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Anatomical
Dana Berry, Harv M.B.
Thesis for M.D. 1877
August 1880 and Some Surgical
Yellowup

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Introduction

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The following thesis is an attempt to consider the Female Pelvic Floor in its structural aspects. The deficient bony outlet of the pelvis is filled in by a thick fleshy layer known as the Pelvic Diaphragm or Pelvic Floor with the pelvic and abdominal viscera resting on it. This superincumbent mass is readily supported by the Male pelvic floor seeing it is structurally an unimpaired layer. The female pelvic floor however is not such an unimpaired layer as it has running in its midst the vagina which in parturition especially comes to be opened up to an extent almost coincident with the true bony pelvis itself. The question therefore may be asked what is really the architectural arrangement of this pelvic floor; how is it sufficient to support its superincumbent load of viscera & yet admit of the passage of the foetal head; what are the exact mechanical arrangements by

by which the vagina opens up in Parturition, in certain posture too. If the pelvic floor has really a definite structural arrangement, all changes in its shape, physiological & pathological should be definite: & all our instrumental means of exploring the recesses of this pelvic diaphragm should be based ^{on} its mechanical structure.

The object of the present inquiry then is to consider the female pelvic floor & its mechanical workings.

Part I

7.

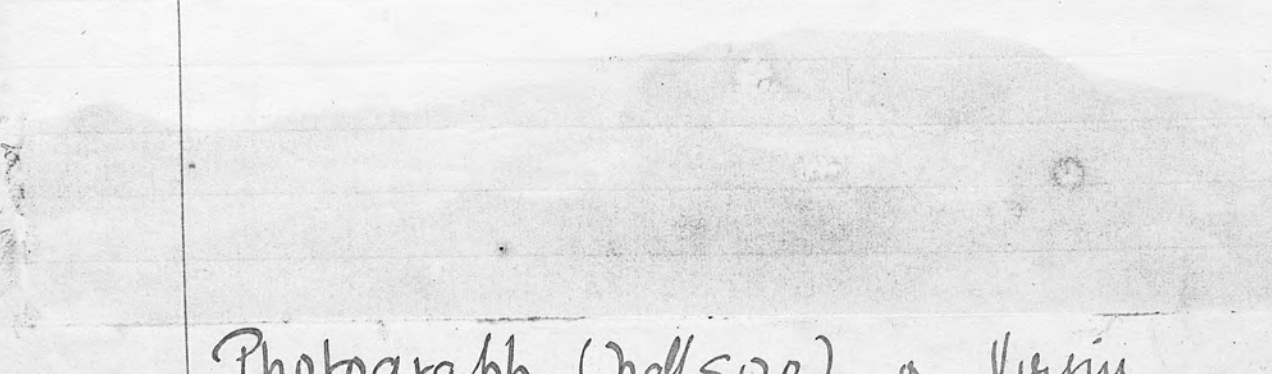


Photograph (half size) of Virgin
Anne's pelvis floor etc

Fig 1

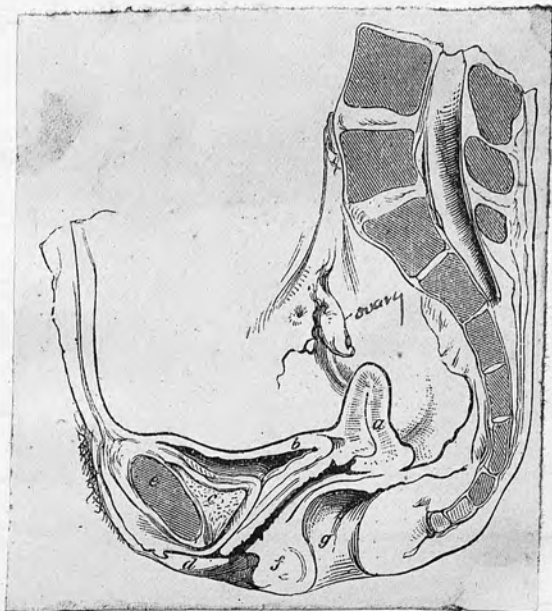


Fig. 2. Woodcut of preceding.

e Symphysis Pubis

d Labium Majus

c Retropubic fat triangle

b Bladder

a Uterus & pelvis

f Rectum

The red line running in the Vagina separates the Pelvic floor into its
Pubic & Sacral segments

The Closed Pelvic Floor.

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The Structural Anatomy of the Female Pelvic Floor in Sagittal Meridional Section.

The photograph on the opposite page shows the pelvis of a virgin in meridional sagittal section. Stretching from pubis to sacrum we have the pelvic diaphragm shown in undisturbed relations unless it be the inevitable opening up of the anus & the admission of air thereby. What is thus seen we shall now take up serially.

The anus being imagined closed as in life, it will be evident on inspection that the fleshy diaphragm stretching from pubis to sacrum is ^{a compact} an ~~unbroken~~ one. Traversing it we have 3 'slits' or 'faults' - the Urethra, vagina & anus.

The Urethra is practically a capillary slit, its sides being in close apposition.

The anus is closed by its strong muscular sphincter.

Neither of these then it is evident in any way impairs the structural efficiency of the floor. The Vagina as shown here is a mere slit. Its walls anterior & posterior are in accurate apposition & are always so in every posture in the living woman. If in such a vertical section the vaginal walls be separated it will be found that the slit is deeper above than below ^{that its walls} are ^{are} rufous & that the vagina in the entire pelvis ^{has} ~~have~~ the shape figured below.

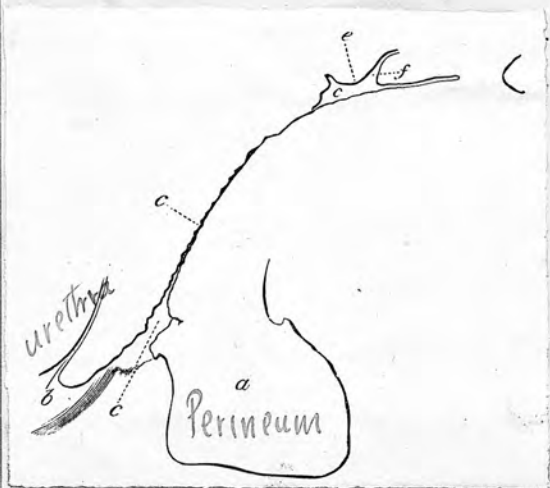


Fig 3 life size drawing of
Vagina in vertical section

Fig 4

Now further the urethra & vagina run obliquely to the pelvic floor or more precisely as the figures (1+2) show, from parallel to the plane of the brims.

The vagina therefore is a mere slit in ventral section

This "Vaginal slit" forms a natural division of the floor into two halves. This is not a mere convenient division but one based as we shall see on anatomical structure & function.

For ease of description we shall speak of the
Pubic Segment of the Pelvic Floor
 and the
Sacral Segment of the Pelvic Floor

The Pubic Segment consists of what extends from symphysis pubis to anteri. or vaginal wall, including of the latter and is chiefly made up of bladder.
 The Sacral segment makes up the rest

of the floor & extends from Sacrum
to posterior vaginal wall

author's Division
of Pelvic
Floor.

The Pubic Segment of the Pelvic
Floor is evidently triangular in shape
when viewed in vertical section &
& has a pubic, vaginal & perineal
aspects

The pubic side is separated from the
posterior aspect of the symphysis pubis
by a pyramidal deposit of loose fat
in this way a plug up & down of the
segment is evidently arranged for. The
nature of the perineal & vaginal aspect
is evident from inspection. Their re-
spective lengths in the first photograph
are (multiplied by two)

Pubic side	6 cm.
Perineal side	7½ cm.
Vaginal side	6-7 cm.

It should be specially noted that the anterior
or vaginal is closely incorporated with
the posterior wall of the bladder &
urethra

The Pubic Segment of the Pelvis floor is thus loose in texture, has only a loose bony attachment & is evidently arranged for mobility in almost any direction.

The Sacral Segment has been already defined. It is roughly quadrangular in shape, has a dovetailed attachment to the Sacrum & coccyx and is made up of strong unvascular tissue. Its anterior margin is the posterior vaginal wall which is only loosely connected to the anterior rectal wall until just above the apex of the perineal body. The perineal body is well shown lying between anus & lower part of vagina. Its special usefulness will be considered afterwards.

The Sacral Segment of the pelvic floor is strong in structure, has a strong dovetailed attachment to the Sacrum & is only movable backwards & forwards on the sacrum as a centre.

So far then as our present facts go we see

- I The pelvic floor is compact as a whole
- II It consists of two segments anatomically contrasted
- III Three artificial lines differentiate ^{it} so far as 'mobility' is concerned
 - a one running between the anterior & posterior vaginal walls (Vaginal line)
 - b one between anterior ~~of~~ wall of Rectum & posterior wall of vagina (Rectovaginal line)
 - c one between anterior & posterior walls of rectum (Rectal line)

The special significance of these lines will be seen afterwards. At present I may remark that they differentiate the pelvic floor in three lines of cleavage as it were where displacements alone can occur just as a crystal splits in certain definite directions always.

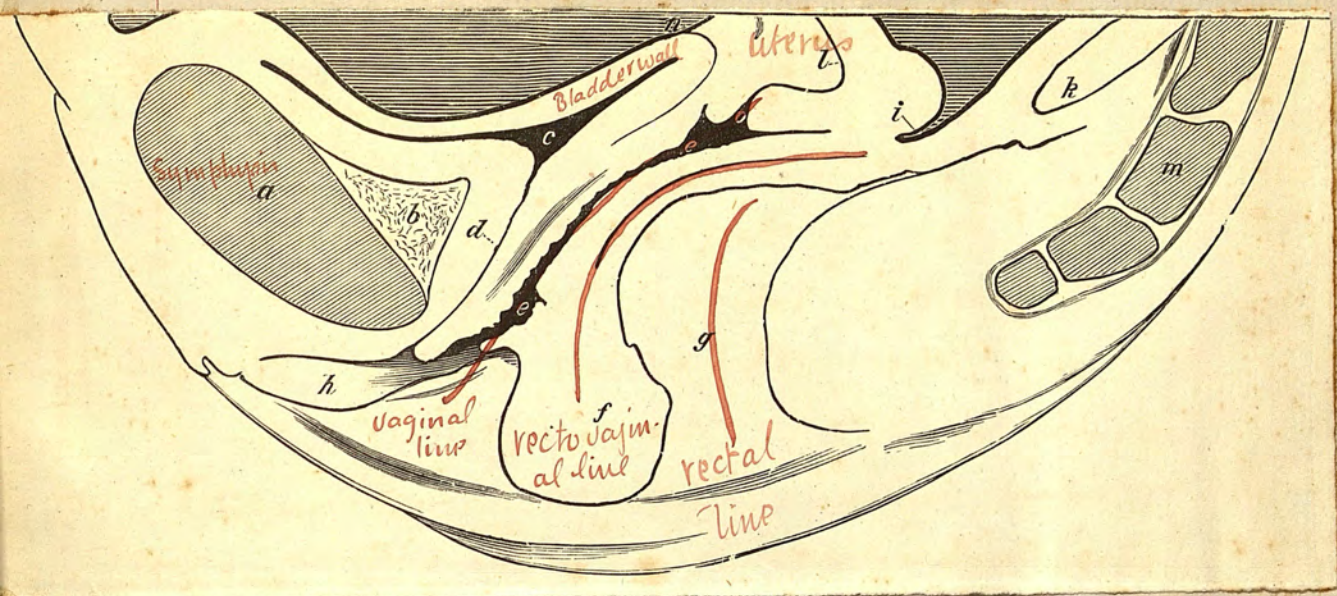
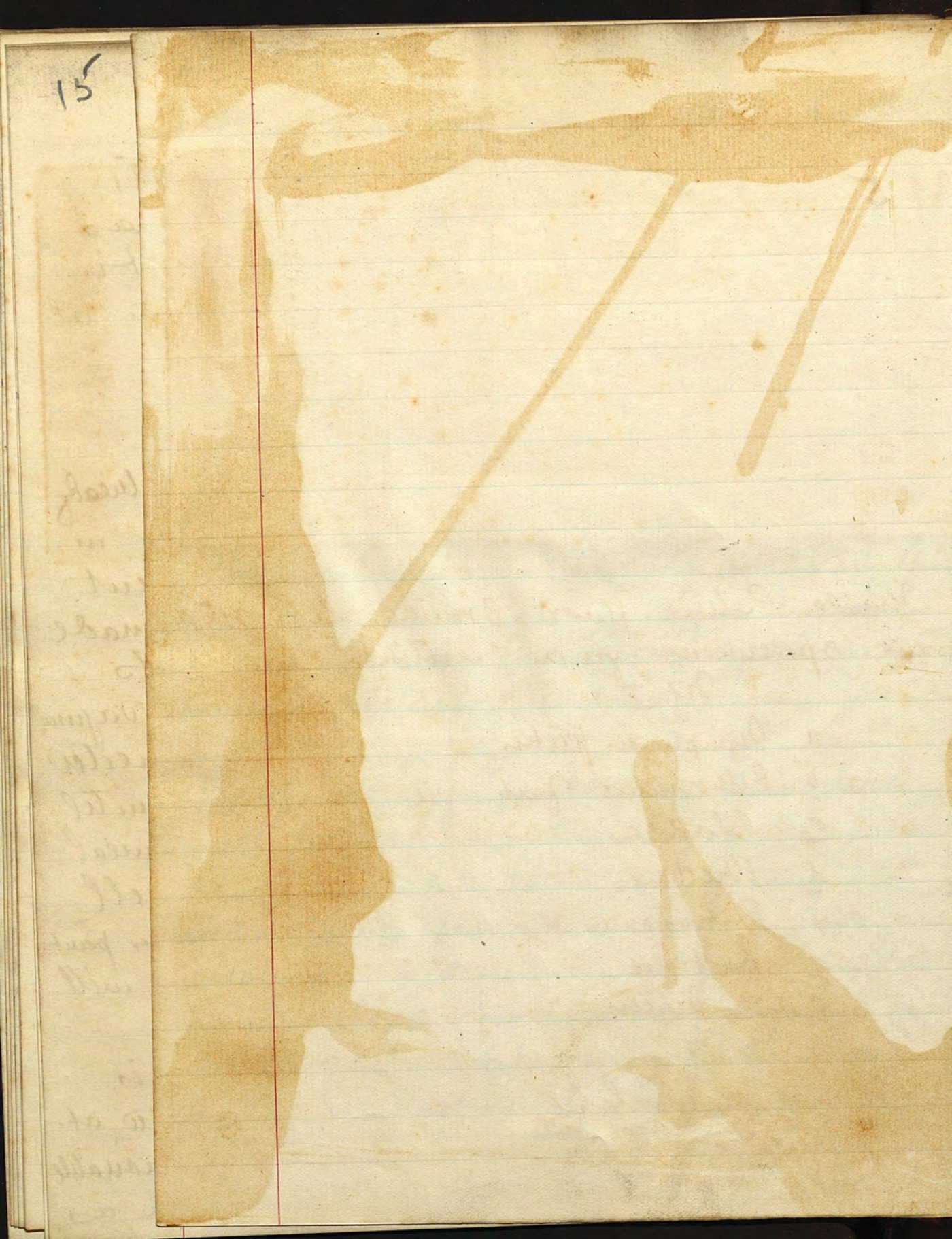


Fig 5. Female Pelvic floor Drawn life size
from specimen given entire in
Hy. I

- a. Symphysis pubis
- b. Retropubic fat.
- c. Bladder
- d. Urethra
- f. Perineum
- g. Rectum
- o. os uteri

Drawn from life? nature

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Figure 5.
 Photograph of Coronal Section of Female
 Pelvis

2 The Female Pelvic Floor in Coronal Mesial Section.

This section shows the pelvic floor in section midway between sacrum & pubis & parallel to the axis of the brim of the pelvis. The special anatomical features are reproduced below the photograph. Structurally it exhibits the pelvic floor as strongly dovetailed into the sides of the bony outlet & sweeping with a marked curve from side to side.

We have thus described the structure of the Female Pelvic Floor as it can be learned from a study of Sagittal & Coronal sections (mesial). If regarded as a whole it can readily be seen that it is a thick fleshy ~~diaphragm~~ ^{diaphragm} ~~conver~~ ^{conver} on its lower side & attached all round by a dovetailed split to the inferior outlet of the pelvis. Running through it from the

from the convex to near the concave aspect of the diaphragm is a 'fault', the vagina, parallel to the direction of the brim of the pelvis. This fault does not extend from side to side of the ~~lesser~~ pelvic floor & while it divides the pelvic floor into two contrasted portions it does ~~not~~ ^{this} incompletely so that the pubic tracheal segments are continuous with one another on the left & right sides of the vagina respectively.

II

The Pelvic Floor opened

up Naturally in

A. Parturition

B. The Semi-pectoral position

A. The Pelvic Floor opened up Naturally
in Parturition

The Pelvic Floor has been already shown to be an unbroken layer in the female while occupying the ordinary upright & prone positions. This may be put in other words by saying that under such conditions the vagina is a slit & unopened, now as Braune's section Tab. V B. bears

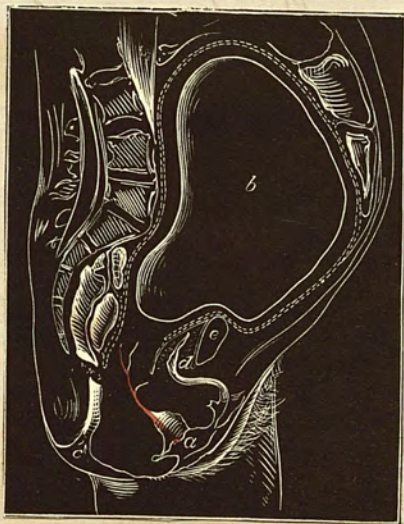


Fig 7. Outline drawing of Pelvic floor & uterus of Woman at end of pregnancy (Braune)
e Symphysis. d bladder a vagina c rectum b uterus
The dotted line is peritoneal

"Die Lage des ^{Uterus +} Fötus am Ende der Schwangerschaft: Leipzig 1872

fully shows this is the case at the end of Pregnancy. (Fig 7)

During labour however the vaginal slit becomes opened up into a canal for the passage of the child's head. As the head advances the pubic segment of the pelvic floor is in front of it, the sacral segment behind it. The question therefore may fairly be asked 'How does the Pubic segment behave?' Is it simply squeezed out of the road by the advancing head? or have we any definite mechanism? This series of questions we shall now endeavour to answer. In Brannan's Tab C' we have a trustworthy section of a woman who died when labour had advanced as far as the completion of the First Stage. The special points to be noted, and as bearing on the changes in the pubic segment of the floor are as follows:—
(v. Fig 8)

"Loc. cit.

234



Fig 8

Fig 8.

Parturient woman in second stage of labour

Pubic segment (coloured red) drawn up

Sacral - (coloured red) drawn down.

Line of os internum in blue line

The side figure shows the pubic segment (coloured red) in the virgin. ^(+ but brain)

Points to be noted on parturient section

1) The anterior uterine wall is much thicker (15 ^{mm} ~~mm~~) than the posterior (9 ^{mm} ~~mm~~) [a, b, Fig 8]

2) The os internum is 60-70 mm above the level of the pelvic brim in front while behind it is almost on a level with

all the measurement ^{have been} ~~was~~ made on Brann's life size sections.

- 3) The bladder is above the Symphysis
 - 4) The peritoneum is stripped off the bladder
 - 5) The pubic segment is a thin hour-glass segment ^{is separated from the sacral segment} with the part of it below the symphysis shortened
 - 6) The sacral segment is being ~~down~~ driven down.
 7. The uterine wall is anaemic.
- Of Brauer's section Tab C. 25. (p. 247) of a woman at the end of pregnancy he considered as to these ~~five~~^{six} points it will be found that

not to
noted
section
end of
pregnancy

- 1) The anterior & posterior uterine walls have the same thickness (8-10 mm)
- 2) The os uterum is below the level of the pelvic brim
- 3) The bladder is below the level of the Symphysis pubis
- 4) The peritoneum covers it as usual.
- 5) The pubic segment is in its normal position & is in contact with the sacral one
- 6) The sacral segment is not driven down
- 7) The venous sinuses in the walls are full.

25
author's
explanation

The explanation of these facts
is as follows

The longitudinal muscular fibres of
the pregnant uterus pass into the
cervix (Luschka). Inspection of Figure
I (photograph) shows that the cervix is
attached by its anterior lip to the
posterior angle of the Pubic segment
of the pelvic floor: by its posterior
lip to the upper part of the sac-
ral segment just below the peritoneal
reflection which constitutes the pouch
of Douglas. When the pregnant
full-time uterus contracts, it pulls
on the cervix & pushes the foetus
down. Anteriorly ^{therefore} it pulls
pulls on the cervix & thus tension
is made of on the pubic & sacral
segments of the floor. The pubic
segment from its anatomical relation
can be pulled up whilst the sacral
one, for a similar reason, cannot

Accordingly the pubic segment is hauled up partly above the brim and thus the ~~cecum~~^{as internum} is higher anteriorly than it is behind. The anterior wall of the uterus is thus more contracted & therefore thicker.

The bladder is lifted up above the symphysis & stripped of its peritoneum. The bladder relation will however be considered in a special section

(p. 77)

It will now be seen then that the compact unbroken layer forming the pelvic floor opens up during labour in a perfectly definite way. Before labour this floor is made up as it were of two ^{broad} folding doors accurately apposed at their broad oblique margins whose contact forms the vaginal slit. During labour the action of the uterus is as follows. It pulls up the pubic segment & drives the child down against the sacral arc. When the child is expelled

the pubic segment swing back and lies on the sacral one. In fact the process is just the same as when one passes through two swinging bank-doors. One half is pulled towards the passenger, the other pushed from him. In this way he makes room for his exit and when past the doors swing into accurate apposition again.

Another
observation
on the mechanism
of
Labour.

We therefore see that in labour the pubic segment is pulled up, the sacral segment driven down, a differentiation of the segments in function as marked as their difference in anatomical structure.

The 'vaginal' ~~vertical~~ vertical line already explained (p. 15) expresses the fact that, quā the soft parts, 'all in front of it is pulled up in labour, all behind it, driven down.

The fact I have now shown has many important practical applications. These I hope to point out further in the course of this work. At present I wish to consider its bearing on normal & abnormal labours.

All obstetricians now admit that remarkable changes go on in the cervix during labour. It is elongated, thinned & dilated & drawn up ~~drawn up~~ ^{admitting the index finger} up. From a canal 3.3-5 c.m. long, it has increased to one 10-12 c.m. long & 10 cm in diameter as measured on Braune's section. Now what ~~is~~ I wish to point out more particularly is that anteriorly the upper limit of the ~~section~~ ^{os internum} is higher than it is behind ^{at the sacrum} by about 6-7 c.m. After labour ^{at the beginning of} it is at the level of the pelvic brim ^{Baudel} or below it according to Baudel ^{Baudel} & Rudinger² after labour according to Rudinger's figure. Now as has been

1. Die Ruptur der Gebärmutter o. 47. Wien 1875
2. Topographisch ^{Chirurgische} Anatomie des Menschen Stuttgart 1873, Tafel VII

more especially pointed out by Bandl, overstretching of the cervix ultimately leads to rupture of the uterus - one of the most serious accidents in midwifery. By suprapubic palpation the junction between ^{thinning} ~~distended~~ cervix + thickened uterine muscle can be felt, ~~as~~ even at the navel in threatened rupture. Previous observations suggest that this ^{abnormal} elongation should be estimated as starting from the symphysis pubis or even below it - but in Braune's section 6 ^(v. 218) which is that in a normal labour we have the os internum already 6-7 cm. above the pelvic brim ^{anteriorly} - a position of it readily explained by the elevation of the pubic segment already described by me. Bandl speaks of the labour in this special section as being an abnormal one. "Doch zeigt er, glaube ich, ein ganz normale, sondern schon etwas abnorme Verhältnisse": and even Braune says 'Der Kopf war gross + das Becken nicht besonders

weir' Measurement of the pelvis shows however that the pelvis is normal. Its alleged narrowness, as brought ^{my} about abnormal uterine effort & a corduly leading to undue ~~elevation~~ ^{elongation} of the os internum does not exist & the elevation is explained at once by the facts already given.

The important conclusion therefore follows

That in normal labour the upper limit of the cervix may be at least 6-7 c.m. above the symphysis pubis. An unduly elongated cervix has therefore elongated from about 6-7 c.m. above the symphysis pubis & not from ^{the level of} its upper edge.

Chiara is a frozen vertical section of a woman who died in labour with a cross-birth figures appearances agreeing with my views.

B. The Pelvic Hair opened up natur-
ally in the semi pectoral position.

B. The Pelvic Floor opened up natur-
ally in the Janupectoral posture.

There is hardly any natural phenomenon in relation to the female pelvic floor more startling & ~~striking~~ than the distention of the vagina with air when certain postures are assumed. This subject has attracted special attention in America where it has been worked at by several well known gynecologists - Marian Sims, H. F. Campbell, A. S. Campbell, P. F. Maudslayi & others whose inquiries have thrown much light on the whole subject although on some points their opinions are definitely not exhaustive enough.

In conducting an enquiry into the matter I began with clinical observation but soon found that the data so obtained could not be satisfactorily explained by any observations I was able to make on the living woman. The views I have already given as to the

construction & varying mobility of the segments of the pelvic floor cleared up much that was formerly obscure to me. It showed me that in the semi-pectoral posture the pelvic segment panned down with the intestine, the sacral segment remained in situ or nearly so & that consequently the vagina became dilated simply because the segments of the pelvic floor were separated. The distention with air was thus analogous to the separation of the segments in labour, gravitation taking the place of uterine muscle. Still I was puzzled to know why this separation of the segments took place: & I was ignorant of course of the exact anatomical changes in the position of the viscera.

For the purpose of clearing up these points I had a female cadaver frozen in the semi-pectoral posture & then sawn in the ^{vertical} mesial line

The section was perfectly successful & I have to submit to the examiners a lithograph of the appearances found.

At present I shall only consider the bearings of this section on the femopectoral position. The lithographic section I shall publish separately with a full detailed commentary by Professor A. R. Simpson & myself and the enquiry will ~~at present~~ ^{be} considered in ~~it~~ my present thesis in its Clinical & Anatomical aspects.

Clinical aspects of the Femopectoral position

For the purpose of observing the clinical facts well, a multipara with lax & abundant genital & abdominal walls, should be chosen. All fastenings about the waist should be undone & the patient only lightly clad. When she lies on her back & the ^{external} genitalia are

ed, so they will be found so arranged that no umbilical membrane is seen. She should be now turned on her knees & made to assume the position figured by Sims & more fully by H. F. Campbell.

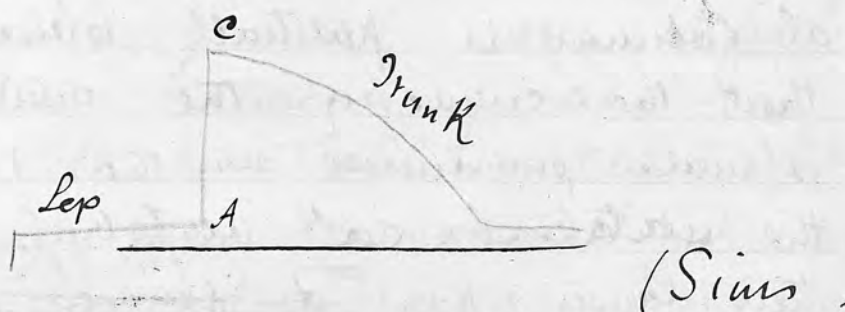


Fig 9.

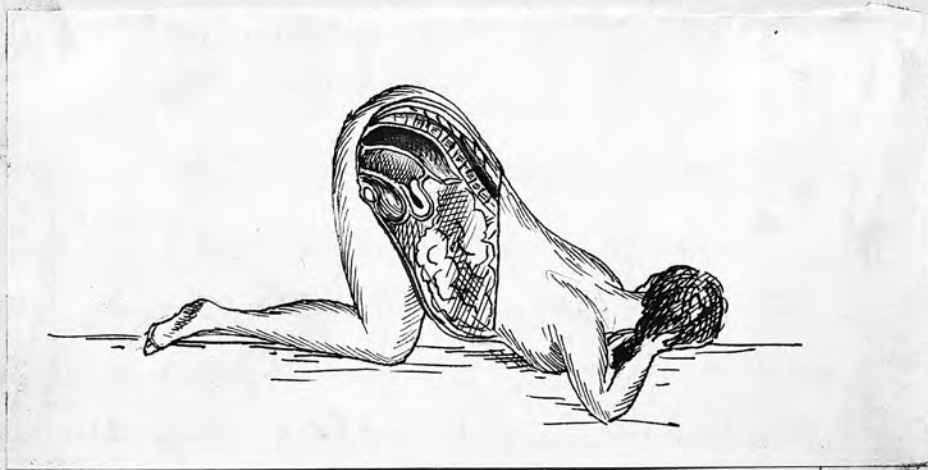


Fig 10

H. F. Campbell

¹ Clinical notes on Uterine Surgery
² Pneumatic self replacement of the gravid uterus
 & non gravid uterus, American Gynecol. & Vol I

The phenomena that now follow are best considered under

- a) alterations in Vaginal Slit &
- b. alteration in position of uterus
- c) consideration of Frozen Cauda.

a) As the result of the change in position it will be found that the ventral column is partially straightened and that the curve of the abdominal wall is more pronounced i.e. the ribs are near the ~~ventral~~ ^{ventral} ventral column at their lower part & further away at the diaphragm: & that the pelvic floor especially at the median raphe is under the thoracic diaphragm. It is still unbroken & the vaginal ^{walls} ~~slit~~ is ~~separated~~ ^{still unbroken} still in contact although the pelvic viscera are under the diaphragm. If now the vaginal orifice be opened up, a distinct hissing will be heard from ^{air} rushing in; & in exceptionally good cases the sacral segment of the pelvic floor will be seen to spring up. The air does not enter

while the labia majora + labia minora
 are separated, nor when the claustrum
 is raised but only after the
 vaginal orifice proper is dilated.
 The finger passed in will then
 find the vaginal slit connected
 with a cavity whose boundaries it
 cannot touch and with difficulty
 and the anterior fornix can be
 felt almost obliterated. It is
evident then that the Semipectoral
position differentiates the pelvic
floor functionally into a vertebr-
al segment - the sacral one - + an
intestinal one - the pubic. The pubic
 segment leaves the sacral one + pass-
 es down with the intestine

the or S.
 cavitation

The explanation of what we have
 now described is as follows.
 When the patient lies on her back
 the segments of the pelvic floor are
 in apposition to the abdominal cavity
 forms a viscous mass attached to

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the bony structure of the pelvis
& vertebral column. On its bound-
aries ^{we} have an equable & constant
pressure (atmospheric). When the
patient assumes the semi pectoral
posture this viscous mass ~~mass~~
~~assumes~~ assumes a pear shaped outline
~~just~~ ^{and} like any viscous material
al ~~to~~ ^{hangs} down from an at-
tachment. The anterior abdomi-
nal curve instead of being a hor-
izantal ~~line~~ surface as it is in
a cadaver in the dorsal position
becomes exaggerated as is well
seen in the lithographed figure.
By the same amount ~~that~~ the
~~anterior~~ that the mass increases
at the diaphragm it does the pe-
floor curve weakens the bony
let altering its ^{own} convexity.
What gravitates down is not
the viscera merely; but the whole
abdominal contents & abdominal
~~viscera~~ ^{walls} behave like one visco-

mass. ^{is greater} ~~is greater~~ ^{apparently greater} ~~than the pelvic floor~~ ^{than the} ~~do with it~~ ^{it is} ~~equal all round~~. The whole viscus mass saps down + changes its outline ultimately taking that form which depends (1) on the strength of its attachments to the bony skeleton, (2) its power of cohesion, (3) the strength of the abdominal wall, (4) the ^{varying} atmospheric pressure. When the vaginal orifice is gently opened air rushing in breaks the cohesion between the vaginal walls. The sacral segment, which was tense, springs back revolv-
ing on the sacrum as a centre. By the dilatation of the vagina with air we get atmospheric pressure directly on the ^{anterior} vaginal wall & on the vaginal aspect of the pubic segment. This segment has a loose attachment to the pubic posteriorly & consequently the whole viscus mass ^{minus the sacral segment} already referred to has a ~~less~~ ^{new} + more yielding attachment

(1) Part of the ~~back of the~~ ^{abdominal} atmospheric pressure on the anterior or abdominal surface is neutralized by the visceral weight

introduced. The viscous mass
 therefore sap down further
 until equilibrium ^{is attained} depending on
 the ^{length of the} bony attachments, & cohesion
 of the mass ~~is attained~~ & other
 conditions already enumerated.
 The atmospheric pressure ~~flattens~~ ^{the pelvic floor} over
 comes the cohesion of the vaginal
 walls ^{& drives down the pelvic segment}. The whole phenomena de-
 pend on gravitation ^{& atmospheric pressure} acting on
 a viscous mass with certain
 bony attachments

It should be specially noted that whether
 in any posture whatever, the abdominal
viscera are always in contact
with the peritoneal surface lin-
 ing: that under no circumstances
 whatever is there ever a vacuum
 or space in the abdominal cavity
 as H. F. Campbell's otherwise admir-
 able diagrams figures. In the
 section given in the lithograph
 it will be seen that the peritoneal

canals is completely filled

2. Changes in the pelvic viscera - Bladder uterus &c

Bladder:- The empty bladder passes above the pubis, & the peritoneum becomes about ~~an~~ 3-5 cm. above the symphysis, instead of being close above it. [Fig I]

Uterus:- The exact alterations in the position of the uterus in the genu-pectoral posture are very difficult to observe. So far as my observations at present go I believe

1. That the uterus if normal in position i.e. somewhat anteverted passes farther from the vaginal orifice 4-6 cm, but moving in a horizontal plane comes nearer the sacrum.

2. That the retroverted uterus if unfixed moves just as in the above case: that if it be enlarged &

The line from its centre of gravity fall in front of the transverse axis of uterine rotation it will rotate so as to lie antverted & it will rotate on its transverse axis. If when the patient is in the Semipectoral ^{position} & the vagina dilated, the line from the centre of gravity falls behind the transverse axis of rotation ~~th~~ the uterus will not replace

3) That if the uterus be retroverted & fixed it will be found more retroverted in the semipectoral position as the cervix alone has gone forwards

4) That the retroverted unfixed uterus will replace itself especially if enlarged, when the cervix is seized with a Valsella & pulled down towards the vaginal orifice & then pushed up towards the sacrum. This manoeuvre ~~essentially~~ ~~for~~ brings the transverse

vertical⁴⁴

axis of rotation behind the line
from the center of gravity

The following clinical case has a
distinct bearing on the subject.

A.B. was seen in Prof. Simpson's
outpatient clinic. Six weeks be-
fore she had a child & had not felt
well since.

Pelvic bimanual examination
showed a retroverted subinvolted
uterus. The Semispectoral posture
gave the ordinary phenomena of
vaginal distention. The uterus
still retroverted had the fundus
pushed down but would not re-
place as it evidently jammed against
the Sacrum. When the cervix how-
ever was seized with a Valsella,
hauled down to the vaginal orifice,
& then shoved up towards the Sacrum,
the uterus replaced its place in
its normal position as was ascertained
by bimanual examination.

Anatomical details as to fem- pectoral cadaver.

For the purpose of clearing up certain points a female cadaver was procured & treated as follows.

It was placed in the fem pectoral position as far as that could be done. The head was not so placed as to lie on one of the cheeks as this would have given an undefined section of the head & neck.

It was then surrounded by a zinc case, airtight, & placed in a mixture of pounded ice & salt for a week. By means of a thermometer the temperature ^{of the mixture} was ~~was~~ ^{continuously} ascertained & ~~the~~ kept at ~~about~~ about 20° below the zero of Fahrenheit. At the end of a week the ice mixture & zinc case were removed & the body, now completely frozen

sawn in the mesial line. #

One of the sections was kept frozen & by means of tracing paper laid on the smooth surface an accurate delineation made of what was present. The section therefore represents accurately the anatomical details & is not drawn to suit any theory.

It will be at once seen that the cadaver does not exhibit the phenomena of a pure vaginal distention with air as ~~the~~ ^{the} rectum is of course unavoidably distended too. While this affects the uterine position & gives, ~~very~~ strictly speaking, the anatomical changes in recto-vaginal distentions, it does not affect the general visceral displacements.

Changes to be noted

I Ventral column :- Its curves are still present but are ^{not so} well marked.

The anterior margins of the intervertebral disks are increased in the

lumbar region. The sacral curve is more pronounced

II The anteroposterior diameter of the ^{subanimal} cavity is ~~at~~ diminished at the sacral promontory ($7\frac{1}{2}$ c.m.) as shown by blue line A: + increased at blue line B drawn ^{3 c.m.} just below the xiphoid cartilage

The ~~the~~ pelvic floor is denser ^{than} the thoracic diaphragm. The blue line C shows ^{what thickness} ~~how much~~ of the pelvic floor lies below it. If any of Brauer's sections of frozen femur be measured similarly they will be found to ~~be~~ have a thickness of tissue below this line at least 2-3 times thicker

III more than half of the space in the pelvic cavity is occupied by an

IV The uterus, when ventral & free to begin with, is of course still

So Gut is nearer the Sacrum.

V The empty bladder is above the symphysis. Its position should be compared with that in the first photograph (p. 7)

VI The retropubic fat triangle is partially ~~the~~ above the pubis & is elongated in shape, not triangular. ~~The~~
^{pubic attachment of the pubic ligament is tense.}

VII The whole abdominal cavity is still tightly packed with its viscera

Other anatomical details I have not as yet worked out.

III

The Pelvic Floor displaced pathologically in

- A. Prolapsus Uteri
- B. Tumours + excudations in Douglas Space
- C. Hauling down of uterus.

A The Pelvis, Haor displaced pathologically in Prolapsus Uteri

In the formation of the pelvis floor a structural problem had to be solved as follows. The floor had to be constructed so that we should have some method by which it could be opened up to admit of the passage of the child's head; & while this was to be arranged in such a way as not unduly to impede parturition, the pelvis floor was not to be impaired in its structural efficiency & was to remain sufficiently firm to resist ordinary & extraordinary uterine pressure.

In the erect posture the vertebral column may be regarded as practically vertical. At the fifth lumbar vertebra this arrangement alters & the first two halves of the Sacrum make an angle about 80° . The remaining sacral & coccygeal vertebral column gradually forwards so that the Sacrum & coccyx

form a surface concave forwards. The further continuation of this bony curve is fleshy, reaches to about $3\frac{1}{2}$ cm from the Symphysis pubis. ~~It~~ forms what I have called the Sacral segment of the pelvic floor & makes an angle of about 60° with the pelvic horizon.

The space between the posterior ~~as-~~ aspect of the Symphysis and the posterior vaginal wall is filled up with the pubic segment of the pelvic floor whose vaginal aspect closely fits on the anterior aspect of the Sacral segment, & is as already described, continuous with the Sacral segment on either side of the vaginal slit. Anatomically considered ~~the~~ ^{and the posterior vaginal wall} the pubic segment are the weak parts of the pelvic floor. So far as displacement of the pelvic floor is concerned then we have to consider the effect of intraabdominal pressure on this part alone.

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The intraabdominal pressure probably acts on the pelvic floor as follows. We must regard the viscera as a much weight of fluid acting at right angles to the peritoneal surface of the empty bladder. A consideration of figure will show that part of

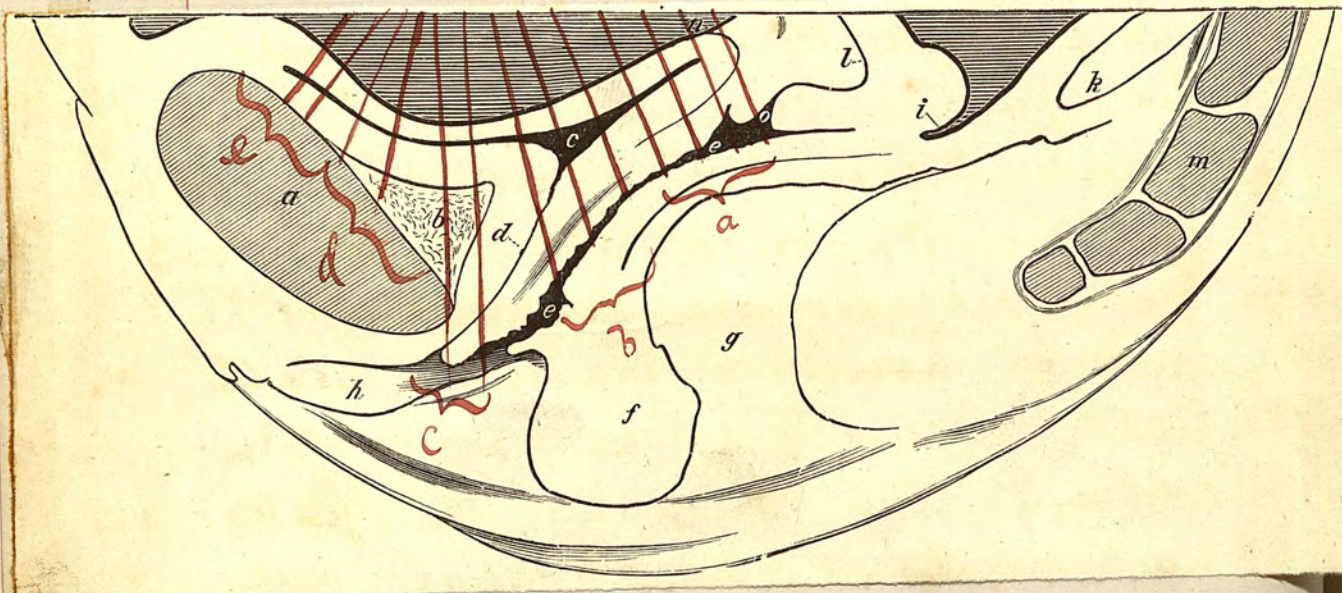


Fig 9. Diagram showing effect of intraabdominal pressure on Pelvic Segment

the intraabdominal pressure will
 press the pubic segment of the pelvic
 floor against the sacral segment (bracket
 a) : another ^(bracket b) part will have a ~~moment~~
 resultant pressing it similarly but
 also a resultant tending to force it
 out at the vaginal orifice : a
 third part (bracket c) will tend to
 force it out at the vaginal orifice
 the parts bracketed d & e will
 have their action like a & b
 but in opposite direction viz
 pressure against symphysis &
 towards ~~posterior~~ vaginal wall or-
 fice. Some of the force will ac-
 cordingly tend to press the pubic seg-
 ment against the sacral one &
 some to force it down & out
 at the vaginal orifice. The want
 of rigidity of the pubic segment &
 its lateral attachments will hind-
 er this forcing out power &
 thus on the ~~act~~ exertion of intra-
 abdominal pressure of an ordinary

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degree the pubic segment will be
forced against the ^{sacral one}
& then the whole pelvic floor ^{looked at from without} will
~~as~~ become more convex when
a woman strains & the pubic
segment will not appreciably slip
past the sacral one.

The female pelvic floor is not how-
ever thoroughly strong. To have made
it too strong & a intraabdominal pres-
sure would have hindered parturition.
The weak part of the pelvic floor
is all in front of the ~~the~~ anterior
rectal wall. Large ^{pressure} contained ^{pressure} will
therefore tend to displace this
portion past the sacral segment &
will displace the pubic segment, the
uterus & the posterior vaginal wall
down. The pubic segment is displaced
down because of its peculiar pubic
attachment, the uterus because
it is attached to the pubic seg-
ment & the posterior vaginal wall

from its attachment to the cervix
 & loose attachment to the anterior
 rectal wall. on this account as well
 as from the intraabdominal pressure
 acting on their upper surface with
 a pushing power we get a definite
 lesion known as Prolapsus Uteri

Hernia through the front half of
the pelvic floor commonly
called Prolapsus Uteri

Hardly any subject has given rise to more
 discrepancy than the pathological condition
 known as Prolapsus uteri. Examination
 of the views advanced by Huguier.

M. Duncan, Goodell, Marion Sims,
 Thomas, Protherus Smith, & many others
 will show how widely their opinions
 differ. By some, lesion of the peri-
 neum is believed to cause no pre-
 disposition to its occurrence: while
 others seem to think that its inter-
 ference is the only safeguard against it.

It is interesting to note that so many acute observers should hold such divergent opinions. Some of the reasons for this are well worth of preliminary attention.

In the first place the stability & structural arrangements of the pelvic floor have been hitherto ignored.

Secondly, the importance of the intra-abdominal pressure has been much underrated.

Thirdly the term Prolapsus uteri is a most unfortunate & misleading one. It has led most gynecologists to accept unhesitatingly the idea that the uterus has something to do with its own prolapse & whereas as I hope to show really plays almost no part in it at all. Had surgeons termed inguinal hernia "Prolapse of the cremasteric fascia," it is evident they would have been ~~slow~~ led as far astray as gynecologists.

Fourthly, it has been chiefly studied clinically.

Prolapsus uteri however must not only be studied clinically but also in anatomic section as it is only by combining what we learn from these & with what we know of the normal structural arrangements in the pelvic floor that we can obtain true views as to its nature

So I shall therefore now consider

a The Clinical features of Prolapsus uteri

b The anatomical features

c The explanation of

1) The definite mechanism

2) The varying position of the uterus during its descent

3. The enlargement of the uterus

d The nature of Prolapsus uteri

e The factors producing it

f Its nomenclature, diagnosis

g differentiation diagnosis

a) The clinical features of Prolapsus Uteri.

If a patient with a complete prolapsus uteri be laid on her side, the whole prolapsed organs be replaced¹, & then (by strain, the following structures will appear & pass out at the vaginal orifice. The anterior vaginal wall first appears at the vaginal orifice from below upwards. Peri parum with its descent the uterus & posterior vaginal wall have come down, the cervix tracing the pelvic curve & the uterus becoming more & more retroverted until when the or extenuum lies at the vaginal entrance the uterus is in the vaginal axis. The posterior vaginal wall has unpeeled from the anterior rectal wall from above down & lies behind the uterus forming a pouch half its own length in depth.

¹ This should be done so that what comes down first is replaced last. The order usually is posterior vaginal wall uterus vault vag. wall.

Further efforts on the part of the woman will now drive the uterus out at the orifice when it will lie with its fundus lower than the cervix. The posterior vaginal wall is now everted completely its lowest part appearing last.

7 The anatomical features in Prolapsus uteri.

These can only be thoroughly studied in a ventral section. Schiitz's figure of which I give a photograph ($\frac{1}{2}$ life size) on the opposite page, illustrates admirably the description I have given. Below the level of the bony pelvic outlet we have from before backwards the pubic segment of the pelvis, the uterus & the posterior vaginal wall &c. just those portions I have shown, an anatomical framework to form the weak or movable part of the pelvic floor. The anterior rectal wall is still in undisturb.

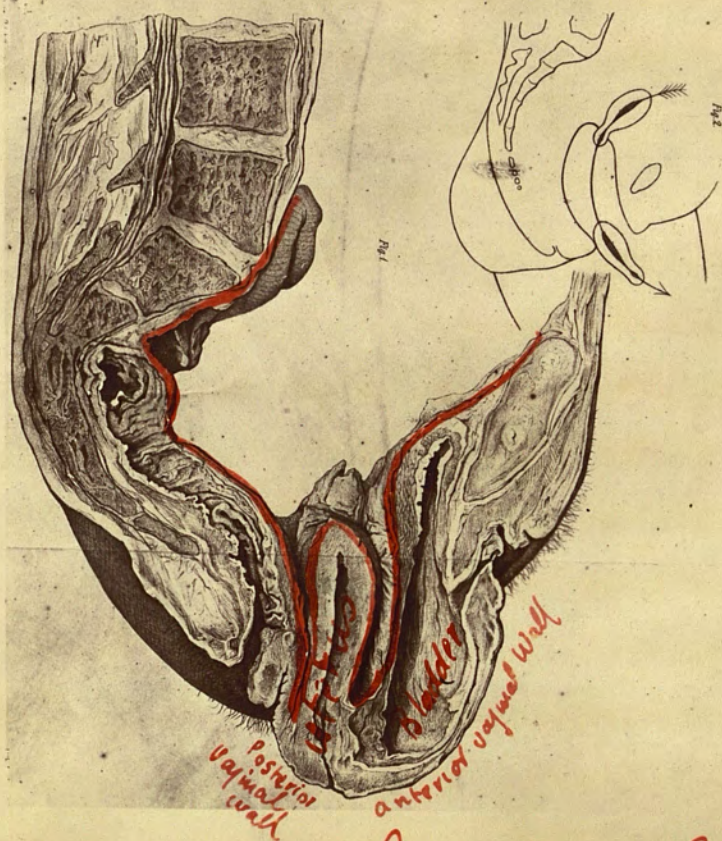


Fig 10. Photograph of Schütz's lithograph of
Prolapsed Rectum.

Red line follows peritoneum.

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ed position. Thus all in front of
the rectovaginal line has come
down - all behind it is in position.
Any protrusion accordingly at the
vaginal orifice which does not feel
as this simple law is not a pro-
lapsus uteri

c. Explanation of

1) The definite mechanism.

It is evident that since all in front
of the rectovaginal line is pushed down
by intraabdominal pressure, it must
have the definite mechanism already de-
scribed when viewed at the vaginal
orifice. To imitate a prolapsus, ac-
cordingly, on the cadaver, the pubic seg-
ment must have pressure applied to
its peritoneal surface. It is erroneous
to suppose that by hauling down the ut-
erine are imitate a prolapsus uteri
This ^{hauling down} will be considered in another
section

2) The varying position of the uterus during its descent

while the uterus is being forced down it has the position of its long axis continually changing, i.e. the fundus becomes gradually tilted back. This is often expressed by saying that the uterus becomes more & more retroverted. This is a loose use of such a term & the real fact of the matter is that as the pubic segment is forced down it is stretched, chiefly ^{on} its pelvic aspect. This segment is attached on the one hand to the symphysis pubis & on the other to the anterior surface of the cervix. While the pubic segment therefore is being pushed down, its tension pulls on the cervix, slings it forward so that the intraabdominal pressure now acting on the anterior surface forces the whole uterus back until it rests on the retrojacent structures. These have the pelvic curve & accord

the uterus constantly alters its axis &c. becomes what is termed erroneously 'pervented'.

3. The enlargement of the uterus:-

It is a fact clinically that in most cases the prolapsed uterus is enlarged. This being alleged to be merely a cervical enlargement (supravaginal) as was first asserted by Huymer. Wunckel requires uteri with this enlargement while Schütz³ found general uterine enlargement in his case.

At present I am only considering Prolapse of uteri in its mechanical aspects, whereas the question of this enlargement is to be settled by post mortem examination. My own belief is that the enlargement is not purely cervical but affects the whole organ: & that it is a consequence of the prolapse, ^{with the os at the vaginal orifice} not a cause. If we view a prolapsed uterus through the pelvic brim it will be seen

Wunckel Die Pathologie der weiblichen Sexualorgane
Huymer: ~~suble~~ quoted in text books
Schütz. Loc. Tafel 8

to lie as it were at the bottom of a valley, the sides of the valley being the broad ligament, the bed of the valley the uterus. The parts of the uterus are not horizontal as the cervix lies lower. It is evident then that the venous return of blood from the uterus will be at a mechanical disadvantage, will consequently suffer from stasis most marked at the cervix. This will ~~be~~ lead to ~~cause~~ ^{connective tissue} hyperplasia & will account so far as my present knowledge goes for the hypertrophy.

of the Nature of Prolapsus Uteri

The uterus has little or nothing to do with its Prolapsus. The term Prolapsus Uteri is a true homonym but misleading one. Prolapsus uteri is really a hernia & is analogous in every point to what we term a surgical hernia e.g. Femoral hernia too and thus in prolapsus

uteri we have

- 1) a sac - the peritoneum
- 2) a definite road along which the intestine travels its boundaries being
 - a. pubic symphysis
 - b. Sacral segment of pelvic floor minus posterior vaginal wall
 - c. Side walls
- 3) Definite coverings viz. from before backwards
 - a. Pubic segment of pelvic floor
 - b. uterus
 - c. Posterior vaginal wall
- 4) Intestine within the sac.
(cf. fig. and appendix)

Prolapsus uteri is therefore a hernia through the front half of the bony outlet of the pelvis, whose coverings get thinned & enlarged

- Q) The Factors producing prolapsus uteri
These are three in number viz.
1. Deficient sacral support
 2. " " tone of pubic segment
 3. Intraabdominal pressure.

1. Deficient sacral support.

By this I mean that as the result of parturition the sacral segment has been made less curved & has got notched at its lower margin. The well known perineal tear. It is wrong to imagine that tear of the perineum is everything in bringing about prolapsus uteri. The perineum may be considerably torn but if the whole sacral segment be sufficiently curved to support the pubic segment & viscera: by intraabdominal pressure be not too great, there will be no prolapsus. Tear of the perineum is not everything in prolapsus uteri but it is as unnecessary to say it has nothing to do with it.

2. Deficient tone in the ^{sacral} ~~pubic~~ ~~tissue~~ ~~segment~~ will evidently have ~~it~~ a bearing on prolapsus uteri as the intraabdominal pressure will more easily squeeze it past the sacral segment.

The time was to cause prolapse & would be to ^{push} ~~of force~~ the pubic segment past the sacral one by means of pressure on its peritoneal surface. In parturition however the pubic segment is hauled up, the sacral one driven down & thus the best way ~~or means~~ of bringing about a prolapsus is not the method by which the uterus opens up the pelvic floor.

Parturition favours prolapsus by weakening the sacral & pubic segment but not by driving down the pubic one.

3) Intraabdominal pressure.

This is the great factor as it alone can cause Prolapsus uteri. It is in this way that ~~virgins~~ ^{virgins} suffer from Prolapsus. Even when the sacral segment is intact & the pubic one has all its elasticity, intraabdominal pressure may ~~do~~ drive the latter past the former &c. Drive the part of the pelvis anatomically used

part the segment anatomically strong.
 It is ^{only} common sense however to ~~say~~
 we to draw the conclusion that the
 task of intraabdominal pressure will
 be easier when factors 1 + 2 exist.

Its Nomenclature, Diagnosis + Differential diagnosis.

The term Prolapsus uteri while ob-
 jectionable is probably the best means
 we have of distinguishing this lesion.
 All such terms as prolapsus vaginal
 cytocele +^c should be avoided as
 they give the idea that it is only
 the vaginal walls or bladder
 that descends: whereas ~~this~~ is never
 the case that the anterior vaginal
 wall is prolapsed itself.
 We may have eversion of the anterior
 vaginal wall or of the posterior
 vaginal wall but these are protrusions
 or distention phenomena + not
 prolapsus in the true sense of the

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Prolapsus uteri with the addition
of the terms 'slight', 'partial',
'complete' or 'thoroughly complete'
is probably the best terminology
to adopt

Diagnosis This is to be ascertained
by noting the relation of parts
externally & using the sound to
give the direction of bladder &
uterus. Rectal examination will
also be found useful as can be
readily understood by reference to
Figure 12

Differential Diagnosis is requisite
~~between~~ ^{from} a protrusion of the cervix
due to its hypertrophic elongation
from prolapsus uteri, ^{inversion of}
uterus & so on. On these ^{elementary} points
& do not need to enlarge. Occasion-
ally but rarely intestine is forced
between the posterior vaginal &
anterior rectal walls. This is

so make that a mere mention of it
is needed.

B The pelvic floor displaced by tumours + exudations in Douglas Space.

Blood extravasations or small ovarian cysts may lodge behind the uterus displacing it considerably to the front. Figure 14 shows this special displacement owing to the presence of a small cyst. Why such displacement should happen is evident. In front of the uterus lies the loose pubic segment; and behind the attachment of the cervix to the anterior rectal wall allows of this ^{forward movement}. The empty bladder is thus above the pubis, but its presence there is due to pressure. The peritoneum is accordingly a little above the symphysis + the pubic fat triangle is flattened + elongated.

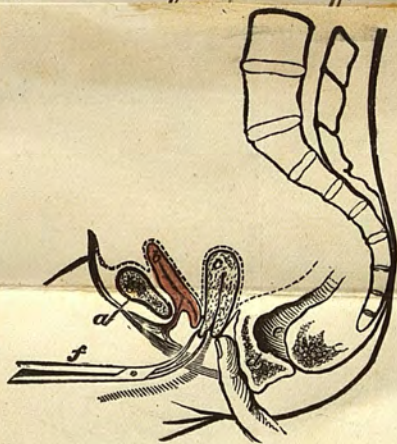
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C. Displacements of the pelvic floor
in hauling down the uterus

The use of specula & other gynecological instruments has given rise to a false impression, and recently shaken off viz that the uterus is an organ which can only be seen or treated at the top of the vaginal slit. The uterus can readily be drawn down by means of a volsella to the ostium vaginal with a force not exceeding 6 pounds. A full account of the practical bearings of this point will be found in a paper by Prof. A.R. Simpson whose figure I reproduce of the displacement so produced & give here.

It explains itself & should be compared with the prolapsed uteri diagram.

Fig. 13. Pelvic segment displaced by hauling down of uterus (A.R. Simpson)



- a Symphysis
- b Bladder
- c Uterus
- d Perineum
- e Rectum



Fig 1B Vertical section of Pelvis.
 Uterus gravid two months & atrophied
 & displaced forward by an ovarian cyst.

Bladder driven by compression above
 pubis.

IV

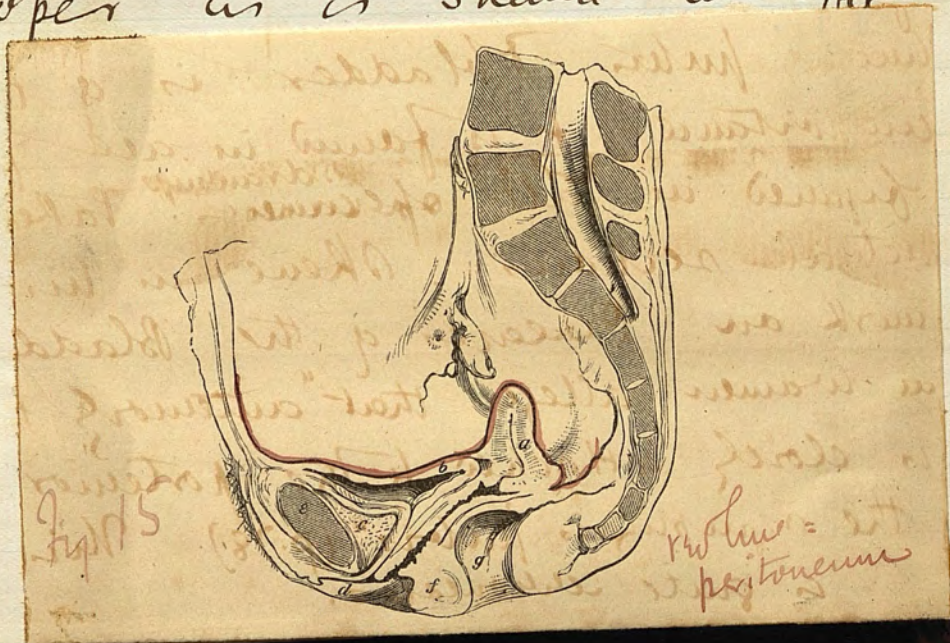
Peritoneum of Pelvic Floor + changes
in position of bladder + retro pubic
loose tissue.

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Peritoneum of Pelvic Floor, changes
in position of bladder & retro pubic
tissue

In this section I purpose giving in detail the relations of the bladder, peritoneum & retro pubic tissue. I have already shown that the pubic segment of the pelvic floor is movable forwards, downwards & upwards. Special points will now be taken up.

The empty female bladder forms in the urethra a Y shaped outline in a sagittal section the leg of the Y forming the urethra & the limbs the bladder proper as is shown in figure 1



It has a pubic peritoneal & vaginal side. Its vaginal side is straight, is closely incorporated with the anterior vaginal wall & anterior surface of the cervix to about its junction with the body proper. The anterior surface of the bladder is not straight but runs back from the top of the symphysis to form an acute angle with the urethra. Thus the greater portion of the posterior surface of the pubis is not in contact with the bladder or urethra, but forms an ~~an~~ & in this way there is a definite pyramidal space here filled with fat. This looseness of connection between pubis & bladder is of the highest importance & is found in all ^{drawings} pelvises & figured in all ~~specimens~~ ^{drawings} taken from actual sections. Osborne in his admirable work on Diseases of the Bladder & Urethra in women alleges that "anteriorly the bladder is closely attached to the posterior face of the symphysis pubis" (p. 78) This however is quite erroneous.

The Peritoneum passes on to the summit of the bladder a little above the level of the top of the Symphysis pubis & is thence reflected on to the top of the Symphysis pubis anterior surface of the cervix uteri. When the bladder is empty there is an appreciable space of the posterior surface of the abdominal wall uncovered by peritoneum. The connection of peritoneum to the abdominal wall is not ~~an intimate one~~ ^{an intimate one}. Finally the empty female bladder has an anteroposterior but practically no lateral diameter.

The bladder relations in the advanced foetus & child in infancy are curious & different from those of the adult. The anterior surface of the bladder in the

Fig. 16



Section of
pelvis of
frozen foetus
Symphysis

foetus lies behind the abdominal wall; the empty bladder even is an abdominal organ & has no anteroposterior but only a vertical diameter. Its relation & diameters are thus quite the reverse of what it ultimately possesses. What the precise changes are which bring about its final state in the adult I do not know. At any rate the adult female bladder when empty becomes a pelvic organ without losing its power of becoming an abdominal one. The loose pelvic attachment permits of its passage up whilst the firm posterior part of the pelvis by resisting its downward distention helps this, so far as distention is concerned by acting as a fixed point.

Hitherto there have been certain anomalous facts in regard to the bladder & its distention *quâ* its position. Thus in certain circumstances the female bladder may seem very much distended so

far as suprapubic inspection & palpation give evidence: but yet when a catheter is passed an unexpected small quantity of urine is drawn off. The female urethra is short, averaging only $1\frac{3}{8}$ " in length: & yet frequently it will not use but a long gum-elastic catheter. Finally surgeons who deal with retention of urine in the male do not meet with such anomalies.

The four following cases give instances of such anomalies & I will give these before entering on the explanation.

Case I. A.B. aet 18 was seen in Professor Simpson's out patient clinic on account of white discharge & pain on making water. Ocular examination of the external parts showed a recent laceration of the hymen & glairy discharge from the ostium vaginal. On vaginal examination the cervix was

found normal in all respects except that the ^{os} looked downwards & forwards. Bimanually, a fluctuating tumour reaching up a little above the level of the pelvic brim was felt in front of the partially retroverted unimpregnated uterus. The catheter introduced 27 oz of urine.

Case II. Mr. C. was admitted to Professor Simpson's ward on account of retention of urine necessitating catheterism. Bimanual examination showed a large tumour in the hollow of the sacrum, marked elevation of the os uteri above the symphysis & a fluctuating tumour in the hypogastric region reaching almost as high as the umbilicus. This physical examination & the history of four months amenorrhoea made the diagnosis of retroversion of the gravid uterus perfectly plain. What concerns us here is the fact that the bladder contained 23 oz of urine a less amount than in the previous case.

Case III In the Centralblatt für Gynäkologie
for June 7th 1879 Litzmann of Kiel
relates a case where the Caesarean section
was had recourse to on account
of threatened rupture of the uterus. In
this communication he makes two valu-
able observations without however
explaining them. He notes that after the
abdominal cavity & uterus were incised
& the child removed, the summit of the
bladder was seen four finger bread-
ths above the pubis. Although there was
urine in the bladder (eine ziemliche
Menge) its position was not due to
constriction as it had been evac-
uated before the operation. But fur-
ther it was noted that the perito-
neum was somewhat separated from
the abdominal wall. Lastly it was
noted on post mortem that the perito-
neum was separated from the ante-
rior wall of the bladder which was
elongated in form —

Kaiserschnitt mit temporärer Ligatur der Cervix
durch den Smarch'schen Schlauch wegen drohender
Ruptur des Uterus bei hochgradiger Beckenenge und ab-
normer Resistenz des Mutterkinds

Case IV Along with Professor Simpson I saw at the Maternity Hospital a patient with rigidity of os uteri supposed to necessitate early application of the long forceps. Suprapubic inspection & palpation revealed a fluctuating tumor bluntly triangular in shape with the apex down. Exact measurement showed that vertically it extended for four inches & transversely for about the same. The catheter passed deeply up drew off only $2\frac{1}{2}$ oz of clear urine. Sometime afterwards the same apparent distention occurred when $3\frac{1}{2}$ oz. urine remained. After the bladder was thus emptied the furrow between cervix & uterus could be felt two finger breadths above the pubis.

Now in the post the bladder was simply distended. It had pushed the intestines up, & tilted the uterus back but the posterior vesical wall was still in its normal position. The pelvis

sum was still ^{on the summit} in normal of the bladder although it passed on to it at a higher level above the symphysis. Thus the bladder though its summit was only at the level of the pelvic brim was considerably distended (Fig.

Fig 17.



Section of woman (frozen) with bladder distended (Pirogoff)

a Vagina
b Symphysis
c bladder
d uterus

Dotted line =
peritoneum

In the second case - that of pelvic version of the gravid uterus - the bladder was certainly even distended. Suprapubic palpation misled as to the amount of distention for the following reason. The ^{ovary} cervix uteri was tilted high up behind the symphysis pubis & consequently the bladder to whose posterior angle the cervix is attached (Fig I) was run up as it were into the abdominal cavity ^{movement} as ~~was~~ permitted by the anatomical arrangements behind the pubis.

The peritoneal relations are as in case I.

Cases III + IV are explained as follows. In the elongation of the cervix we get the pubic triangle ~~is~~ drawn up as explained at par. Consequently the ~~the~~ suprapubic position of the bladder is due to its being drawn up. But owing to the poorer connection between peritoneum & uterus than between bladder, abdominal wall & peritoneum, the peritoneum strips off after the cervix pubic segment has been so far elevated the cervix will yield more than it & thus the peritoneum is drawn completely off the bladder or nearly so.

But it may be urged that distention of the bladder alone may account for its position above the pubis. It does not however as I shall now show.

The bladder may be elevated above

the uterus by distending it with water or by distending the rectum forcibly. In these cases the bladder is pushed up while during labour it is drawn up. The different causation makes a marked anatomical distinction. When the elevation of the bladder is due to a pushing up, the peritoneum is unaltered in its relation to it - as is seen in the plates published by Parapoff, Legendre, Braune & myself. In Braune's Tab C. where the section is that of a woman in labour it can be well seen that the peritoneum is off the bladder. Fitzmann & Rich think that this happens during pregnancy. At the end of pregnancy however the peritoneum still covers the bladder & lower part of the abdominal wall, as can be seen in Braune's section.

Parapoff viii, A 32, fig 20; Legendre Anatomographie Paris 1868 p xvii: Braune plate Tab II B: Garton Ed. Med. 9, Oct 1878

All these peritoneum relations are given in figures below -
 Finally at this point the ^{empty} bladder is above the pubis in the semiprone oral posture & the peritoneum higher above the symphysis (v. Lithograph)

The retropubic fat also alters differently as follows

- | | |
|---------------------------|---|
| 1. Empty bladder. | Behind pubis [Fig 15] |
| 2. Distended bladder | Flattened behind pub. [17] |
| 3. In 1st stage of labour | above pubis [20] |
| 4. In semiprone posture | elongated & partly above pubis. [Lithog.] |

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Figures illustrating peritoneal
bladder relations.

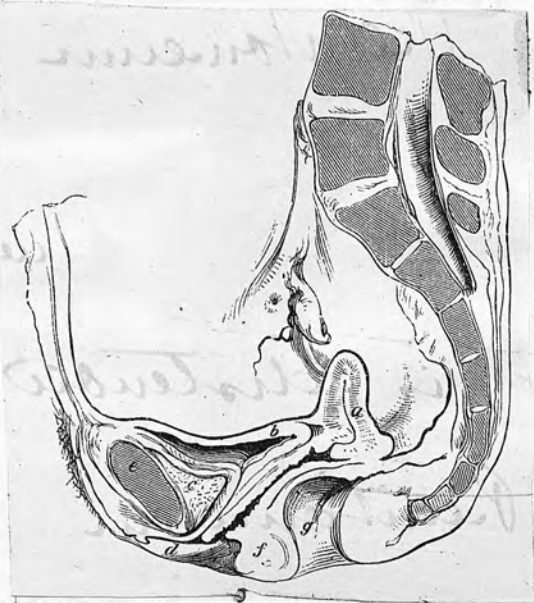


Fig. 18.

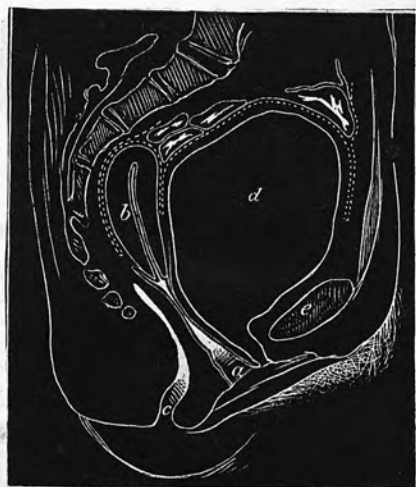


Fig. 19.



Fig. 20.

Fig. 18. Peritoneum normal

- 19. when

bladder is distended

- 20 Peritoneum when

bladder is above symphysis

in 1st stage of labour

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General Conclusions on this Section.

The peritoneum ^{on the Pelvic Floor} is thus as curiously differentiated as the pelvic floor itself 25.

The bladder peritoneum is ^{drawn} ~~normal~~ up in labour + ^{pushed up in} distension of bladder + pans down in prolapsus uteri to form the Sac of this hernia.

The retroperic part is equally remarkable as already explained

Scheme of the arrangement of this Part.

- A. The Pelvic floor has been shown to be compact & unbroken -
- B. Anatomically it can be differentiated into a pubic & sacral segments
- C. The pubic segment is drawn up in labour: the sacral one is drawn down
- D. The pubic one passes down with the intestine in the Semipr. orol posture: the sacral one remains behind & is accordingly vented.
- E. The peritoneum of the pelvic floor also ^{partially} movable i.e. that over the pubic segment is movable, that over the sacral segment is not.

There is the same
of the first.

It is better than the
the same as the first.

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the same as the first.

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the same as the first.

Part II

Practical applications of foregoing
anatomical relations to the arti-
ficial means of opening up &
supporting the pelvic floor -

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Practical applications of foregoing.

A Specula

It is evident that if the female pelvic floor have definite structure it should be examined or opened up in a special way. What holds good for a box, or for a door holds good here.

Gynecologists open up the pelvic floor & explore the vaginal slit by specula + support its anterior segment, or keep the uterus in position by pessaries.

I now wish to consider these instruments & test the theory of their use by the principles laid down in the preceding sections.

And first first- as to Specula.

Three types of specula compete for gynecological favour viz The Sims' or Duckbill, the Ferguson or tubular

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+ the Cusco or bivalve.

In estimating the ~~def~~ value of the different methods of opening up a door the test would be which opened it up in the natural way. The result is the same so far as opening is concerned whether the legitimate Key is used or the door driven in: but only one is right.

Now how can we open up the helix floor naturally. The evident answer is 'By Posture' when the vaginal walls separate as has been already described in the section on the femipectoral posture.

What Speculum then opens up the helix floor in accordance with the natural method? It is easy to see that the Pius is the only one that does so & it accordingly the only good Scientific Speculum we have. Failure in its use & consequent recourse to bivalves or tubular Specula

show that the proper way to use it has not been employed

Method of Employment

Position of Patient:-

The ~~position~~ ^{patient} on whom the Sims speculum is to be passed should be placed on her left side partially attached to the couch with the lower arm over the side of the couch next the gynecologist & in the Semiprone position. The hips should lie close to the edge of the couch & their sacral plane should be oblique r.s. the upper should be in advance. The knees should be well drawn up ^{upward, &}

The speculum is ^{inserted} on its convex surface only.

The index & middle fingers should ~~still~~ open up the orifice & the blade should then be ~~the~~ passed in with the left hand its convex surface looking backward, & its long axis in the vaginal axis. The finger of the right hand should then ascertain

that the cervix is in front of the distal end of the speculum.

Three further manoeuvres are now necessary.

1) The speculum is hauled steadily back at right angles to the posterior vaginal wall.

2) As the posterior vaginal wall is reflected on the cervix, the former manoeuvre hauls the cervix back too. The distal end of the speculum must therefore push the cervix ~~back~~ forward by a rotational movement of the blade on a transverse axis.

3) The proximal end of the blade is then tilted up to keep the upper labium out of the road.

The speculum is now fully passed & so lies that the long axis of the blade passed, lies firm down & forwards.

Nothing has been said about

The anterior vaginal wall because the posture of the patient causes the pubic segment of which it is the vaginal boundary to sag down as has been already explained in the section on the genupectoral posture.

Thus speculum hauls back the sacral segment of the pelvis, gravitation allows the anterior segment to gravitate down. Thus it imitates the natural method of opening up the vagina naturally. All modifications of anterior bars to keep down the anterior vaginal wall are absurd. Sometimes a volsella to steady or haul down the cervix is necessary.

In regard to the Ferguson &usco specula I have only to say that they do not open up the vagina in the natural way. The Ferguson

1010
on 'wires' open the ~~vaginal~~
pelvic floor + is of no use
in operative manipulation.
From the fact that it quotes the
structure of the pelvic floor, pre-
sents the recognition of splits of
the cervix encourages the use of
medication of the so called ulcer-
ations it has retarded the
progress of gynecology.

B

Pessaries.

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Pessaries may be divided into two great classes viz. Those constructed on no principle at all except that of mere stuffing: & those constructed with a knowledge of the structure of the vagina in which they lie & follow all of the direction of the intraabdominal pressure sustained by its walls. The ignorant use of pessaries has brought odium on the profession: but when properly used no class of instruments gives better results.

The really useful vaginal pessaries are those of which the 'ring' or 'Hodge' ~~one~~ is the type. In considering their action it will be best to take the modification known as the 'Hodge-Smith' as the type.

As already described the vagina is a slit with no antero-posterior diameter & with a transverse one varying,

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2.4. broader above than below.
 anything placed in it ~~it~~ is com-
 pressed only in one direction 2.4.
 from anterior wall to posterior ~~it~~;
 & never in a lateral direction un-
 less it so distends the vagina
 as to bring its elasticity into play
 when a patient is erect the back
 wall of the vagina 2.4. the anterior
 boundary of the sacral segment is
 oblique to the horizon as Figure
~~2.4~~ 21 shows



Horizontal
line

A Hodge-Smith pessary has a symain curve to suit the shape of the posterior vaginal wall & is broader above than below

The length of such an instrument should be less than the length of the posterior vaginal wall, & it should be broader above than below & its greatest transverse breadth should be such that it can pass the vaginal orifice easily. It is wrong to make the pessary extend from side of side of the vagina: not only wrong but dangerous

The Hodge-Smith pessary is therefore 'an outline mould of the vaginal slit - but on smaller scale transversely & longitudinally'

The question to be answered now is

1) How does such a pessary remain in the vagina

2) How does it act on a retroverted uterus

1. How does it remain in the vagina:

Draw the obliquity of the ~~uterine~~ posterior vaginal wall it rests firmly there: but the pubic segment of the pelvic floor which presses on the sacral segment naturally presses it back as it intraabdominal ^{right angle} pressure presses the pubic

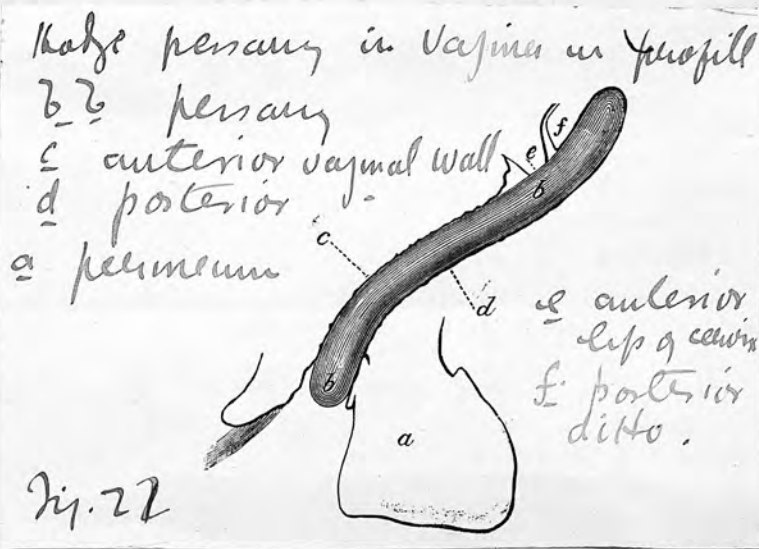
2. segment against the sacral one & the passage lying between is kept in situ

2. How does it act as a retracted uterus:

The cervix uteri has the anterior & posterior vaginal walls reflected on it. If the finger be pushed into the anterior fornix so as to tighten it, the cervix is drawn to the front & the fundus naturally tilted to the back. On the other hand, if the posterior fornix be made tense by being pushed up, the uterus will be anteflexed more or less in proportion to the force in the fornix & the weight of the fundus.

Pressure in the posterior fornix when the uterus is $\neq$ retroflexed will rotate the uterus towards the front not because the fundus is pushed - an direct, but because the cervix is pulled back + the uterus acting as a rigid body, the fundus tilts forward.

Figure 22 shows a propell view



of a Kody-Mith Pessary in situ. The posterior vaginal wall runs round the upper like a pulley, draws the cervix back + tilts the fundus forward. The full explanation there fore is

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as follows
The Hodge-Smith pessary when introduced then is kept in position by the obliquity of its support v.s. the sacral segment and the right angle pressure of the intraabdominal viscera above it v.s. from diaphragm to vaginal aspect of pubic segment. The ~~for~~ upper bar lies in the posterior fornix, keeps it at its normal tension, tilts the cervix back to the fundus forward.

The lever theory of the Hodge is advocated by eminent gynecologists & I am convinced that it is entirely erroneous. If a vertical section of a female with a pessary in situ be made it is evident we have a fluid pressure on the posterior vaginal wall & therefore are the pessary separable at right angles to it. It is a piece of mere assumption that the pressure is greater on the lower part of the

pleating. The whole pennis is
 pushed downwards ~~to~~ ~~forward~~ backwards
 the lower bar probably more than
 the upper the point of rotation be-
 ing the upper bar itself. The pen-
 nis moves as the sacral segment
 does.

109

The whole passage is

marked throughout to show the kind of

the same for the whole of the

The upper part of the passage is

the same for the whole of the

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Value of the Semi Pectoral
Posture in Treatment of
Diseases of
Women

111

Value of the Semi Pectoral Posture in the Treatment of the Diseases of Women.

That the Semipectoral posture & its consequent dilatation of vagina or rectum with air is valuable in the treatment of Diseases of women is undoubted. at the same time it is limited & belongs to the replacement of the backwards displacement of the grain or non grain uterus.

H. F. Campbell recommends it to be employed in gynecological manipulation.

This I consider to be a mistake.

Thus it is an awkward position for the patient: & as it alters the capacity & shape of the vagina, instruments such as the Hodge should not be inserted while the patient is so placed.

For the ^{Rectification of the} backwards displacements of

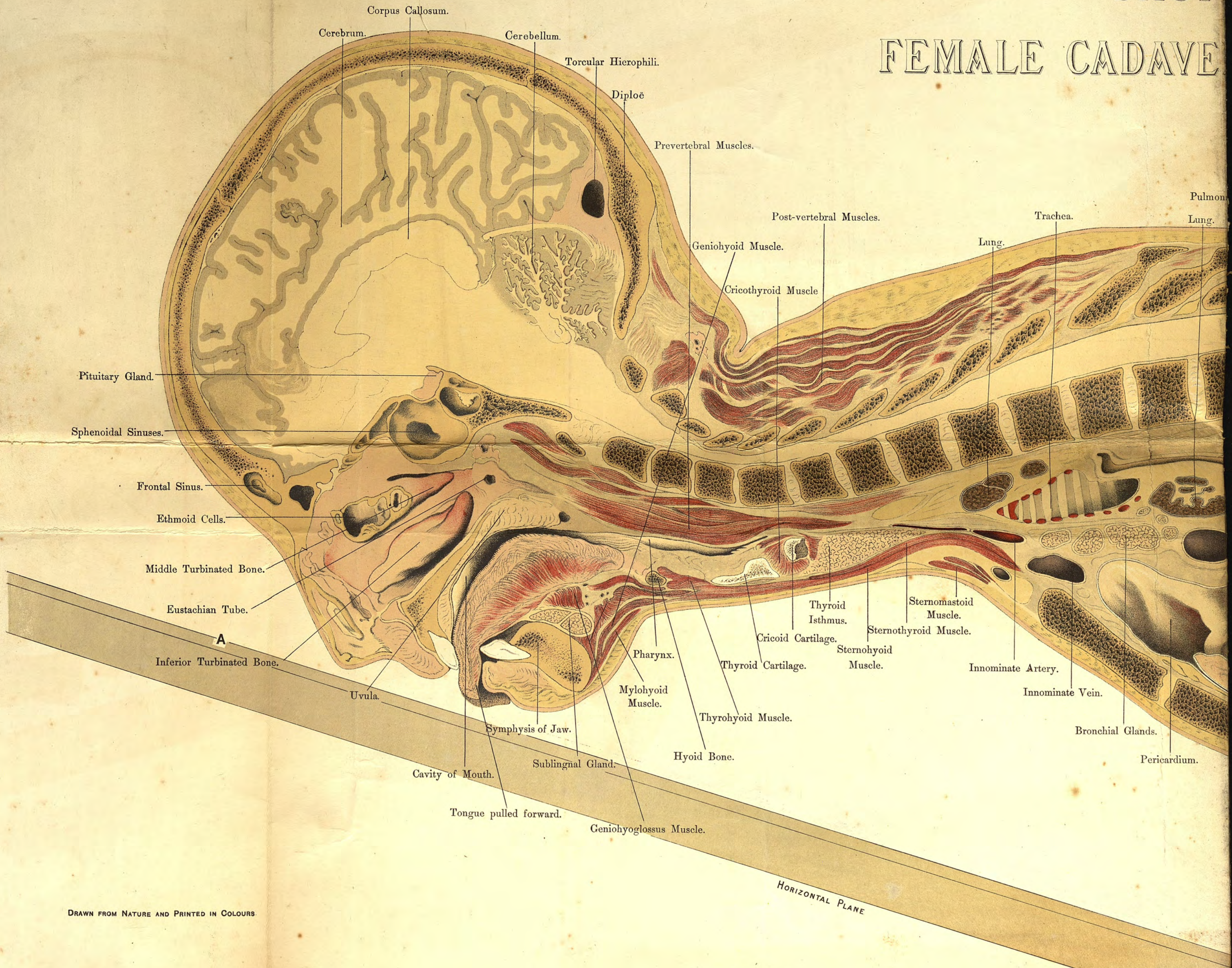
the uterus the more glumpeckor-
al posture is not sufficient: &
facts that I am at present ac-
cumulating are showing me that
rectovaginal distention with air & sub-
sequent manipulation will prove the
best method.

Appendix.

I have been prevented by a
press of work from working out
in detail the exact analogy that
exists between say an inguinal
hernia & prolapse uterus.

I am convinced that posture &
rectal distention will prove a
good means of reducing hernial
evidence & in support of this
can be gathered from the litho-
graph I have given of the
semi pectoral posture.

FEMALE CADAVE



TAL MESIAL SECTION OF R FROZEN IN GENU-PECTORAL POSITION.

