Observations on Prolapsus Uteri, *with reference to the Modus Operandi of Dr. Hull's "Utero Abdominal Supporter."* By John F. Gray, M. D., *Delegate from the County of New-York.*

Down to the time of the invention of the Apparatus of the late Dr. A. G. Hull, for the cure of prolapsus of the uterus by external pressure, in 1832, the universally received opinion respecting the mechanical cause of that malady was, that it was relaxation of the parts called in descriptive anatomy, *uterine ligaments.*

It is suprising that this opinion should have continued to sway the minds and practice of the medical profession for so long a period of time, during which, and especially within the last century, the science of anatomy, and consequently surgery, have undergone such striking and brilliant changes.

Our surprise is by no means diminished by the consideration that the very latest and most eminent writers upon diseases of females, after either plainly or indirectly admitting that the uterus is not held *in situ* by means of its so called ligaments, as is abundantly demonstrated by all modern anatomical researches connected with the subject, have in every instance failed to apply the natural and essentially just inference from this admission, to the etiology and mechanical cure of prolapsus uteri. Vide J. Burns, Davis, Sir Charles Clarke, Dewees, S. Cooper, M. Gardien, Mad. Boivin, and others who have written on this subject within the past twenty years. Prof. James Hamilton of Edinburgh is an exception to this charge; *but he wrote his observations on this subject in* 1836, *four years after Dr. Hull commenced his invention, and two years after its publication*

If we follow the safe method of testing pathology by

anatomical axioms, and of correcting it as fast as anatomy advances, there certainly can be no material error, as far at least as mechanical causes and merely mechanical expedients are concerned. This should be done by the profession in regard to prolapsus of the womb, and it is a matter of reproach that sound and efficient deviations from the immemorial and unsatisfactory use of pessaries were not sooner adopted and universally known.

That the uterus is not held *in situ* by the loose large duplicatures of the peritoneum, called broad ligaments, (*ligamenta lata uteri*) is evident from the fact, that this membrane is there, as in every portion of the abdomen, thin, weak and yielding in structure, so much so as by no means to serve the office of a ligament, and least of all a suspensory ligament, as Dr. Davis calls it. (*Principles and Practice of Obstetric Medicine*, p. 500.)

To prevent a prolapsus uteri by suspensory ligaments, such apparatus should be attached firmly to some fixed point above the viscus; and as all the front paries of the abdomen above the fundus uteri is muscular, and constantly shifting position, if the supposed suspension had been necessary, it would have been effected by one or more ligamentous bands, extending upwards to the ribs, sternum or lumbar vertebræ. And even such an apparatus would have failed in its office whenever the trunk was bowed upon the pelvis, unless endowed with muscular contractility and made to act in synchronism with the great flexors of the trunk.

Certainly that portion of the peritoneum which is as it were thrown like a loose thin canopy over the top of the pelvic viscera, possesses none of these characteristics. It would seem also that the secerning office of the peritoneum, rendering it in the eye of the physiologist, a delicate glandular expanse, should have prevented pathologists from lightly ascribing to it the utterly distinct and rude offices of ligamentous structure. Nor can the round

ligaments, whatever other office they may perform, be said to act as suspensories to the womb. They go off from the fundus uteri to the mons veneris in a nearly horizontal direction; they describe a loose curve, and by no means upon the stretch; and they are not muscular. They may possibly act as suspensories in cases of complete prolapsus, where the uterus is pendulous between the thighs, but certainly in no other case.

Dewees and many other writers of eminence have ascribed to the vagina the station of an important adjuvant to the ligaments, in keeping the womb in place. But it is well known that relaxation, or rather procidentia of the vagina not unfrequently occurs, independently of prolapsus uteri, and it may fairly be questioned whether the folding and descent of the vagina in the latter case, are not in all cases *always* in the relation of effect to cause. Besides, it is affirmed by Professor Hamilton, upon apparently indisputable authority, that laceration of the perineum is always followed by prolapsus uteri, a fact which goes very far to disprove the idea that the vagina takes any great share of the support of the uterus. The structure and condition of the vagina, a flexible and collapsed passage, would also appear to preclude this hypothesis.

Mad. Boivin thinks prolapsus in its incipient stage is owing to relaxation or elongation of the utero-sacral ligaments. (*A Practical Treatise on Diseases of the Uterus* by Mad. Boivin. Heming's translation, p. 43.)

Meckel advances the idea that the uterus is kept in place by muscular fibres, going from the sides of that viscus into the adjacent peritoneal folds and the round ligaments. But the existence of these muscular fibres requires certainly farther confirmation than is afforded by the obscure author from whom Meckel cites. (*Doane's Meckel*, vol. iii. p. 403.)

Still, how could these minute short fibres going from the womb laterally into the loose, thin folds of the peri-

toneum, lift or suspend that viscus, or prevent its descent? They could not lift the womb up unless inserted above its fundus, and that to a comparatively fixed structure, neither of which conditions exist. If they were to move the uterus at all, it would necessarily be to move it laterally, but it should seem that their contraction would be much more apt to approximate the peritoneal folds nearer to the womb, than to stir that much heavier body from its position; In fact Meckel himself says in another paragraph, that these fibres in question draw the ovaria into contact with the fimbria. (*Loc. cit. ibid.*)

The same objection invalidates the supposed suspending action of the round ligaments, admitting their muscularity, that has been above applied in reference to them, to wit: that their point of attachment is not above their origin. The only action possible to ascribe to them in this case, would be that of preventing retroversio uteri. To arrive at a just notion of the mechanical cause of prolapsus of the uterus, we have only to ascertain by what means it is kept *in situ* during health. A question which, it appears to me, the present state of anatomical knowledge enables us to answer without the slightest difficulty or doubt.

The venerable Scarpa was the first physiologist to discontinue the received idea of the great force of the peritoneal folds, in the capacity of ligaments, and to furnish a clue to the occult cause of hernia; and his views on that intricate subject apply with equal force to the pelvic displacements, when taken in connection with what John Burns and Velpeau have written on the latter subjects. (*Traite des Hernies.*)

"In the healthy state," says Scarpa, the abdomen, considered altogether, is submitted to two opposite forces, which reciprocally balance each other. If these forces were in perfect equilibrium in all individuals, and under all the circumstances of life, we should not be in the least

subject to hernia. If when the equilibrium has been broken every part of the parietes of the belly were to yield equally to the impulse of the viscera, an increase of the volume of the whole abdomen would be the consequence; but a true hernia would never happen. The cavity of the abdomen is always completely full."

The containing and contained parts react upon and reciprocally compress each other. It is by the effect of this moderate but equal and unremitting pressure, that all the viscera mutually support each other. Without it the ligaments of the liver, those of the spleen, and the various membranous bands of the intestines in general, would only be feeble means for fixing such parts in their respective situations.

But there is another antagonism besides that between the containing and contained parts to which he did not allude, which assuredly plays a very important part in keeping the viscera of the abdomen in their respective situations. I mean the antagonism between the diaphragm and the abdominal muscles. When by the act of inspiration the liver, stomach, spleen and intestines are propelled downwards by the diaphragm, sensibly, and to a considerable extent, how are they made to pursue the retreat of that septum, keeping all the time in close contact with it? They certainly are not dragged upwards by their ligaments. These delicate reflections of the peritoneum are by no means fitted for so rude a task. The whole abdominal viscera are manifestly kept in contact with each other, and with the receding diaphragm, by the action of the abdominal muscles, which give way as it descends, and pursue it by renewed contraction, as it retires; that is, act in constant antagonism with it.

The abdominal viscera, then, are kept *in situ* by an equilibrium in the muscular walls that surround them. The viscera are passive and extremely moveable, and depend for their contact and due relative locality upon the

forces exerted from without, upon them, by the containing parts. They possess no inherent power of changing or recovering locality. Accordingly we find that whenever from mechanical or internal causes, any portion of the muscular parieties of the abdomen is relaxed or weakened, that part assumes a fulness of form, the intestines being driven with unaccustomed force against its inner surface, and a proportionate diminution of capacity of another portion of the cavity taking place. In hernia of the groins, the epigastric region sinks in somewhat, and the iliac portion of the hypogastrium assumes a greater fullness than natural. Independently of natural hernia, there exists from the lower part of the oblique and straight muscles becoming relaxed, a great fullness of the whole hypogastrium, with a corresponding very palpable sinking of the epigastric and umbilical regions: a state which has been recognised by several writers, and which ought to be called internal or latent hernia.

This alteration of the relative situations of the viscera exists, according to my observation, in most cases of confirmed dyspepsia, and is very manifest by looking at the abdomen, when the patient is erect. Is it not possible that many cases of inveterate indigestion could be materially alleviated by assisting the hypogastric muscles by well-directed support?

That a dislocation of the intestines downwards, should be attended by a greater or less change of relative position in the viscera of the pelvis seems unavoidable; and if we assume that the levatores ani and coccygei muscles, which constitute the flooring of the pelvis, and which act synchronously with the hypogastric muscles, are relaxed and weakened at the same time, we have an ample explanation of the occurrence of prolapsus uteri, which appears to me very much more in accordance with sound medical logic than the prevailing doctrines.

If we consider the two cavities as one, (and they are

only divided by an anatomical fiction, being in reality but one) great cavity, closed above and below by two antagonist diaphragms, and then suppose the lower septum to have lost a portion of its resisting power, we should state the pathological problem presented by the malady in question, in a plain and perhaps unobjectionable manner.

Velpeau in a very perspicuous manner describes this antagonism, but ascribes the lower portion of it wholly to the transversales and coccygei muscles, (*Surgical Anatomy*, Dr. Sterling's translation, vol. i., p. 259,) whereas, it is certainly evident to any one taking the least pains to observe the respiratory motions of the abdominal muscles, that the hypogastrium constitutes as decided a part of the lower force as the perineum does.

From the observations I have made since this view of the nature of prolapsus occurred to me, now nearly four years, I am convinced that the hypogastric muscles are always more or less elongated or weakened in that disease. It appears to me not improbable that pelvic herniæ are produced by relaxation of the hypogastrium, independently of the perineum. It is easy to suppose, that the folds of the small intestines, upon losing part of the muscular support of the hypogastrium, would be pressed down into the pelvis by the dominant force from above, forming perineal hernia, or that by being pressed against the uterus, that viscus should be disturbed in its position, constituting retroversion, anteversion, or the lateral displacement spoken of by Meckel. (*Loco citato.*)

But the necessary result of a combined relaxation of both portions of the floor of the abdomen, the hypogastrium and perineum, would of course be a prolapsus of the uterus, connected with a corresponding sinking of the intestines, involving, most probably, to some extent, the stomach, liver and spleen.

The indications of cure growing out of this view of the nature of prolapsus, are:

I. To diminish the preternatural capacity of the hypogastric, and ano-perineal regions; and,

II. To restore tone to the muscular portions of those parts.

The first of these indications is answered by the ingenious apparatus of Dr. Hull, entitled by him, *Utero Abdominal Supporter*, which presses against the two weakened and distended points of the abdomen, with any required force, and at the same time preserves by its elasticity, the faculty of advancing and receding with the respiratory action of these parts. The second indication is also fulfilled to some extent by this instrument, by means of the well known sanatory influences of equal and uniform compression upon parts distended and weakened by forces from within. At any rate, it affords the weakened muscular and aponeurotic apparatus it covers, rest and opportunity to recover their lost tone; an object of so much importance in the estimation of Prof. Burns, Dr. Davis, and many other eminent writers on the subject, as to induce them to insist upon nearly absolute rest in a recumbent posture for a very long period of time.

I have had frequent opportunities during the past four or five years, of seeing the results of the late Dr. Hull's instrument, and they have been such as fully to justify the views I have set forth, and to convince me that the old and ever inefficient expedients of the recumbent posture, styptic injections, pessaries, &c., and the erroneous views upon which they are founded, will be exploded in a very short time.

The objections to the old practice become more apparent and palpable, when considered in connection with the views I have advanced.

I. *The Horizontal Posture.*—This is earnestly insisted upon by Prof. Burns, Sir Charles Clarke, M. Gardien,

and Dr. Davis of London, the most eminent recent writers on obstetric medicine. It is founded on the hypothesis of the ligaments, and cannot, it appears to me, prove serviceable in any great number of cases. It is possible that, in some instances, presenting great vigor of muscle, and fullness of the vascular system, the loss of appetite and general relaxation necessarily resulting from a rigid adherence to this irksome position, for two or three months, the shortest time named by Dr. Davis, might, by greatly reducing the upper forces of the abdomen, palliate the prolapsus to a considerable extent: But though the recumbent posture immediately relieves the patient from the dragging and bearing down which are especially distressing in the early appearance of the displacement, it is not to be forgotten, that a large majority of those subject to this malady, are, by no means, in a condition to sustain, without serious consequences, the prostration and general debility caused by persisting in it for any length of time. Indeed, the authors cited, one and all, condemn this treatment, in principle, by strongly insisting upon the use of means for invigorating the system, a loss of tone in which they consider the remote cause of the disease.

Dr. Davis affirms that the horizontal posture, "rigidly observed for two or three months, might possibly suffice to insure a restoration of the suspensory ligaments [which are they?] of the uterus to their former tone and strength." He offers no experience whatever in support of the prescription, nor does either of the other writers on the subject. It appears to be founded solely upon the prevalent but irrational supposition, that the peritoneal folds and round ligaments suspend the uterus, in the healthy state, and that relaxation in them is the proximate cause of prolapsus; and this pursuit of a hidden cause, which transcends the possible limits of testimony, in this, as in very many other cases in medicine, seems to take off the

attention from the plainest possible mandates of experience.

Professor Thompson asserts that this practice "tends not only to impair the general health, but also to aggravate the disease, by *increasing the relaxation of the natural supports of the womb; daily experience has established the validity of this opinion.*" Mad. Boivin does not recommend its adoption.

II. *Styptic Injections into the Vagina.*—This practice, so frequently followed by pernicious consequences in the treatment of leucorrheal discharges, is also recommended by the eminent authors above quoted.

It is difficult to conceive how the injection of astringents into the vagina, can restore tone to the round ligaments, or to the peritoneal folds, or corroborate their convalescence; yet such are the faculties ascribed to them. But it is easy to imagine that they may irritate the mucous membrane of the vagina, and suddenly dry up habitual discharges from it, to the very great detriment of the general health; and also excite serious indurations, and even ulcerations of the os uteri. Much indubitable testimony exists in the records of medicine to support the latter supposition, but so far as I am aware, none whatever in favor of the former. Is it not probable that both these expedients, the horizontal posture and the use of styptics, have been resorted to, successively, and after other means, because practitioners have been so constantly baffled in the treatment of the malady in question?

III. *Pessaries.*—After permitting the descent of the intestines upon the viscera to take place, without pathological recognition, it is not to be wondered at that the appearance of the uterus at the vulva should be regarded by the earliest surgeons as the result of relaxation of its upper connecting points; nor that its farther descent should be opposed by the introduction of a prop, or block, into the vagina, which, upon having its long diameter

arranged across that passage, should be incapable of expulsion through its outlet, thus presenting an effectual barrier against the exit of the womb from that part. But it is matter of surprize, as before stated, that the improvements in anatomical knowledge which the last century has developed should not have produced a better mode of curing prolapsus than was devised in the first and rudest stage of surgical invention.

The objections to the application of pessaries are:

1. They are not surgically indicated; they consequently never act as remedies, but merely palliatives in all cases, and like all other palliatives, they tend to perpetuate the necessity of their application during the life of the patient.

2. They distend the flooring of the pelvis and increase the capacity of the ano-perineal region, thus directly aggravating one essential and important element of the disease.

3. They provoke mucous discharges from the vagina, where they do not exist, and change the character and quantity of existing ones, much for the worse.

4. They occasionally produce serious inflammations. Velpeau relates a fatal peritonitis, produced by a pessary, introduced by himself. (*Surg. Anat.*, ii. p. 283.) They cannot be worn by many patients on account of the local and constitutional irritation they produce.

5. They are likely to hasten the development of latent schirrous affections of the os uteri, which are sometimes complicated with prolapsus, and perhaps more frequently than has been suspected. (S. Cooper quotes cases from Ruysch & Langenbeck, in his *Surgical Dictionary*, art. Prolap. Uteri.) This is a very strong objection to pessaries.

6. They interrupt sexual intercourse.

7. Numerous instances are related in surgical works, of pessaries becoming so encrusted and firmly imbedded

in the vagina, as to require serious operations to extract them.

8. Their proper application, the choice of their form and dimensions, so as to adapt them well to each case, is a point of much difficulty with the most expert surgeon. The majority of practitioners must find extreme difficulty in these respects.

The unsatisfactory results of ordinary methods, recently induced a practitioner of high character to undertake a radical cure, by obliterating the cavity of the vagina! Mr. Liston brought the sides of the vagina together by several ligatures. It is scarcely necessary to say, that this cruel experiment failed entirely. Professor Thompson sanctioned the attempt.

Dr. Marshall Hall has lately removed a strip of the mucous membrane, an inch and a half wide, from the whole length of the vagina, for the purpose of contracting the diameter of that canal so much as to prevent the descent of the womb through it. I mention these cases, not by any means as precedents worthy of imitation, but as showing conclusively the inefficiency of the prevailing practice in this disease, and the vagueness of the views upon which such practice is founded.

The method of Dr. Hull is liable to none of the objections enumerated, nor so far as I am able to judge is it objectionable in any regard. A large number of my professional colleagues in New-York have applied the new apparatus, and all, I believe, with gratifying success.

There is an important consideration in favor of the external mechanical support worthy of notice: this is its salutary influence in the flexions and lateral displacements of the fundus uteri not accompanied by prolapsus. It is probable, as before stated, that retroversion, anteversion, and the lateral dislocation of Meckel, are caused by a relaxation of the hypogastrium, permitting the small intestines to sink below the brim of the pelvis. The cir-

cular portion of Dr. Hull's Supporter would in this case be indicated, and doubtless prove successful. Farther experience will determine how far abortions from this condition may thus be averted. It is probable also that many distressing gastric affections, arising from dislodgement of the intestines, and ascribed to other causes, and particularly to morbid sympathy with the uterus, may be effectually removed by this apparatus. The same remark may be made in reference to affections of the urinary bladder. I have seen two cases of partial incontinence of urine, not connected with prolapsus, cured by this instrument. It was applied upon the supposition that the intestines compressed the bladder and diminished its capacity. The distended condition of the hypogastrium and hollowing of the upper part of the belly before spoken of, existed in both instances, and gave rise to the conjecture as to a mechanical cause.