above the outer half of Poupart's ligament.

SECOND STAGE:

This consists in the restoration of the vaginal ring. The points to be observed are the maintenance or increase of its normal length and obliquity. As a typical operative procedure, I should cite Kelly's description (1) of his "resection of the vaginal outlet" which is based upon Emmet's operation (2) of more than twenty years ago. In it the length of the canal is maintained, and its obliquity is increased by an alteration of its axis. I need not further discuss the procedure in this stage, as to do so would simply mean quoting Kelly or recapitulating.

I have purposely avoided reference to the operation known as Anterior Colporrhaphy, because I believe that the need of it will be overcome by a scientific adjustments of the supports in the first stage. In advanced cases of cystocele, however, it may still be necessary.

No reference is required here to the last resort - hysterectomy. The most cunningly devised operations in Surgery will always have a certain percentage of cases outside their limits. Neither need I refer to the still more drastic measures proposed.

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(1) Loc cit. p.222.
(2) Principles and Practice of Gynecology. Lon.1879
in this country, by Mr. Martin of Birmingham, and in America by Dr. Edibohls of New York.
The following does not represent the literature of the subject, but includes most of what has been referred to and consulted in the preparation of this paper.


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