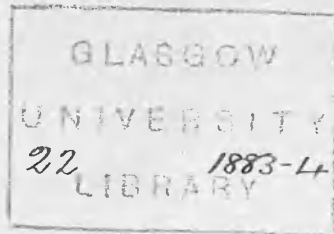


Passed July 1883



*A case of  
Enlarged Prostate  
with  
Sacculation of the Bladder  
and  
Hidden Calculus.*

---

*John. M. Yair.  
Kilcreggan.*

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I have chosen this case as the subject of the following thesis for the following reasons,

- (a) The features of interest which it presents,
- (b) The opportunity which I had of observing the patient for a period of twenty one months.
- (c) The opportunity which I had of making a partial post-mortem examination.

I shall first give a pretty full account of the case, then an account of the post-mortem examination, referring in this connection to

to the light it threw upon the hitherto somewhat obscure symptoms, and lastly add a few general remarks.

### Account of the Case.

A. B. came under my care on the 31<sup>st</sup> March 1881. He was about 70 years of age, and previous to his retiring from active life had been engaged as a Commercial Traveller.

His previous history so far as I have been able to learn was as follows

In January 1844, he was under the care of Professor Buchanan, Glasgow. (who has kindly allowed me his journal notes of the case) and at that time underwent several operations of

of lithotomy, his bladder in the intervals being regularly washed out.

To all appearances the operation was successful, but as some symptoms reappeared, Professor Buchanan examined him on several occasions subsequently. Once or twice he thought he felt the sound "grating against something rough", but on the other occasions he could find nothing indicative of any remnant of stone being in the bladder.

By Professor Buchanan's advice he consulted Sir Henry Thomson who, after (I have no doubt) a very thorough and careful examination, gave his opinion that there was no stone in the bladder.

In October 1874, Professor  
Buchanan

Buchanan again examined him, and remarked that if a stone existed, it was beyond the reach of instruments. He also said, as the patient informed me, that the bladder was of an unusual shape, that there was a second bladder, and that only sometimes the sound reached the second bladder.

The treatment in the interval was, the washing out of the bladder, and regularly passing the catheter, as directed by his medical adviser.

From March 1881, I attended him regularly till his death.

The urine was alkaline, ammoniacal, contained mucus in considerable quantity, also pus, and sometimes blood. Phosphates were occasionally passed

passed in considerable quantity

He had the usual symptoms of cystitis, and of enlarged prostate.

The treatment was as follows - washing out the bladder once in the 24 hours with a saturated solution of boracic acid, and passing the catheter at bedtime.

There were some peculiarities in regard to catheterism which call for remark - There never was any great difficulty in introducing the instrument.

On its reaching the bladder, a strong stream of urine came away - After this had been exhausted, on pushing the catheter a little further another stream followed, which again stopped very suddenly. Sometimes I felt the

the sensation, when applying the catheter, of a body coming against the end of the instrument. This sensation was different from that communicated by the coming together of the walls of a sac which was often felt. On one occasion, when the feeling of a body coming in contact with the instrument was very marked, I remember observing "I believe that's a stone." At other times the urine came away in a small dribble. The mucus, pus, blood, and phosphates generally came at the end of the streams referred to. I never was satisfied that the bladder was thoroughly emptied.

Matters continued in this

7

this condition till January 1882. On the 21<sup>st</sup> of that month, the patient was seized with the most violent spasms (with frequent micturition or attempts at micturition) that I ever witnessed. The pain was somewhat controlled by subcutaneous injections of morphia, but the spasms continued at intervals of four or five minutes day and night. He complained of constant pain in the left side. The pain resembled that observed in the passing of a renal calculus through the ureter. On the 23<sup>d</sup> January the pain moderated, and simultaneously with this moderation of pain, he passed a considerable quantity of blood among the urine, and

and much more than he had passed on previous occasions. The passing of blood continued for a week or so, when it gradually ceased, and he returned to much the same condition as he had been in previously. The mucus, pus, blood and phosphates had by this time considerably increased in quantity.

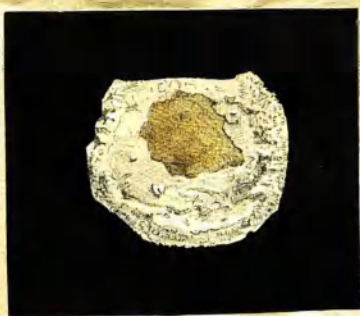
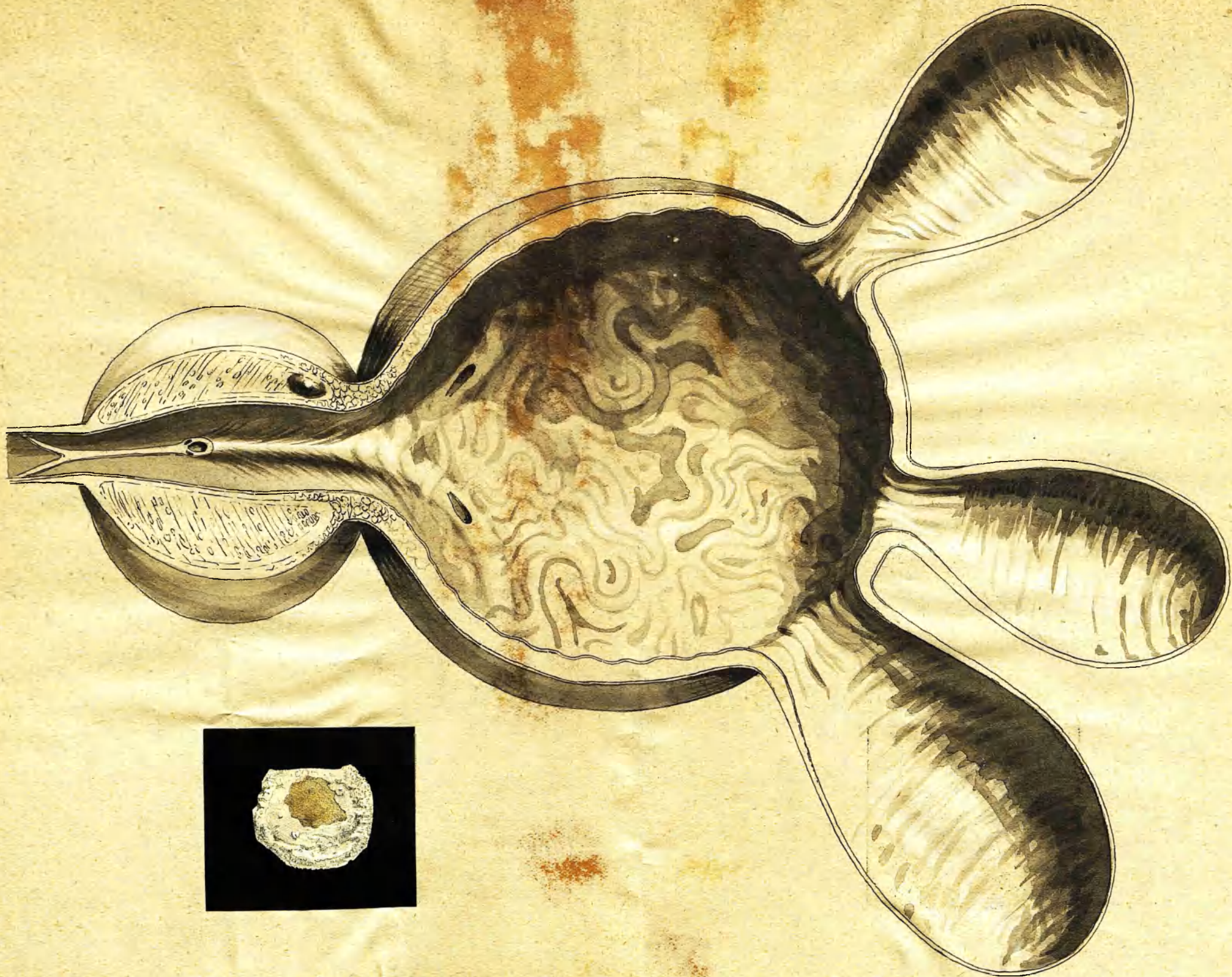
During the acute symptoms mentioned above, I called a well known Greenock Surgeon in consultation, and we agreed to continue palliative treatment, and not to explore the bladder with the metallic sound. This course was decided upon, from a consideration of the patient's state at the time, and a knowledge of the previous history of the case, the surgeon, who attended him

him previous to his coming under my care, having informed me that on his once attempting to use the sound, the patient was seized with violent rigors, which caused him to desist.

The washing out was now performed twice (sometimes thrice) daily, owing to the increase of muco-purulent matter (which frequently blocked the catheter)

In October 1882. I found a small phosphatic calculus impacted in the eye of the catheter, and which was about the size of a lead-drop.

About the 18<sup>th</sup> of December 1882 patient began to get drowsy though he could easily be roused - On the 23<sup>d</sup> at my evening visit, he was semi-comatose. He had had a convulsion about half an hour before



before I arrived. After a purge he was somewhat better on the forenoon of the 24<sup>th</sup>. In the evening he had a convulsion, and during the night he had three or four. On the 25<sup>th</sup> he was quite comatose, and died in the course of the day.

### Autopsy

The accompanying diagram, (drawn according to directions by a friend) gives a pretty accurate representation of the condition of parts. The communications between the sacculi and the bladder, seem, however a little too large.

The Prostate Gland was about the size of an orange. The hypertrophy was pretty uniform, but a little more developed on the left lobe, consequently

11

consequently the urethra was a little to the right of the middle line. On the right side of the prostatic urethra, at the junction between the bladder and urethra, there was a small swelling about the size of an almond which was apparently cystic. On its being cut into, a jelly like material escaped.

Bladder. Just behind the prostate gland, I found the calculus represented in the diagram, the circumference of which was about that of a halfpenny, and the thickness about four lines. The central part was of uric acid, and round it was a pretty thick incrustation of phosphatic deposit.

The bladder proper was much contracted, and the inferior wall

wall was very much hypertrophied being about three quarters of an inch in thickness.

The superior wall was not nearly so thick. The mucous membrane was columnar. From the posterior part of the bladder there protruded three large sacs, each capable of containing an ounce or two of fluid. They communicated with the bladder by foramina which in the case of the right and centre one would admit the passage of a No 15 or 16 Catheter. That on the left, it is worthy of notice, had a much larger canal than the other two, and was quite large enough to allow the passage of the stone above referred to out of this sac into the bladder. The sacculi were all

all full of mucous-jerulent-matter.

The Ureters were considerably dilated, and entered into the bladder proper not into the sac.

The Right Kidney which was the only one examined, did not show anything abnormal to the naked eye.

Microscopically examined, it was seen that the Malpighian bodies were irregular in form and size. Some of them were distinctly granular, while others had a homogeneous appearance. A number of them had become completely destroyed and their position was only indicated by a small round mass of connective tissue.

The convoluted tubules were distended, the epithelium having become broken up, so that the individual cells were indistinct.

In

In some parts, it was very difficult to trace the epithelial elements at all, or to distinguish them from the cells forming the intertubular tissue. The tubules in the medullary portion were filled with epithelial casts. The muscular walls of the vessels were considerably hypertrophied.

The peculiarities referred to when the patient's urine was being drawn off, can I think now be very easily explained by the results of the post-mortem examination.

The catheter first entered the bladder proper, and drained that, but the sac would still contain some urine, and on the further introduction of the catheter it

it penetrated one of the sacs which in its turn was emptied so causing the second stream of urine. Again the catheter on being partially withdrawn, and after a little manipulation, another stream followed which I attributed to the instrument entering another sac.

The sensation of a body coming suddenly against the end of the catheter was, I believe, caused by the stone referred to coming in contact with the catheter as the urine was being drained away. This sensation was only sometimes felt distinctly, but on almost every occasion of catheterism you had the sudden stoppage of urine with the feeling

feeling which Guthrie has called "the fluttering blow of the bladder" and which is generally attributed to the walls of the sac coming together. (See H. Thomson. Disease of Prostate page. 173)

It has been observed that the passage into the left sac was much larger than that into the other two, and it was quite large enough to admit the passage of the stone found in the bladder. I think the probability is that a fragment of the stone after the operation of lithotomy had escaped into this sac, and had there become encrusted with phosphatic deposit, and that thus arose the doubt about the existence of a stone. The sound would only occasionally pass into the

the

the sac. and then only would the surgeon have the feeling of the sound "grating against something rough". The patient always complained of pain in the left side, especially during the acute symptoms in January 1882. The whole symptoms at that time corresponded with those of the passage of a stone, and the large quantity of blood passed in the urine seems to me to entirely substantiate this explanation; as the rough phosphatic surface of the calculus, would inevitably cause considerable injury to the walls of the canal in its passage.

The pathology of such a state of the bladder seems to be generally agreed on

on by Surgeons (See Holmes System of Surgery. 2<sup>nd</sup> Ed<sup>n</sup> Vol IV page 897. Bryant's Surgery. 2<sup>nd</sup> Ed<sup>n</sup> Vol II page 57. Coulson's Diseases of the Bladder. 5<sup>th</sup> Ed<sup>n</sup> page 192)

The causes in this case are manifest, viz, the enlarged prostate, and the irritation of a calculus. These had set up cystitis with retention of urine. Therefore it was quite to be expected that hypertrophy of the muscular fibres should be brought about by the increased muscular effort to empty the bladder, that the bladder should become columnar from the enlargement of the muscular fasciculi, and that sacculation should be brought about by the occurrence of herniae of the bladder, caused by hydrostatic pressure forcing out the mucous membrane between

between the hypertrophied fibres.  
 There are several such cases on record. Sir Henry Thomson (Diseases of Prostate page 73) relates a case in which there was one large sac which contained three or four ounces of urine. The cause in this case was a spheroidal tumour of the prostate causing almost total obstruction to the flow of urine.

Braut (Practice of Surgery 2<sup>nd</sup> Ed. Vol II page 58) records a case in which a sac was double the size of the bladder itself. Coulson (Diseases of Bladder pages 192, 193) records a case in which the pathological appearance of the bladder resembled the one reported above, there being three sacs. The cause had

had been stricture of the urethra, but the same factor, viz: obstruction to the flow of urine, had come into play

The occurrence of calculi in sacculi of the bladder is evidently not uncommon. Fleming (Injuries & Diseases of the Genito Urinary Organs. page 248) mentions a case in which he found "some irregular lithic calculi in the sac" and Bryant (Practice of Surgery Vol II page 58) recognizes the possibility of such a thing.

Platner (Coulson's Diseases of Bladder page 195) saw a bladder, which had thirty nine sacs, and each contained a calculus, and I observe that Sir Henry Thomson mentions that such an accident, as I believe actually happened in this case, may occur. He says

says. (Diseases of Urinary Organs page 91)

" These phenomena (the phenomena of clouded, alkaline urine, depositing triple phosphates, and the local symptoms of cystitis occurring after an apparently successful lithotomy) may sometimes be due to the escape of a small fragment into a sacculus of the bladder, where it becomes the source of irritation, phosphatic deposit and occasions the formation of a fresh vesical calculus.

That the calculus may subsequently be forced by the contractions of a sac, full of fluid, through the communicating canal into the bladder, does not seem to me improbable, provided that the said canal is wide enough to admit the passage of

of the stone, which was certainly the case here.

The formation of a uric acid calculus is, according to authorities on the subject, of renal origin, and among the various causes which are supposed to give rise to this condition is a greater supply of nitrogen than is required for the repair of the tissues, as in high living, especially the over-indulgence in animal food. This seems to me from my knowledge of the patient to be the most probable cause in this case. To use his own words he lived "like a fighting cock". Other causes need not be mentioned as I do not think

from

from the history, that they have any bearing on the case - The phosphatic encrustation naturally follows when a stone has been lying for a lengthened period in the bladder where there is chronic cystitis and alkaline urine. The result is the "mixed calculus" represented in the diagram.

Many have been the theories regarding the etiology of Hypertrophy of the Prostate. In earlier times, it has been confused with inflammation. The latter although it may produce enlargement by a deposit, does not cause a hyperplasia of the existing tissues. Among the many supposed causes

causes may be mentioned  
the following -

All the diatheses. Scrofula,  
Gout, Syphilis. Rheumatism etc.  
There is no proof whatever  
that it occurs more commonly  
in persons who are the subjects  
of any of the above morbid  
tendencies

Habitual engorgement of the  
prostatic veins due to any obstruction  
to the return of blood from the pelvis.  
It is difficult to see how a  
mere passive congestion accompanied  
by exudation would cause a  
new formation of tissues. If  
such were the case how  
often would we see an  
increased development of the  
integument in cases of  
varicose veins of the  
leg? Thickening of course  
we may see, but this is

is due to an interstitial deposit, (Holmes System Vol III page 382. Bryant Vol I page 479) not to any true hypertrophy of the tissues.

Structure of Utricle. One point of fact according to Cruvelhier structure and prostatic hypertrophy rarely coincide. Undue development of the muscular tissue at the neck of the bladder due to any irritability of that organ, causing a "barrier" is sometimes found accompanying stricture, but such a condition is not real hypertrophy of the prostate. (Sir H. Thomson on Diseases of the Prostate page 60.)

Calculus in the Bladder.

Irritation of the bladder occurs here also, and may produce the "barrier" referred to above. If real hypertrophy was caused we would see it frequently manifested

manifested in children who suffer from calculus, but this is not the case.

Gonorrhoea - No proof whatever is adduced whatever in support of the assumption that this disease bears any relation to enlarged prostate

Looking at true hypertrophy in other parts of the body, the cause is generally an uncontroled exercise of function producing an increase of nutrition. In prostatic hypertrophy, anatomical examination shows that the arteries and veins are enlarged (Sir H. Thomson Diseases of the Prostate page 63) indicating that increased nutrition has here also come into play

The prostate is a partly muscular organ, and partly

partly glandular, but the muscular tissue in the normal prostate predominates largely over the glandular.

The function of the prostate judging from its structure must therefore be twofold.

As a gland it secretes the prostatic fluid which is commonly believed to dilute the semen.

(See Carpenter's Principles of Human Physiology, 4th Edition page 822)

As a muscular organ its function is to assist in expelling the seminal fluid (See H. Thomson's Diseases of the Prostate page 61. and reference there to Professor Ellis paper in the Medico-Chir. Trans. Vol 39. page 332.)

Carpenter states that, in animals which have only a periodical aptitude for procreation, it undergoes an alternate increase and decrease, corresponding with the periodical enlargement

and diminution of the testes themselves.

There seems little reason for doubting that the prostate is intimately connected with the function of generation and the generative act.

Sexual Intercourse, too frequently repeated, appears the most likely way of producing an over-nutrition of this organ and consequent hypertrophy because it causes its function to be unduly exercised.

The following arguments have been advanced against this theory.

That it occurs as frequently in men who have lived a life of celibacy, as in those who have led a life of excess. (See Wilson's lectures on the Structure and Physiology of the Male Genito Urinary Organs pp 331, 332)

also

also that it frequently occurs  
" in those who have lived  
a moderate and quiet  
life, approaching to neither  
extreme. "

Now it seems to me  
that it is almost impossible  
to answer for any man's  
mode of life, and such  
statements are apparently  
mere surmises. Even  
supposing that a man  
has not sexual intercourse  
too frequently, might not  
the same result, as far  
as the prostate is concerned,  
be brought about by  
too frequent nocturnal  
pollutions, or even by  
masturbation?

Another objection is  
that hypertrophy does not  
exist when the function  
is

is in the greatest vigour,  
 which is what would  
 naturally be expected. This  
 is a strong objection but  
 a brief consideration of  
 one or two views will  
 I think tend to mitigate  
 the strength of it.

Hypertrophied prostate is  
 seldom found out until  
 it begins to cause annoying  
 symptoms, such as too  
 frequent micturition, retention  
 of urine &c. May the  
 change in the gland not  
 have been going on for  
 a considerable period, probably  
 years before discovery?

Although it certainly appears  
 comparatively late in life,  
 can this not be accounted  
 for to some extent by  
 the peculiar nature of  
 the

the function, and the  
 recuperative power being greater  
 in youth and early manhood,  
 than in the period when  
 the individual is approaching  
 old age? In hypertrophy  
 of the heart due to  
 obstruction of the cardiac  
 valves, the exciting cause  
 is ever present and the  
 cardiac muscles enjoy no  
 repose at all. But there  
 are intervals of greater  
 or longer duration between  
 the performances of the  
 sexual act, which allow  
 the organ to recover itself,  
 and which recovery may  
 be almost complete in  
 youth and early manhood.  
 When the vital powers,  
 however, are beginning to  
 fail is it not to be

be expected that the mischief will be more prone to develop itself?

The hypertrophy in this case was I believe principally in the stromal portion of the organ. This is the most common form of hypertrophy, and it is said, the only one where the prostate weighs more than two ounces. Where tumours exist of course they may come up to or exceed this weight, but with the exception of the small cyst referred to, and which I take to have been caused by the dilatation of a gland follicle, there was no appearance of any tumours

tumour in the organ, so far as could be seen by the naked eye.

In conclusion it may have been that if lithotomy had been performed after January 1882. when the stone was accessible, life might have been prolonged for a little, or perhaps, and what is quite as likely, death would have been accelerated, but as it was, considering the extent to which disease had progressed, it was surprising how long he lingered, and that in apparently comparative comfort. I am inclined to account for.

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for this prolongation of  
 life to the constant  
 attention to the washings  
 out of the bladder,  
 with the solution already  
 referred to, to the  
 regulation of the bowels  
 and of his diet, and  
 to the relieving of  
 painful attacks by small  
 doses of morphia administered  
 hypodermically. These  
 attacks were not very  
 frequent, and he was  
 very little annoyed with  
 depressed spirits. Not-  
 infrequently, during my  
 visits I was treated to  
 a plaintive old Scotch  
 melody, warbled with a  
 wonderfully hale voice  
 and occasionally to a  
 more humorous ditty with

with pantomimic violin accompaniment.