THE QUESTION OF CASTRATION FOR ENLARGED PROSTATE.[1]

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THE importance of the question of castration for reduction of enlarged prostate and the interest it has for a considerable proportion of men who reach old age, makes it imperative that medical men should by frequent review of the facts as they accumulate, arrive as quickly as possible at a clear understanding of the possibilities and limitations of the operation.

Especially is it fitting that this Association should regard this question with solicitude, and should give it constant discussion until definite conclusions as to its scope are reached and widely accepted.

It was to us that Dr. White first made his important suggestion of the possible utility of this operation, and to us he read his very able paper introducing the discussion of the subject in New York, in 1895.

The present purpose of my remarks is to continue that discussion then begun, and to bring out the experience of the past twelve months.

In our efforts to determine the position of this operation after another year's experience of it, we have to consider both its rate of mortality and the restoration of function obtained by it. In connection with the latter inquiry it will be proper to examine the evidence bearing upon the question of what changes the prostate undergoes after the removal of the testes, and to determine, as far as possible, the kind of prostate which is likely to be affected favorably by the operation.

[1] Read before the American Surgical Association at Detroit in May, 1896.

Lastly, it is proper to inquire whether any remote physiological or pathological effects are to be looked for after the loss of the testes.

Rate of Mortality.—It was a great surprise to many of us, when the results of the first year's work were published, to find that the question of mortality had any substantial weight in the consideration of this operation. The injury is so slight that we had expected the death-rate to be a trifling matter. Instead of this it assumed very considerable proportions.

Further experience shows that this mortality was not an accidental happening in the first one hundred cases. The statistics collected for this paper show a continuance of the deaths in about the same proportion of cases as in Dr. White's first series.

Before presenting the figures that I have deduced from the list of cases appended to this paper, I wish to say a word about the difficulties I have met, and the efforts I have made to correct, as far as possible, the tendencies to error that I have seen.

The correct mortality rate of a new operation is always difficult to find. If statistics are collected from reported cases, our figures may be too favorable from the natural inclination to report successes, and from the tendency which unfortunately exists to put cases on record before sufficient time has elapsed for the determination of the final effects of the operation.

These sources of error may be reduced to a minimum by the collection of statistics through personal solicitation of well-known operators for records of all their cases.

In the preparation of the tables which accompany this paper, I have, in part, followed this plan and have sent to all members of the American Surgical Association and of the American Association of Genito-Urinary Surgeons. I have also sent to all other operators to whom I have been referred by members of either of these associations. I have, moreover, written to many of the larger hospitals for records of all the results obtained in them. In this way I have aimed to get as fair an estimate of the severity of the operation as possible. But in spite of every effort,

the cases obtained from published reports outnumber those obtained by personal solicitation.

In addition to the above difficulties, which are common to all operations, we have in the present instance other disturbing conditions which confuse our estimates. Many of the patients who submit to castration are already suffering from diseases of the bladder and kidneys that are constantly tending to a fatal issue, and many of them evidently die from these diseases rather than from the operation.

Dr. White, acting upon the recognition of this fact, eliminated thirteen of the twenty fatal cases in his first series, and thus brought the calculated death-rate down from 18 to 7 per cent.

Such a revision of statistics is proper when we are comparing this with other operations done upon patients in good health; but it is manifestly improper when we are making comparison of results with other operations and procedures carried out upon this same class of patients. It is this latter comparison that I propose to make in this paper.

All of these operations for the relief or cure of enlarged prostate are attempts to prolong the lives of patients already seriously handicapped by more or less advanced pathological conditions. The unsatisfactory nature of our material we have to accept, and in weighing castration with the operations of prostatotomy and prostatectomy it is evidently improper to rule out the cases in which death from pyelonephritis followed castration, unless similar cases are excluded from the statistics of the other operations.

Such discrimination is hard to exercise over series of reported cases: For the observation and report of the conditions before operation is usually not exact enough to enable the compiler to accurately estimate it. It would seem better, therefore, to take all the cases as they come, trusting to the unfavorable ones to distribute themselves with tolerable fairness through the different sets of statistics. Whatever errors arise from this course will correct themselves in time.

It may be urged that the simplicity and ease of the operation have led some men to castrate patients so desperately ill

that a more severe operation would not have been thought of. This is doubtless true; but we must remember that in the earlier days of prostatotomy and prostatectomy these also were looked upon as operations to which one must be driven by the extremest needs; and the first cases were therefore very unfavorable.

Even now these operations are only resorted to by surgeons, and only allowed by patients, after the discomforts and dangers of the condition are past the ordinary means of relief.

Finally, I have excluded from my table cases in which other serious conditions existed to complicate the prostatic hypertrophy, such as stone in the bladder and tuberculosis. The removal of a stone adds considerably to the dangers of the operation, and, on the other hand, it is a common experience to see symptoms apparently due to the prostate, disappear after the removal of a stone.

I have appended a table of the cases thus excluded in order that all the data concerning them may be at the disposal of future statisticians. I have, moreover, revised Dr. White's table on the same lines, which reduces his number of cases to 104 with 19 deaths, giving a mortality-rate of 18.2 per cent.

I have succeeded in obtaining reports of 99 additional cases, of which 20 died. Adding these to Dr. White's cases we have 203 cases, with 39 deaths, and for the whole series the mortality-rate is 19.4 per cent.

So high a death-rate for so slight an operation is surprising and requires explanation. In endeavoring to understand it, it must be remembered that an operation done for the relief of a serious pathological condition has its dangers greatly increased if it does not at once completely relieve the condition. This rule applies peculiarly to diseases of the urinary organs in which the kidneys are partly disabled.

We see constant examples of this in the treatment of strictures of the urethra; and know that a slight surgical interference which does not wholly open the stricture is more likely to be followed by serious trouble than a far more extensive operation which entirely removes the obstruction and allows of the free escape of the urine.

In the enlarged prostate we have a closely analogous condition, and it is plain that the usually slow removal of obstruction by the shrinkage of the prostate after castration is of little immediate use in stopping the back pressure on the kidneys, which is especially harmful when an operation has just brought a stress of work upon them, and which, moreover, favors the extension of inflammatory processes from the bladder up the ureters to the renal pelves.

This is a very real source of danger and may go far towards explaining why there is so slight a difference in the mortality-rates of castration and of prostatectomy. For the latter, though a much more severe operation, leaves the escape of urine amply provided for by drainage.

In endeavoring to estimate the value of prostatectomy we meet the usual difficulty in following the patients after operation for a sufficient time to establish what the final and permanent degree of relief is. It is greatly to be desired that such statistics should be collected, for upon them must be based our final opinion of the operation. Even the mortality-rate is difficult to come at.

This is peculiarly an operation in which a correct technique and skill in carrying it out make the greatest difference in the fatality of the operation. As a result of this, its statistics show a constant improvement in the rate of mortality, and Dr. White found that the most modern statistics obtainable at the time of his paper, in 1893, give a mortality of 14.9 per cent.

Later, in comparing this operation with castration, he says, "The mortality of the first extensive series of suprapubic prostatectomies published was 25 per cent. The mortality of my table of a slightly larger number of cases is 18 per cent., including every known death, even when it occurred months after operation."

This comparison is hardly just, for the first castration in the series was done probably with as much skill and safety as the last one; while in the case of prostatectomy this was quite otherwise, and the first cases, treated while the operation was in its experimental stage, showed a mortality which has been greatly reduced since.

It seems probable that with added experience, the greater improvement in the mortality will show itself in the more difficult and complicated operation rather than in that "simple, easy, rapid procedure," which, as Dr. White says, is "without danger *per se*."

The latest table of statistics that I have been able to obtain is that of Moullin, which contains 94 cases with 25 deaths, giving a mortality of 27.6 per cent.

The death-rate of 14.9 per cent., figured out by Dr. White, was obtained by taking the cases in Moullin's table that were operated after 1889. He states that there were 47 of them with 7 deaths. To arrive at these figures some of the cases must have been eliminated, as I find 51 cases after 1889 with 9 deaths, giving a somewhat higher rate of mortality,—namely, 17.6 per cent. There might well be a difference of opinion as to eliminating some of the cases, but I think the higher death-rate (17.6 per cent.) the fairer estimate.

Dr. Belfield's table, which includes many of the cases also obtained by Moullin, is compiled of cases operated after 1886 and before 1890. It contains 55 cases of suprapubic prostatectomy with 14 deaths, which gives a mortality of 25 per cent.

These tables are open to the objection stated earlier in this paper as applicable to all statistics,—namely, that successful cases are more commonly reported than failures.

On the other hand, the technique of the operation has been greatly improved since their publication. (Belfield's in 1890, Moullin's in 1892.)

I am inclined with some diffidence to advance the belief that the correct death-rate is certainly under 20 per cent. If this is true, the operation stands upon about the same footing as castration in its fatality when applied to all cases of advanced prostatic hypertrophy. This would leave the choice dependent on the functional results to be expected from each. It seems probable that the aggregate death-rate can be sensibly lowered by using both operations with a careful selection of the cases to which each is applicable.

After-Effects of Castration.—Besides the mortality risks of the operation, we are constantly asked by patients whether there

is any danger of their suffering from eunuchism in any form after the castration. In studying the incidental after-effects of castration it is proper to consider what other functions the testes have to perform in the human economy besides that purely sexual.

Dr. White holds that the power exerted by the testes in conferring upon the bearer masculine characteristics is the only non-sexual attribute which they have. Also, he states, that this power ceases in early adult life, after which only their sexual function remains.

There is certainly, among all the reported cases that I have found, none in which, after castration performed in middle or advanced age, any loss of masculine characteristics or any appearance of feminine characteristics has been noted. Whether these patients will show less vigor as age advances than might have been expected of them, it is still too early to say. There are, however, some observations which it is proper to remember in this connection, and which should lead us to be watchful for evidence on this point.

It is a somewhat prevalent opinion among neurologists that the testes do exert some influence on the nervous system even in old age. The nature of this influence does not bear very exact statement on account of the difficulty of investigating such a question.

Brown-Séquard's experiments in the use of testicular extracts led him to claim for them a distinct power to increase the force of the nerve-centres, and consequently to improve the nutrition of the individual.

If this is so, the numerous cases of castration done in the last two years ought to give the opportunity for the study of the effect upon the nervous system of removing the normal supply of testicular fluids from the economy.

Looking at our cases for evidences of special nerve disturbbances, we find that in ninety-nine cases there were eleven instances of mental disturbance immediately following castration. A serious maniacal condition occurred in six cases, and in five others there was considerable loss of mental balance with, in several, a melancholic tendency. Of the six maniacal patients

one had shown symptoms of mania previously. The attack was apparently precipitated by the operation.

In this connection it may be worth while to briefly allude to a case of my own which has been previously reported, but is not included in my table as it was complicated with stone. It is of sufficient interest to be repeated here.

In December, 1894, I saw James W., a strong man of seventy-five years, who had been troubled for five years with considerable difficulty in connection with urination. At the time that I saw him the catheter was being used regularly, as he was unable to pass water without it. He was then suffering from an acute attack of inflammation. This subsided somewhat after rest in bed, but during his treatment the catheter touched a stone and an operation was decided upon.

On January 2, 1895, the stone was easily crushed and pumped out. The patient being in good condition at the end of this operation the testes were removed. Previous to the operation the patient was for the most part clear mentally, but occasionally had slight confusion of ideas. He tore off the dressing after recovery from ether, and was in a distinctly bad mental condition the following day. From this time he continued in a mildly maniacal condition, which persisted through the month of January, and presented the typical form of confusional insanity, with occasional exacerbations when he was quite maniacal and noisy. For some days after the operation he had considerable pain and increased resistance over the right kidney.

During this time the wound in the scrotum healed kindly, and the prostate diminished considerably in size, making the passage of the catheter much easier than it had previously been. On February 14 he passed some water voluntarily. On February 19 he was as much confused as ever, his mind occupied with delusions and often much depressed, referring constantly in his talk to the loss of his testes and to his business troubles. It was now decided to try the effect of the injection of testiculin.

On February 28, when he had been for eight days receiving from thirty to forty minims daily, the record was made: "The injections are very painful and are hurting him much. His mental condition has changed decidedly since they were started. His friends, who do not know the character of the treatment, are much pleased with the

change which they began to notice two days after the first injection. He is less restless, sleeps better, and worries less."

On March 6 we have the record: "For the past four days the testiculin has been omitted, and there is a decided change for the worse, his condition having become much as it was two weeks ago. March 16, testiculin is being used every day. Mental condition constantly improving."

After this, the injections having been very painful, they were omitted, and the mental condition continued steadily to improve. He was able to use a silver catheter himself, and finally left the hospital March 30.

I heard later from his physician, Dr. C. D. Sawin, of Charlestown, that Mr. W. did quite well and went about with some degree of enjoyment and comfort. Some time towards the end of May, after a long ride in a carriage, he was again taken down with acute symptoms with considerable pain referred both to the bladder and the region of the right kidney. This was accompanied by high fever and delirium; and he gradually failed and died.

Dr. Sawin was able to get a partial examination and found the prostate about the size of a hen's egg. The third lobe was enlarged to the size of a pullet's egg, and projected upward and backward into the bladder. On its apex was a calcareous deposit firmly adherent. Posterior to this, extending forward in the body of the prostate, was a cavity with smooth walls which contained about a teaspoonful of gravel. The bladder wall was thickened and injected, and showed on its surfaces a few hæmorrhagic spots. The kidneys were in a state of acute pyelonephritis, and the right was about one-third larger than normal.

I know of no other instance in which testicular extracts have been used in such a case as this, but the immediate improvement which followed confirms the belief that the loss of the testicles had something to do with the mania, and suggests the importance of a further trial of these extracts in similar cases. Care was taken that neither the patient nor the friends should have any idea of what was being given or what results were expected, so that the possible effect of suggestion should be reduced to a minimum. This would seem to be a necessary precaution in any

similar trial; for suggestion is a powerful therapeutic agent in such functional nervous disorders.

Besides these immediate and psychic disturbances there are other cases in which the operation has a very decided depressing effect on the general strength of the patient, leading to an amount of shock quite out of proportion to the extent of the mutilation.

In other cases, again, the patients have borne the operation well, the wounds have healed kindly, and still, at the end of a fortnight or, perhaps, a little longer, they have gradually failed without any marked change in their symptoms and have died. If a case of this sort comes to autopsy, it usually reveals a condition of pyelonephritis, and the death is perhaps sufficiently explained thereby. It is, nevertheless, a striking and suggestive fact that these patients who have been carrying the load of partially disabled kidneys for a long time, after a slight operation, which heals kindly, gradually succumb by progressive loss of strength without any evident increase of symptoms pointing to an aggravation of the renal condition.

This seems to indicate that, by the removal of the testes, the vital force of the patient has been in some way diminished, and thus, in a measure, the theory of Brown-Séquard finds support.

As a further evidence of the effect produced upon the nervous system by the removal of the testes, it has been noticed in a number of cases that the patients afterwards suffer from uncomfortable flushes of heat, similar to those experienced by women at the time of the menopause. Also distinctly hysterical phenomena have been observed after castration. On the other hand, cases are reported in which conditions of nervous excitability existing before have been relieved by the operation.

Restoration of Function.—In seeking for a true appreciation of the functional results obtained by castration and by the various more direct operations upon the prostate, we meet even greater difficulties than in our search for the correct mortality rates.

It is, in this investigation, even more important to have the patient under observation for a considerable time to determine the permanency of the result which follows immediately after the operative interference. It often happens that what appears a

very satisfactory degree of relief, as long as he enjoys the rest and skilled treatment of a hospital, will disappear soon after he assumes less regular habits of life.

Indeed, the time which has elapsed since the operation of castration began to be practised is still too short to determine how permanent will be the changed condition brought about by it.

A few cases of relapse have, however, occurred in which there has been a distinct return of irritability and obstruction. Dr. Gavin's case, which was one of the most brilliant of the early cases reported in Dr. White's table, is one of these. Time only will show how frequent these are to be.

In the effort to obtain data upon this point I have written to the operators mentioned in Dr. White's table whose cases were reported but a short time after operation. I received answers from twenty-seven out of forty-one addressed, and most of the reports were favorable.

An analysis of my table shows that seventy-nine cases survived the operation. In eighteen of these the reports were not sufficiently explicit to enable one to form an opinion as to the functional result. We have left, then, sixty-one cases for our purpose.

Of these, five cases showed no improvement; one case improved at first and later suffered a relapse. In four cases the catheter was still required, but entered more easily, and in these cases the irritability of the bladder was sensibly diminished.

In twenty-seven cases retention, which existed at the time of operation, afterwards disappeared. In seven of these cases the retention was acute,—that is, had existed for less than a month,—while in the other twenty the retention was of long standing. In two striking cases a catheter life of eleven years in one case and eighteen years in the other was terminated by the operation, and comparatively normal urination was restored.

The remaining twenty-four cases were ones in which the power of urination had not been wholly lost, but was greatly impaired, making the act frequent and often painful. In all of these cases a decided improvement was reported; the gain showing itself in a diminution of pain and frequency and often a decrease in the amount of residual urine.

Reducing these facts to percentages, we find that these cases show 9.8 per cent. failure; 6.6 per cent. moderate improvement; and 83.6 per cent. of substantial or very great improvement.

If further experience justifies these figures, we shall be able to express the facts thus to our inquiring patients,—You have eight chances in ten of getting through the operation all right, and if you are successful in this, you have again eight chances in ten, or a little better, of getting very substantial relief from your urinary difficulties.

Let us now compare these facts with the corresponding data in regard to suprapubic prostatectomy.

Taking those cases in the table of Moullin which occurred after 1889,—that is, after the first experimental stage of the operation was past,—we have forty-two cases: of these six are not sufficiently explicit for our use, leaving thirty-six cases. Of these, three showed no improvement, which gives 8.3 per cent. not improved; three cases, again 8.3 per cent., were somewhat improved; while in the remaining thirty cases, 83.3 per cent., the power of urination was restored with a corresponding improvement in their condition.

These figures, as will be seen, correspond very closely with those just deduced for castration.

We have shown, then, that, as far as can be judged from the statistics at our disposal, the two operations are astonishingly parallel in their results, both as to mortality and as to restoration of function.

The Changes in the Prostate which follow Castration and lead to a Diminution in Volume.—A few facts have been observed within the past year which throw some light upon the way in which the reduction in the size of the prostate comes about.

Two theories have been advanced to explain this. First, there have been those who believed that the shrinkage of the gland was wholly or in greatest part due to an atrophy of the constituent parts of the organ.

This atrophy was believed to affect mainly the glandular and muscular parts. Dr. White[1] reports the microscopical appearances

[1] ANNALS OF SURGERY, July, 1895.

in a case of his own, in which the patient died on the evening of the second day, as follows:

"The stroma of the gland shows beginning proliferation of the connective tissue cells, but especially of the muscle cells." "The acini tubules are also becoming filled with proliferated columnar cells, and here and there some fine granular matter may be seen in the tubules; some of the cells appear to contain fine granules which have not taken the stain, evidently fat. The changes are typical of beginning atrophy." The observations of Griffiths[1] and Kirby[2] seemed to show that it was the glandular tissue which first atrophied and disappeared.

In endeavoring to estimate the value of these observations, the earlier investigations of Griffiths[3] in regard to enlargement of the prostate are interesting. He believed that the hypertrophy consisted first in a growth of the gland tubules with their associated muscular tissue. This he called the first or glandular stage.

Secondly, after a variable time, he found that a degenerative change occurred which converted the new tissue into more or less dense fibrous connective tissue, containing only the atrophied remains of gland and muscle elements. This he called the second or fibrous stage. In another place he says that "in the enlarged gland there is usually a tendency in small patches, here and there, to atrophy of the gland tubules and to disappearance of the muscular fibres in the stroma and to the formation of fibrous connective tissue, and this may in some instances extend through the substance of the gland."

The changes thus described are so closely similar to those which he thinks he has found in a case of castration, examined after eighteen days, that there might well be doubt whether the condition which he thought due to the effect of castration might not have been one of degeneration already started before castration was done.

Albarran,[4] who has also made microscopical study of prostates after castration, is unwilling to accept White's and Griffiths's observations as evidence of atrophic changes, and says that he

[1] ANNALS OF SURGERY, August, 1893.

[2] British Medical Journal, March 16, 1895.

[3] Journal of Anatomy and Physiology.

[4] Annales des Maladies des organes genito-urinaires, December, 1895.

has seen similar conditions to those pictured by Griffiths in cases that had never been castrated.

Moullin[1] reports the examination of a case that died twenty-nine days after castration, in which Mr. A. B. Roxburgh was unable to make out any histological change, although the prostate was distinctly reduced in size.

I have myself made examination of sections from the prostate of a patient who had been castrated seven days before death, and by comparison of them with sections from the hypertrophied prostate of a non-castrated patient, have failed to find any difference which could be ascribed to the castration.

In another case examined by me, Dr. Post had castrated the patient seven weeks before death. Immediately following the operation there was some improvement, the patient, who had required the catheter for four weeks previously, passed a little urine and after this there was some involuntary escape of urine. After six or seven days the catheter was again required. In the next month he passed considerable water but required the catheter four to six times in twenty-four hours. Eleven days after operation the prostate was a little softer but no smaller.

At the autopsy the prostate was about the size of a pullet's egg; it was of firm, even consistency. The bladder wall was thickened and trabeculated. The right ureter was occluded by the encroachment of the right lobe of the prostate, and there was hydronephrosis of that kidney.

A microscopic examination of the prostate showed an almost complete disappearance of all glandular elements with a great increase of involuntary muscular tissue. The fibrous tissue was in about normal quantity.

The fact that there had been no considerable diminution in the size of the gland makes it improbable that the gland tissue had disappeared since the castration. There were no remnants of gland tissue or alveoli filled with *débris*, such as would be expected had such been the case.

This observation would seem to show that the myomatous tissue of the prostate is not essentially affected by castration.

It is, then, manifestly difficult to determine in a given case

[1] London Lancet, November 30, 1895.

whether the conditions in the prostate, found after death, are due to changes following castration, or are degenerative changes already occurring in a pathological organ before the castration was done.

This question, as to the correctness of such observations as are reported by Dr. White, and others can only be settled by an accumulated mass of evidence obtained by numerous examinations of the prostates of castrated patients brought in contrast to another mass of evidence obtained by control examinations of hypertrophied prostates from non-castrated patients.

Such an array of evidence does not yet exist, and the exact pathology of the change remains to be worked out. When this evidence has been obtained we shall hope to understand why, in some cases, little if any diminution in the size of the gland occurs, while in others an enormous shrinkage takes place; also, why the changes appear so much more quickly in some cases than in others.

The second theory accounts for the reduction in size by supposing it to depend largely upon changes in the vascularity of the organ. The quick relief of retention which follows, sometimes immediately upon the operation, is best explained by ascribing it to a diminution of the blood in the gland. Dr. White has expressed the opinion that a slight change in the size of an obstructing third lobe would often cause a marked improvement in urination, and is inclined to explain these cases of rapid improvement in that way. For, as he says, the third lobe is very rich in glandular elements, and these he believes to be the first to atrophy.

These considerations seem hardly to account for the improvement which occurs within a few hours; certainly too short a time for decided anatomical changes to occur. They also do not account for the return of obstruction observed in these cases. Indeed, this recurrence of retention opposes any belief in early anatomical changes.

These phenomena are better explained by the vascular theory, and the observations of Mr. Mansell Moullin are interesting in this connection. He calls attention to the above-mentioned, not uncommon experience, that immediately following the operation

there is a decided change in the prostate, often allowing a return of the power of urination, and that in a short time this restoration of function is again lost to perhaps reappear later when the more permanent changes occur.

He seeks to explain this by supposing that nerve fibres, irritated by the tying and division of the spermatic cord, send impulses to the central nervous system which are reflected along the vasomotor nerves,[1] and that in this way is brought about a temporary reduction of congestion and diminution in size.

To support this view of reflected nervous influence he reports a case in which a painful spasm of the sphincter ani muscle followed operation, and subsequently disappeared as the first effect of irritation wore off. This effect produced through a nerve closely allied to those supplying the prostate certainly gives his theory strong support. The close relation between the nerves of the anus and those supplying the vesical neck is well known, and is constantly illustrated by the familiar observation that an irritation about the anus leads to retention of urine.

The vascular arrangement in the prostate must be remembered in order to fully understand its importance in assisting encroachment upon the urethra.

Griffiths, who has investigated this, says, "I have been struck with the regularity with which venous channels, almost amounting to a plexus, are found in the anterior wall of the prostatic urethra. These venous channels are more numerous towards the middle of the prostate, and they are placed immediately adjacent to the mucous membrane in the somewhat dense submucous tissue, being only covered by the epithelium." "These, in addition to similar, though less numerous and less prominent, veins in the hinder wall, and which are in like manner situated immediately beneath the epithelium near to the neck of the bladder, explain the easily excited and considerable hæmorrhage from the prostatic urethra, of not unfrequent occurrence after the passage of instruments."

The venous arrangement above described, closely applied about the urethra, explains how any diminution in the determi-

[1] It is possible that some of the effect may be produced by contractions induced in the muscular fibres of the prostate.

nation of the blood to the part might at once considerably lessen the obstruction to urination.

It is probable, then, that the alteration in the blood-supply plays a very considerable *rôle* in the changes observed in the prostate after castration; while the atrophy and disappearance of portions of the gland may perform their part in the final permanent reduction in the size of the organ.

The observations upon the prostate after death, during the past year, have not borne out the opinion that the third lobe is especially prone to shrink after castration.

I have seen three specimens from castrated patients in which the third lobe existed as a large and obstructing body.

The impossibility of telling exactly the size of the third lobe before castration prevents our forming any idea of the amount of atrophy that may have occurred in it. We can only say in such cases that the atrophy has not been sufficient to remove the obstruction.

While uncertainty exists as to the processes by which shrinkage of the hypertrophied prostate is brought about after castration, there is no doubt that in a great part, if not a majority, of the cases a considerable diminution in size follows the operation. This is usually estimated by the rectal touch and by the shortening of the urethra, as shown by the length of catheter required to reach the bladder.

Both of these methods are imperfect and sometimes misleading, but they are the best at our disposal, and upon them we have to rely for our information in this matter.

I am not aware of any cases in which the size of the third lobe has been accurately mapped out and watched by intravesical examinations, either with cystoscope or sound.

Choice of Operation.—It may now be profitable for us to consider what conditions should have an influence upon our choice between these two operations for the cure of an enlarged prostate. A study of our cases shows that a large succulent prostate gives the greatest improvement after castration, and in such a case where the close apposition of the lateral lobes plays a large part in the obstruction, relief after castration may be expected with a good deal of confidence.

A case of this sort is especially promising if the bladder is still free from bacterial invasion, so that the danger of pyelonephritis is reduced to a minimum. These cases, too, are not especially favorable for prostatectomy, as, in order to relieve the obstruction, large portions of the gland have to be shelled out, and the operation assumes very serious proportions.

When, however, the obstruction is due to a valvular third lobe, or to masses projecting back into the bladder and encroaching on the internal orifice of the urethra, we have a condition which has not shown itself to be greatly affected by castration.

On the other hand, this condition is easily and radically treated by prostatectomy, and the injury inflicted by the operation is not serious. In these latter cases the prostate is often not large, and yet the obstruction is very complete.

Between these two conditions we have every degree of combination of obstruction by pressure and obstruction by valve, and this forms the debatable ground over which the two operations must contend for supremacy, and as yet we have not sufficient knowledge to properly apportion the territory between them.

Of one thing I feel convinced, however, and that is that in a case of doubt the question of whether the urine was still in an aseptic condition would have considerable weight with me, and I should often dare to do a castration if the urinary organs were still uncontaminated, when if the urine already contained pus I should prefer the suprapubic operation with the drainage that it affords.

A question which interests me in this connection is in regard to those cases of considerable dilatation of the bladder after long chronic retention, cases in which an attempt to institute the catheter-life is not infrequently followed by a fatal hæmorrhagic cystitis or pyelonephritis. It seems possible that in such cases a castration done without any interference with the bladder might sufficiently remove the obstruction to allow the distended viscus to gradually relieve itself without any of the dangers of infection so fatal under these conditions.

As far as we know, the myomatous and distinctly fibroid prostates are not especially affected by castration. The difficulty of recognizing such a condition before operation must, however,

make the possibility of applying this knowledge extremely rare.

Ligature and Division of the Vas Deferens.—In consideration of the nervous disturbances that follow castration in advanced life, it becomes interesting to study the cases in which ligature and division of the vas deferens have been practised. The idea naturally arises that if in this way the testicles can be retained and at the same time the shrinkage of the prostate can be brought about, perhaps the nervous depression can be avoided and still the obstruction be removed.

I have obtained reports of twenty-two cases which give a most unfavorable showing for this operation, for seven of these patients died. Of these cases of death, two were due to hemiplegia coming on shortly after operation; one was a case of suicide in a man who became maniacal after operation, and the others were due to internal conditions, usually of the kidneys. Of the remaining fifteen, three showed no relief, improvement was moderate in five, but one of these subsequently relapsed, and great improvement followed in seven.

The number of cases is too small to enable us to draw any conclusion either as to the mortality or the degree of improvement which can be expected from this operation; but even these few cases seem to show that the operation has no advantage over castration in point of mortality, while it is less satisfactory in obtaining relief.

Unilateral Castration.—But few observations have been reported of this operation within the year, and these are not of any decisive value, as in some few of them a decided diminution of the corresponding lobe of the prostate was observed, while in others no change in the gland could be detected.

The author has had one experience in this connection, having had an opportunity to examine a patient operated upon by Dr. J. W. Elliot. Examinations were made both before and after the removal of one of the testicles. The castration was for a very large hydrocele with possible testicular disease.

In this case the diminution in size of the corresponding half of the prostate was very noticeable, showing both diminution in size and a softening in consistency. This observation was confirmed by other observers.

In this case there had been no obstruction to urination, so that no light was thrown upon the question whether this unilateral shrinkage makes the urethra more permeable.

Conclusions.—The conclusions which, I think, we may draw by this examination of the subject are the following:

(1) In the matter of mortality the operation of prostatectomy has a slight advantage over castration. It seems probable that, with later statistics reflecting the last improvements in the technique of prostatectomy, this advantage would be further increased.

(2) Prostatectomy has the further advantage that it allows of a thorough examination of the bladder and of the discovery and correction of other conditions not before suspected. Stones are frequently removed in this way without adding to the gravity of the operation. In several reported cases of castration the absence of improvement has led to the subsequent discovery of stones which have required other operations for their removal.

(3) Prostatectomy has, on the other hand, the disadvantages that it confines the patient for a longer time and that it is sometimes followed by a fistula. This occurred in one of the forty-two cases used in this paper.

(4) It is too early to know whether any permanent loss of vigor follows castration when done on old men. The nervous effects which sometimes immediately follow the operation suggest a suspicion that with the testes the system may lose some tonic effect exerted by those organs.

(5) The functional results of the two operations seem, at present, to be as nearly equal as possible, and the tendency to relapse shows itself in about the same proportion of cases after either operation.

(6) The reduction in the size of the prostate after castration is largely due to a diminution of congestion. Later a degeneration and absorption of considerable portions of the gland may occur. The glandular elements are particularly affected by this atrophy.

(7) Castration would seem to be especially efficacious in cases of large tense prostates when the obstruction is due to pressure of the lateral lobes upon the urethra.

(8) Castration is of but little use in myomatous and fibrous prostates.

(9) Prostatectomy has its especial field in the treatment of obstructive projections which act in a valvular way to close the urethra. There is, however, no form of prostatic obstruction which a skilful operator may not correct by prostatectomy.

(10) Prostatectomy is then applicable to more cases than castration, and is especially to be selected when an inflamed condition of the bladder makes drainage desirable.

TABLE OF CASES OF CASTRATION FOR THE

No.	Age.	Date of Operation.	Condition of Prostate, Bladder, and Kidneys as far as Ascertained.	Immediate Effect.
1	57	May 24, 1895, J. W. Hauckley.	Prostate enlarged and hypertrophied; hæmaturia; retention; irritability of urethra and bladder.	Irritability of urethra and bladder immediately improved and able to urinate at will in twenty-four hours.
2	65	March 15, 1895, S. C. Gordon.	Prostate very large, irritable, and painful; frequent micturition; catheter; small amount of albumen.	Prostate very much smaller.
3	73	June 19, 1895, S. C. Gordon.	Prostate very large; bladder excessively irritable, requiring to be relieved every hour; hæmaturia.	. . . . .
4	83	July 29, 1895, S. C. Gordon.	Incontinence of urine; severe cystitis; prostate very large; catheter used constantly.	August 1 passed ℥iv, and continued to empty bladder without catheter.
5	68	May, 1895, R. Park.	Bladder sacculated; perineal distance greatly increased; urine alkaline.	No immediate effect.
6	65	July, 1895, R. Park.	Constant use of catheter; tenesmus extreme; partial bladder paralysis; enlargement in all directions.	. . . . .
7	70	December, 1895, R. Park.	About like Case 6; tenesmus not so urgent; prostate not quite as large.	Improvement noticeable in two weeks.
8	71 D.	April 13, 1892, J. R. Weist.	Prostate much enlarged; chronic cystitis; urination very frequent and painful; castration for chronic neuralgia of testes.	No improvement of bladder and prostate.
9	69	June 8, 1895, J. R. Weist.	Prostate much enlarged; urination painful; catheter frequently employed; testes painful.	But little improvement for six months.
10	55	July 19, 1895, L. S. Pilcher.	Moderate enlargement; bladder dilated, atonic; no cystitis; stillicidium; never used catheter, but catheter passes readily.	At end of two months still dependent on catheter, but can spontaneously void all over sixteen ounces.
11	68	July 31, 1895, L. S. Pilcher.	Moderate enlargement; bladder dilated, atonic; stillicidium; catheter passes readily.	After seven days can spontaneously void all over thirty-two ounces.
12	72	October 10, 1895, L. S. Plcher.	Moderate enlargement; bladder dilated, atonic; stillicidium; catheterization difficult.	After seven days catheter passes easily; after twenty-one days complete spontaneous evacuation of bladder.

REDUCTION OF ENLARGED PROSTATE.

Post-Operative Mania.	Final Effect of Operation on Prostate, mentioning Time when Change made Itself Observed.	Subsequent History of Patient.
Decided mania, more or less persistent now.		
. . . . .	No catheter required; discharged cured March 9.	
. . . . .	Was relieved in two weeks; discharged July 10; able to retain urine three to four hours and passes most of it naturally.	March, 1896. Continued to improve and now empties bladder voluntarily, but for safety uses catheter each night.
. . . . .	November, admitted with calculus; suprapubic cystotomy; found prostate entirely absorbed except the capsule.	Died from uræmia within a week after operation for calculus.
. . . . .	Gradual improvement.	
. . . . .	Forty days later patient reports free from pain with fair expulsive power; catheter only to void residual urine.	February, 1896. Patient a "new man," urinates normally; no residual urine; no complaint of bladder.
. . . . .	. . . . .	March 3, 1896. Very great general improvement in every respect; patient now quite comfortable.
Mania followed in ten days, lasting six weeks.	None; mania lasted six weeks; general debility and melancholia until death of uræmia, one year after operation.	
. . . . .	Catheter not employed after six months; cystitis nearly disappeared; prostate much reduced in size.	In this case the scrotum and both testicles removed by patient; scrotum was stretched over a bench by a loop of bandage which was nailed to bench; a large chisel was employed, part of a brick being used as a mallet; patient is now very well and proud of his achievement.
. . . . .	At end of six months condition unchanged.	
. . .		
. . . . .	Progressive improvement in local conditions up to date of death, two months later of dysentery.	
After fourteen days mind became disturbed coincident with suppuration and sloughing in wound.	End of three months prostate nearly normal in size; function of urination normal.	Mental condition much improved as local healing progressed, but at end of three months is still more feeble than before operation.

TABLE OF CASES OF CASTRATION FOR THE

No.	Age.	Date of Operation.	Condition of Prostate, Bladder, and Kidneys as far as Ascertained.	Immediate Effect.
13	53	October 23, 1895, L. S. Pilcher.	Prostate moderately enlarged; bladder contracted, much hypertrophied; chronic cystitis; entirely dependent on catheter for five months, off and on for five years.	After six days began to urinate spontaneously.
14	65	February 3, 1896, L. S. Pilcher.	Prostate greatly enlarged; absolute retention; suprapubic cystotomy; bladder contracted and walls hypertrophied.	After ten days began to void urine *per urethram;* end of three weeks no perceptible change in size of prostate.
15	77	October 31, 1895, W. W. Keen.	Prostate enlarged; five to six ounces residual urine; bladder irritated by constant use of catheter; kidneys in good condition.	Three weeks later no change as to prostate or urine.
16	72	October 25, 1895, Jos. Ransohoff.	Prostate greatly enlarged; suprapubic cystotomy; lateral lobes of prostate found enlarged, forming an almost complete ring, projecting an inch into bladder; kidneys normal.	Negative.
17	60	February 24, 1894, Geo. R. Fowler.	Prostate much enlarged; cystitis; residual averaged seven ounces; was operated on by Dr. Cabot one year before (litholapaxy).	End of two weeks micturition every six hours with practically no residual.
18	80 D.	October 16, 1895, J. B. Roberts.	Middle lobe enlarged; not much change in lateral lobes.	Negative.
19	79 D.	April 15, 1895. (?)	Prostate enlarged posteriorly, hard and smooth; pus, blood, and bladder epithelium in urine; urine alkaline and passed with difficulty.	Urine passed involuntarily off and on first week.
20	64	April 4, 1895, John Homans.	Prostate enlarged; bladder weak and atonic; urine drawn by soft catheter when possible, by silver prostatic when not; kidneys fairly normal.	Soft catheter passed with ease, and after this passed his urine without help.
21[1]	D.	December 17, 1895. C. B. Porter.	Chronic hypertrophy of prostate.	. . . . .
22	55	February, 1895, Dr. F. Henrotin, operator; reported by Dr. W. T. Belfield.	. . . . .	. . . . .
23	80 D.	September 14, 1895, J. W. Elliot.	Prostate symmetrically enlarged, smooth and hard, not tender; bladder irritable; chronic cystitis; no kidney elements found in urine.	No relief to retention.

[1] This case is repeated at No. 37. Its removal from the statistics improves the result slightly.

REDUCTION OF ENLARGED PROSTATE.—*Continued.*

Post-Operative Mania.	Final Effect of Operation on Prostate, mentioning Time when Change made Itself Observed.	Subsequent History of Patient.
. . . . .	End of three months spontaneous urination has continued, but catheter is introduced every night to completely empty bladder; three to seven ounces residual urine always found.	
. . . . .	February, 1896, still has to use catheter once daily; three to four ounces residual urine; is more comfortable than before operation.	
. . . . .	Gradual reduction; four and a half months later prostate is reduced one-half; uses no catheter; urinates twice in night; no pain.	
. . . . .	When last seen improvement in symptoms seemed out of all proportion to extent of diminution in size of prostate, which was slight.	March 19, 1896. Patient writes that he is well; organs performing functions freely and no use for catheter.
. . . . .	No change observed; death occurred too early to permit of benefit.	Died fifth day; no autopsy; death not due to operation, but to condition of patient, which was bad.
Mind had been failing before coming into my wards at hospital.	Died May 11; passed out of my hands May 1; records say, "he passed now clear and now bloody urine; mind failed rapidly until the end."	Afterwards learned that this patient had attacks of dribbling and dysuria off and on for some time, and was sent to hospital because attending physician thought he would die.
. . . . .	January 28, 1896, no trouble in passing water since operation; prostate normal size to touch or rather small; general condition much better than before operation and works as teamster; piles were cured by operation.	
. . . . .	Died four days after operation at Massachusetts General Hospital.	
. . . . .	Eighty days after operation prostate two and a quarter inches long; no change, subjective or objective, in urinary symptoms nor size of prostate.	
Marked increase in senility; patient frequently out of his head before and	No change noticed in size or character of prostate.	Patient gradually failed till death, October 5, 1895; secreted forty to fifty ounces daily. *Autopsy:*

TABLE OF CASES OF CASTRATION FOR THE

No.	Age.	Date of Operation.	Condition of Prostate, Bladder, and Kidneys as far as Ascertained.	Immediate Effect.
24	64	July 30, 1895, M.H. Richardson.	Bladder inflamed; prostate enlarged, tender, soft, congested; kidneys normal.	. . . . .
25	73 D.	April 25, 1895, E. L. Keyes.	Prostate size of mandarin orange, soft; moderate vesical catarrh; urination possible only with catheter; kidneys sound.	Aggravation of pain, vesical spasm, and all other symptoms followed operation till death; urgency and pain frightful in intensity and frequency.
26	75	January 15, 1896, J. H. Packard.	Both testicles cystic; micturition frequent and painful. November 13, 1895, suprapubic cystotomy and stone removed.	January 28 is practically well; sleeping quietly six hours at night.
27	68	December 17, 1895, J. C. Warren.	Moderately enlarged, smooth, and hard prostate; right lobe distinctly larger than left; cystitis; nothing renal.	Passed water fifteen days after operation for first time in five weeks; nine days after operation prostate smaller and softer.
28	68 D.	July 2, 1895, R. W. Taylor.	Prostate greatly enlarged laterally and posteriorly; cystitis; chronic diffuse nephritis; four and a half ounces of residual urine.	After operation patient could pass water without much straining and did not urinate as frequently at night as before.
29	62	March 14, 1896, T.W. Huntington.	Prostate greatly enlarged; bladder seat of chronic inflammation; micturition frequent and painful; patient excessively nervous and begged for operation; no evidence of kidney-disease.	At first very slight improvement, but enough to justify operation; pus in urine considerably less.
30	77 D.	June 24, 1895, S.W. Torrey.	Prostate as large as small lemon; slight cystitis; pyelitis; intense distress; catheterized very frequently.	Immediate relief; catheter not required for three days, then needed for rest of life, though not as frequently as before operation.
31	65	March 15, 1895, Maine General Hospital; reported by Dr. S. H. Weeks.	Prostate much enlarged with considerable inflammation of bladder.	. . . . .
32	74	February 19, 1896. Maine General Hospital; reported by Dr. S. H. Weeks.	Prostate much enlarged.	Passes urine better.

REDUCTION OF ENLARGED PROSTATE.—*Continued.*

Post-Operative Mania.	Final Effect of Operation on Prostate, mentioning Time when Change made Itself Observed.	Subsequent History of Patient.
after operation; mental condition much worse after operation.		no middle lobe; kidneys practically normal. This patient died in the summer of 1896. A large sacculated stone was found.
. . . . .	Gradual diminution in size; perineal section June 10, 1895; castrated because we knew of nothing else to do.	Slight improvement of powers of urination; diminution of painful spasm of bladder during efforts of micturition.
Post-operative mental irregularity,—not maniacal but febrile.	Prostate to rectal touch seemed softer, not otherwise changed.	Death in fifth week, apparently from exhaustion.
. . . . .	. . . . .	March, 1896. This patient seems to be in excellent general health.
. . . . .	March 14, 1896, prostate slightly enlarged; has passed catheter but two or three times since leaving hospital; good general health; "it was a grand success," patient declares.	
. . . . .	About ten days after operation patient began to lose ground, and died of exhaustion on the nineteenth day; no change appreciable to exploration.	
Patient remains nervous and despondent.	April 11, 1896, reports that gland is perceptibly smaller, and patient now leads a comparatively comfortable life; before operation was as miserable as any human being could be.	
Developed senile dementia one month after operation.	Rapid atrophy; size diminished one-half in about one week.	Patient died August 21; developing senile dementia about one month after operation. Operation and convalescence aseptic.
. . . . .	March 12, 1896, patient asserts, "I am no better than before operation."	Subsequent history so far has shown no improvement.
. . . . .	. . . . .	Have not heard from him since he left the hospital.

TABLE OF CASES OF CASTRATION FOR THE

No.	Age.	Date of Operation.	Condition of Prostate, Bladder, and Kidneys as far as Ascertained.	Immediate Effect.
33	56	August 16, 1895, S. J. Mixter.	Retention and cystitis.	. . . . .
34	68	August 16, 1895, S. J. Mixter.	Cystitis; "catheter-life."	. . . . .
35	65	September 14, 1895, F. B. Harrington.	Symmetrical enlargement of prostate; "catheter-life."	. . . . .
36	56	December 7, 1895, C. B. Porter.	Symmetrical enlargement of prostate, both lobes; enlargement of middle portion; residual ℥xxvi.	. . . . .
37	59 D.	December 17, 1895, C. B. Porter.	Prostate double normal size; symmetrical catheter-life.	. . . . .
38	57	December 28, 1895, H. H. A. Beach.	Prostate three times normal, "reaching from spine to spine (ischial);" retention.	. . . . .
39	68	January 9, 1896, H. H. A. Beach.	Prostate twice normal; residual ℥v; cystitis.	. . . . .
40	64 D.	March 14, 1896, J. W. Elliot.	Symmetrical enlargement of prostate; residual ℥xxiii.	Apparent diminution.
41	75 D.	John B. Deaver.	Enlarged prostate.	. . . . .
42	62	February, 1895, Church.	Symptoms: great pain and difficulty in passing water; began seven years before, and had increased in severity; used catheter occasionally for a few years, but of late unable to pass it without excruciating pain; sometimes hæmorrhage; slight cystitis; prostate greatly enlarged; patient losing weight and in great pain.	At end of a week prostate appreciably smaller; pain trifling; able to pass water at times with catheter; at end of second week prostate one-third smaller; end of third week one-half former size.
43	71	August 28, 1895, Morton.	Increasing difficulty of micturition for some time, culminating in total retention; attempts to pass catheter caused hæmorrhage; enormously hypertrophied prostate; large as an orange, and soft; urine ammoniacal; much pus, and black with blood.	Bleeding ceased almost immediately, though catheterization continued; slowly improved and normal action three weeks after operation.
44	64 D.	Bangs.	Enlarged prostate; distended bladder; kidneys involved; not considered a suitable case by Dr. Bangs.	. . . . .
45	.	Manning, by Moullin, Lancet, 1896.	Prostate as large as a small orange.	In a few days urine passed in a fuller stream, and bladder had regained its tone.
46	69	Albarran, August, 1895.	Acute retention; prostate smooth and moderately hypertrophied; bladder	Afternoon of operation passed twenty grammes;

REDUCTION OF ENLARGED PROSTATE.—*Continued.*

Post-Operative Mania.	Final Effect of Operation on Prostate, mentioning Time when Change made Itself Observed.	Subsequent History of Patient.
. . . . .	"Up and around," September 5, 1895.	
. . . . .	Discharged much relieved October 5, 1895.	
. . . . .	Discharged much relieved September 21, 1895.	May, 1896. Returned to hospital for stone, with great pain and much suffering and discomfort.
. . . . .	Diminution of middle portion; residual ℥xii.	Discharged much relieved; result said to be excellent.
. . . . .	. . . . .	Died December 21, 1895. *Autopsy* revealed enlargement of middle portion of prostate, with right kidney in advanced stage of cystic degeneration.
. . . . .	January 1, 1895, prostate normal; discharged much relieved.	
. . . . .	Residual ℥i; discharged much relieved March 6, 1896.	
. . . . .	Died March 20, 1896. *Autopsy* revealed right kidney three times normal size; left kidney size of hen's egg; left ureter occluded.	
. . . . .	Died of chronic uræmia some days after operation.	
. . . . .	March, 1895. Only slightly larger than normal; practically no pain; slight atony of bladder made occasional catheter necessary, but this was painless; able to sleep four hours; general condition better.	
. . . . .	October 28, urinated four to six times a day with no distress; normal urine; prostate much smaller than two weeks after operation; very dense.	
. . . . .	Death in a week.	
. . . . .	One month later right lobe still enlarged, but smaller; left lobe normal.	Two months after stronger than for years; no urinary trouble at all.
. . . . .	July 25, 1895, prostate one-fifth smaller; catheter passes easily.	

TABLE OF CASES OF CASTRATION FOR THE

No.	Age.	Date of Operation.	Condition of Prostate, Bladder, and Kidneys as far as Ascertained.	Immediate Effect.
			insensible; pus in urine; catheter necessary.	getting better constantly; residual urine diminished.
47	74	October 26, 1894, Mansell-Moullin.	Enormous prostate; urine foul, ammoniacal; intense straining; used catheter for years; worn out with pain and loss of sleep.	Ten days later prostate decidedly smaller by rectum.
48	65	December 7, 1895, Stewart and Haynes.	Prostate enormously enlarged; great agony on account of inability to pass urine; symptoms worse for a year, and very severe for a month.	In a few days pain subsided, and he began to pass urine easily.
49	.	April, 1896, Parker.	Prostate enormously enlarged; had not passed urine normally for six months.	Passed urine six days after operation, and has continued to do so.
50	72	December 7, 1895, Reeves.	Diabetes for some years; prostate very large; difficulty in passing water for over four years; entirely dependent on catheter for four months: passing urine every half to two hours.	. . . . .
51	66	November 1, 1895, G. A. Bright.	Long time had frequent and difficult micturition; catheter many times daily; urine loaded with pus; poor general health.	Second day passed ℥ xiv voluntarily; general amelioration of symptoms at once; intermittent malaria followed.
52	64	May 20, 1893, Böckman.	Difficulty in urination for two years; passed water every fifteen to thirty minutes; prostate size and shape of half a lemon; some general arteriosclerosis; residual, 1500 grammes.	Six days later residual 900 grammes; prostate had begun to shrink.
53	63	May, 1895, Ross.	Catheter at times for three years; cystitis; urethritis; prostate three inches long and firm.	Five days after operation passed urine without catheter.
54	(?) D.	McGraw.	Passing purulent urine with some difficulty; using catheter himself.	Immediate relief.
55	.	December 31, 1895, Haynes.	Constant desire to micturate; sexual irritation; priapism.	. . . . .
56	69 D.	Boling.	Prostate size of ordinary orange; residual urine ℥ xxxii; micturition every fifteen minutes at night.	Cystitis developed seven days after operation.
57	77	May 14, 1895, Lerings.	Catheter-life eighteen years; then impossible, and artificial suprapubic urethra; fair condition after this for three or four years; cystitis then grew worse, and prostate growing steadily.	Thirty-six days after operation passed urine by urethra for first time in eighteen years.
58	73	September 11, 1894, James Swain.	Prostate hard. size of an orange; urine decomposing and contained much blood; kidneys presumably normal.	Seventh day passed small amount of urine normally, this increased till at end of three weeks; passes all urine voluntarily.
59	.	June 21, 1895, Böckman.	Entirely dependent on use of catheter for over a year.	Able to pass urine voluntarily same night, and no occasion to use catheter since.

REDUCTION OF ENLARGED PROSTATE.—*Continued.*

Post-Operative Mania.	Final Effect of Operation on Prostate, mentioning Time when Change made Itself Observed.	Subsequent History of Patient.
. . . . .	One month later urgency and pain less; health better; frequently slept two hours; neck of bladder less sensitive; ordinary metal catheter passes easily.	
. . . . .	One month later voids urine like a boy.	
. . . . .	Passes urine naturally.	
Slight talkativeness.	End of ten weeks still used catheter two or three times daily, though some urine passed without it; general condition improving.	
. . . . .	January, 1896, no pain on micturition; no need of catheter; general condition good; palpable diminution in size of prostate; urine nearly normal.	
. . . . .	January, 1895, micturition twice at night; prostate considerably smaller, but still enlarged; 400 grammes of residual urine.	May, 1896. Is still alive and in perfect condition.
. . . . .	Six weeks later prostate had decreased in size one-half; cystitis relieved; no residual.	May, 1896. Patient considers himself cured.
. . . . .	Trouble began again; no sepsis.	Died; no autopsy.
. . . . .	March 17, 1896, no suffering, never felt better; about ℥ iv of residual; urine normal in color, odor, and quantity.	
Unconscious on eighth day.	Prostate had begun to shrink in size when he died on fourteenth day.	
. . . . .	Before August 17 prostate decreased about one-half in size; cystitis better, and severe pain gone.	May, 1896. Improvement satisfactory.
. . . . .	End of fifth week prostate soft and size of horse-chestnut; urine normal.	December 11. Thirteen weeks after operation, prostate rather smaller and firmer than at last examination; free from any difficulty in emptying bladder.
. . . . .	No observations after three days.	

TABLE OF CASES OF CASTRATION FOR THE

No.	Age.	Date of Operation.	Condition of Prostate, Bladder, and Kidneys as far as Ascertained.	Immediate Effect.
60	79	November 30, 1895, Ricketts.	One week before operation passed water on an average of twenty-two minutes; passed ℥ii of pus daily.	. . . . .
61	.	Lillienthal, operator; Gerster, the reporter.	Enormously enlarged middle lobe; man in constant agony.	In two weeks catheter unnecessary.
62	.	April, 1895, Lillienthal, operator, and Gerster, reporter.	Suffered fourteen years; suprapubic cystotomy done years before; unable for many years to pass urine himself.	In four weeks able to hold ℥ii to ℥iii, and pass it himself.
63	.	Parker.	Prostate moderately enlarged; retention for ten days; both testicles cystic.	. . . . .
64	73	June 13, 1895, Wetherell.	Enormous prostate; able to pass ℥iii in twenty-four hours, and drew ℥lx by catheter; both testes cystic, and double hydrocele.	Thirty-six hours after operation passed ℥xii.
65	77	February, 1895, Munn.	Symptoms for five years; perineal prostatectomy in November, 1894; after six months' systematic catheterization slight and temporary relief; in three months cystitis and difficulty of micturition severe as ever.	Catheterization necessary for two months.
66	D.	Hodenpyl.	Suffered intensely from obstruction of bladder, due to enormous hypertrophy of prostate.	Shrinkage of prostate to restoration of voluntary micturition.
67	82	April 18, 1895, Kendall.	Six years confined to house; almost incessant use of catheter; retention; cystitis; prostate large; urine viscid and ropy; general health poor.	Immediate relief; retained urine four hours and passed it without pain; one or two attacks of cystitis recurred.
68	70	October 12, 1895, Meyer.	Immensely enlarged hard prostate; chronic purulent cystitis; micturition difficult; retention; cystic and degenerated testes removed.	Catheter omitted after twelve days, when shrinkage of prostate easily recognized.
69	66	November 13, 1895, McConkey.	Frequent micturition growing worse, and accompanied by desire to defecate; complete retention since July, 1895; prostate hard and sensitive, enlarged; emaciation, anorexia, fever, sciatic pain.	Night after operation catheter only three times, instead of eight to ten; passed water ninth day without pain.
70	76 D.	May, 1895, Post.	Catheterized five times a day by attendant; micturition impossible; great pain and discomfort; urine purulent; poor mental condition.	Three weeks after operation could pass urine up to ℥v; pus still in urine; great shock.
71 to 79	.	Orvill Horwitz.	. . . . .	. . . . .
80	.	Horwitz.	. . . . .	. . . . .
81	60	October, 1895, John W. Perkins.	Very large prostate; retention and incontinence; frequency of micturition; residual urine and cystitis; micturition painful, and no straining.	Completely relieved for two weeks.

REDUCTION OF ENLARGED PROSTATE.—*Continued.*

Post-Operative Mania.	Final Effect of Operation on Prostate, mentioning Time when Change made Itself Observed.	Subsequent History of Patient.
. . . . .	One month later pus had disappeared; micturition about once every hour; general health better.	
. . . . .	May, 1895, perfectly able to attend to business.	
. . . . .	. . . . .	
. . . . .	Good result.	
. . . . .	Twelfth day passed ℥x freely without pain; practically no residual urine.	
Shock pronounced; acute melancholia for sixty days.	Marked improvement, with regained mental control; complete control of bladder in four months; prostate one-third previous size at end of four months; micturition once or twice in night.	
. . . . .	Death; perforation of bladder had occurred behind and a little above prostate; general suppurative peritonitis.	
Acute attack of hysteria.	July, 1895, "prostate diminished considerably in size;" is well as thirty years before.	
. . . . .	Five weeks after operation shrunk to two-thirds or one-half former size; can hold urine five to six hours; better than for fifty years.	
. . . . .	May, 1896, has not used catheter since January 11, 1896; is improved in general health.	
. . . . .	No diminution in size.	Died in July, 1895.
. . . . .	In nine cases there has been a return to local conditions not very far from normal.	
. . . . .	In this case cystitis still persists in spite of every method of treatment.	
. . . . .	Prostate greatly reduced in size, but in many respects patient is as bad as ever; urinary symptoms still persist.	

TABLE OF CASES OF CASTRATION FOR THE

No.	Age.	Date of Operation.	Condition of Prostate, Bladder, and Kidneys as far as Ascertained.	Immediate Effect.
82	73	November, 1895, A. H. Lerings.	Enlarged prostate; cystitis; large amount of residual urine, loaded with pus; almost daily irrigation of bladder for one year and a half.	. . . . .
83	65 D.	June 10, 1895, A. Vanderveer.	Greatly enlarged prostate; chronic cystitis; evidence of pyelitis.	*Nil.*
84	65 D.	January 23, 1896, A. Vanderveer.	Greatly enlarged prostate; chronic cystitis; evidence of pyelitis.	*Nil.*
85	85	July 14, 1895, Roosing.	Frequent and difficult micturition for fifteen years; retention eleven years ago; catheter-life; prostate large; constipation, sleeplessness, anorexia, increasing amount of pus in urine.	Twelve days prostate one-fifth smaller; in six weeks passed urine spontaneously, thirty to sixty cubic centimetres; prostate reduced one-half; catheter at night.
86	63	October 10, 1894, Lüdkens.	Could not pass urine spontaneously for several years; catheter-life; catheterization difficult and painful; prostate large.	Ten days showed positive decrease in size of left half of prostate. In twenty-seven days left half not to be felt; right lobe still size of walnut; catheter omitted in fifteen days.
87	74 D.	November 16, 1894, Griffiths.	Prostate much enlarged; both testes functionally active and of normal size; catheter-life; micturition frequent, and very painful chronic cystitis.	At end of first week could pass urine without catheter; second week able to empty bladder fairly well; general condition better.
88	.	F. Smith mentions case.	Extreme prostatic obstruction and bad cystitis.	. . . . .
89	65 D.	January 9, 1895, Walker.	Prostate enlarged; retention for two weeks, requiring catheterization two or three times a day; incontinence for two years; urine purulent; patient in peculiar mental state for a long time.	Constant dribbling of urine.
90	61	May 18, 1895, Poulton.	Frequency of micturition with nocturnal incontinence; retention; catheter necessary very frequently after retention till operation; no cystitis.	Eight days later passed urine voluntarily; prostate smaller and softer.
91	60	May 13, 1895, Poulton.	Acute retention six weeks before; prostate size of walnut; catheterized regularly.	Fifteen days later passed urine; in five weeks residuum is ℥iv.

REDUCTION OF ENLARGED PROSTATE.—*Continued.*

Post-Operative Mania.	Final Effect of Operation on Prostate, mentioning Time when Change made Itself Observed.	Subsequent History of Patient.
. . . . .	. . . . .	Now, six months after operation, not more than a drachm of quite clear residual urine, and the bladder has not been irrigated for more than a month; patient well satisfied with the result of operation.
Post-operative mania within three days, and continued more or less until death.	Wounds did well, but patient died June 20, 1895; no autopsy allowed.	
Acute mania, February 28.	Death March 6, 1896; no trouble with wounds; no autopsy allowed.	
. . . . .	September 28, can pass urine at night; went without catheter for two days. October 19, catheter once a day; contractility of bladder regained; general health better.	
. . . . .	March 4, 1895, all signs of prostatic hypertrophy had disappeared; entirely well.	
End of second week sleeplessness followed by delirium.	Eighteen days after operation prostate still large; died on eighteenth day of gangrene of right leg from blocking of popliteal.	Autopsy showed chronic hydronephrosis of right kidney and suppuration of distended pelvis.
. . . . .	Fifteen weeks later urination normal; cystitis cured; gained forty-five pounds in weight.	
Mental state grew steadily worse; muttering and unconscious of surroundings; sleeplessness; maniacal outbreaks lasting ten to fifteen minutes.	Seventeen days after operation died, having developed Cheyne-Stokes respiration; low muttering delirium, with maniacal outbreaks until death; no autopsy.	
. . . . .	Two months later residual urine is ℥iv; three months later condition still improving.	
. . . . .	Three months later residual urine sixty-one and a half ounces; prostate diminished in size.	

TABLE OF CASES OF CASTRATION FOR THE

No.	Age.	Date of Operation.	Condition of Prostate, Bladder, and Kidneys as far as Ascertained.	Immediate Effect.
92	69 (?)	May 13, 1895, W. F. Fluhrer.	Prostate enormous; chronic interstitial nephritis; suprapubic cystotomy; September 9, 1894, attempted suicide because of his symptoms.	Sedative.
93	70 (?)	February 22, 1896, W. F. Fluhrer.	Prostate hard and very large; retention; catheter-life for fifteen years.	Much relieved.
94	64	April 28, 1895, reported by J. P. Bryson,	Marked bilateral and median hypertrophy; dependent on catheter; moderate cystitis; kidneys sound.	Some improvement third day; marked improvement in symptoms for six months.
95	67	May 24, 1895, reported by J. P. Bryson	Bilateral and median hypertrophy; cystitis; slight pyelonephritis.	Nocturnal frequency diminished in fifteen days.
96	72	July 27, 1895, reported by J. P. Bryson,	Extensive bilateral hypertrophy; cystitis and pyelonephritis.	None perceptible.
97	72 D.	September 19, 1895, reported by J. P. Bryson.	A marked case of advanced prostatism with beginning uræmia.	None.
98	67	May 6, 1896, A. T. Cabot.	Prostate size of lemon, hard and slightly uneven; bladder distended; residual urine ℥xiv; only slight trace of blood with round cells; urinates every half hour, and very painful; mental condition feeble.	. . . . .
99	.	July 4, 1895, King, operator.	Section of two and a half inches of each vas removed in September 3, 1894; following this unsatisfactory improvement for six or eight weeks; then pain in one testicle and over pubes; frequency of micturition increased; both vasa united; left testicle well formed; right somewhat atrophied; castrated July 4.	Two days after castration held urine for nine hours without distress; had not done so for years.

REDUCTION OF ENLARGED PROSTATE.—*Concluded.*

Post-Operative Mania.	Final Effect of Operation on Prostate, mentioning Time when Change made Itself Observed.	Subsequent History of Patient.
. . . . .	Change very gradual; now, May, 1896, prostate still large (has atrophied fully three-quarters), but urinates.	Suffers very little from urinary trouble after having passed a calculus *per urethram* two months ago.
. . . . .	May, 1896, prostate much smaller, but cannot urinate.	
. . . . .	None.	January 20, 1896. Complete retention after exposure; prostatectomy done May 2, 1896, completely dependent on catheter after January 20.
. . . . .	One month later ℥viii residual urine.	Lost sight of; did not reply to three letters.
. . . . .	None. March, 1896, condition reported to be the same.	
. . . . .	None.	Uræmic sopor quickly deepened into coma; death fourth day.
Delirious and unable to control himself, particularly at time of desire for micturition; escaped from ward during night (May 6); drank specimen of urine at bedside (May 7).	May 19, 1896. Prostate one-half diminished in size and softer, particularly in spots, giving uneven feel; residual still more than ℥x; urination every hour, with much less pain.	One month later the patient was much improved with only ℥ii to iii residual urine.

TABLE OF CASES OF LIGATURE

No.	Age.	Date of Operation.	Condition of Prostate, Bladder, and Kidneys as far as Ascertained.	Immediate Effect.
1	65	King, December 7, 1895. Excision two and a half inches each vas.	Prostate very hard; middle lobe most enlarged; patient in great distress.	Great relief within five days.
2	70	July 11, 1895, F. T. Brown, Double ligature both vasa.	Wholly dependent on catheter; absolute retention for three weeks.	Seventh day passed a little urine voluntarily; later patient had sensation of burning and itching in feet and legs, especially at night.
3	64	Chabot, February 28, 1895. Resection one centimetre of each vas.	Frequent micturition; occasionally urine blood-stained at end of micturition; prostate enlarged uniformly.	Two months later micturition nearly normal; prostate decreased one-half in size; testes smaller; general condition better.
4	64	March, 1896, Finney; divid'd cords	Prostate enlarged; suffered five years with frequent and difficult micturition; catheter-life; urine foul with much pus.	Improvement began about sixth day and has continued.
5	72	Isnardi, June 19, 1895.	Enlarged prostate; symptoms not yielding to treatment; urine purulent and blood-stained.	Twelve days later symptoms improved and in a month disappeared.
6	58	February 11, 1896, H. J. Schiff; ligature and excision, one inch of each vas.	Enlarged prostate; slight cystitis; urination very frequent and uses catheter.	Instead of urinating every half hour was able to retain it for from three to four hours.
7	67	April 4, 1896, H. J. Schiff; ligature and excision one inch of each vas.	Enlarged prostate; cystitis; catheter once a day; complains of desire to urinate at all times.	Has not desired to urinate so frequently.
8	70	Legueu, operator. Operation August 9, '95; section both vasa. Guyon, Congrès, Français de Chirurgie, October 21, 1895.	Complete retention for a month; prostate quite firm, of moderate size; on left a considerable subacute epididymitis.	One month later no change except disappearance of swelling in epididymis.

OF THE VAS DEFERENS.

Post-Operative Mania.	Final Effect of Operation on Prostate, mentioning Time when Change made Itself Observed.	Subsequent History of Patient.
. . . . .	Effort formerly required to start stream is now absent.	
. . . . .	Prostate diminished in size one month after operation; passed urine with comfort and ease, and never showed more than three ounces of residuum; returned to work, a cab-driver.	May, 1896. Functional improvement; almost a restoration, and has remained unchanged for eight months.
. . . . .	July, 1895. Frequent and complete erections and indulged in sexual intercourse; general condition excellent; urine passed freely and easily.	
. . . . .	May, 1896. Can now hold water about three hours; urinates normally without pain; feels better than for many years and can attend regularly to business.	
. . . . .	Six weeks after operation urine clear; can hold water seven hours and pass it without pain; testes diminished; prostate impalpable.	
. . . . .	March 11, 1896. Has not used catheter since operation; gets up at night about twice to pass urine, where formerly it was five or six times.	April 29, 1896. Complains again of frequent urination.
. . . . .	April 29, 1896. Shows no marked change as yet, and urination is about the same.	
. . . . .	October 14, 1895. Prostate unchanged; residual urine 250 cubic centimetres; is only passing catheter once in ten days.	

TABLE OF CASES OF LIGATURE

No.	Age.	Date of Operation.	Condition of Prostate, Bladder, and Kidneys as far as Ascertained.	Immediate Effect.
9	70	Guyon, ibid.; double section of vasa on June 11, 1895.	For more than ten years complete retention of urine; at time of operation catheter had to be used constantly; orchitis due to catheterization; passage of sound caused bleeding from prostate, which rectal examination showed very large and soft; right lobe especially large.	In a few days micturition less frequent, and catheter easily passed; after six weeks catheterized only every three or four hours.
10	70	Guyon, ibid.; section of both vasa in June, 1895.	Complete retention for several years; for six months catheterization had to be more frequent and was more difficult, though no bleeding; prostate very large and everywhere equally hard.	At end of a few days catheterized only every five or seven hours; no change in size or consistency of prostate.
11	70	Isnardi; ligature of vasa.	Complete retention for five years; cystitis for three months, requiring catheter every half hour.	Left bed three days after operation.
12	82 D. ?	Isnardi; ligature of vasa.	Large hydrocele and prostatic enlargement on left side; trickling of urine for two years.	Day after operation diurnal incontinence disappeared.
13	82 D.	Isnardi; ligature of vasa.	Dysuria many years; retention for five months; bladder greatly distended; urine alkaline; prostate enlarged on right side; for a month had used catheter twice a day with difficulty, often followed by bleeding.	Catheterization much easier on day after operation; second day voluntarily emptied bladder several times.
14	68 D.	Isnardi, Therap. Woch., No. 21, 1896; also published in Therap. Gazette, April 15, 1896. June 25, 1895; bilateral ligature and division of vasa.	Testicles of normal size; prostate size of small apple; bladder distended; dysuria three years; incontinence long time.	Six days after operation trickling ceased; voluntary micturition every hour; distention gone; two weeks later could hold water four hours; prostate markedly atrophied.
15	71	Isnardi; ligature of vasa.	Dysuria eight years; straining and passing a few drops every half hour; bladder could not be emptied; septic fever for some days; urine acid, and not markedly altered; false passages in urethra.	Nine days after operation could urinate spontaneously; residual urine diminished by three-fourths; fever gone; catheter no longer needed.
16	69 D. (?)	Isnardi; right vas dividedand ligated.	Symptoms of prostatic hypertrophy for several years; retention for four days, not relievable by catheter, resulting in coma; left varicocele; right hydrocele; prostate hypertrophied on right, atrophic on left, though left testicle was enlarged.	A week later catheter passed readily.

OF THE VAS DEFERENS.—*Continued.*

Post-Operative Mania.	Final Effect of Operation on Prostate, mentioning Time when Change made Itself Observed.	Subsequent History of Patient.
. . . . .	At end of six weeks great diminution of engorgement of prostate; right lobe considerably diminished; testes unchanged; did not recover power of voluntary micturition.	
. . . . .	After two months still no change in prostate, and no recovery of voluntary micturition; testicles remained normal.	
. . . . .	No change in symptoms a month after operation; six weeks after operation cystitis was cured; used catheter every three hours; no restoration of function.	
. . . . .	Last week of life had nocturnal and diurnal incontinence.	Died of apoplexy in a month.
. . . . .	Prostate at death size of hen's egg, and soft testicle of gray color.	Eleven days after operation died of senile marasmus.
. . . . .		
	At death both testicles atrophic; prostate small, especially on left; bladder trabeculated and showed signs of earlier submucous bleeding.	Died September 17, of marasmus.
. . . . .	Passed urine three to four times a day normally.	
. . . . .	. . . . .	Twenty-three days later died of apoplexy; no autopsy.

TABLES OF CASES OF LIGATURE

No.	Age.	Date of Operation.	Condition of Prostate, Bladder, and Kidneys as far as Ascertained.	Immediate Effect.
17	55 D. (?)	Isnardi; ligature of vasa.	Dysuria two years; had been twice operated for hæmorrhoids, and suddenly lost after the last operation power of evacuating bladder afterwards having to use catheter; a cystitis had been cured by nitrate of silver; violent and obstinate tenesmus; contemplated suicide.	Four days after operation passed better stream than for years; pain not relieved; he was compelled to use catheter.
18	80	Isnardi; ligature of vasa.	Dysuria several years, often complicated by complete retention; used catheter all this time, often with difficulty; attacks of bleeding and fever being not uncommon.	Day after operation catheter discarded, and all symptoms disappeared; able to hold water three hours, but suffered from repeated and harassing tenesmus.
19	64 D.	Isnardi; ligature of vasa.	Serious disease of heart and kidneys; some years of prostatic hypertrophy; retention for fourteen days; catheterization very difficult and caused bleeding; false passage and suppurative cystitis; prostate size of hen's egg; cystitis grew worse, with permanent catheterization.	On day of operation micturition possible but difficult; next day acid urine free from pus passed.
20	70	Isnardi; ligature of vasa.	Retention for a month; catheterized two or three times a day without improvement; urine contained pus; testicles and prostate small.	Two days after operation passed water twice; next five days micturition frequent and catheter discarded.
21	65	Isnardi; ligature of vasa.	Prostatic obstruction many years; some months tenesmus recurring every quarter hour, day and night; prostate and testicles of medium size.	Day after operation micturition easier and less frequent; tenesmus completely gone, and general condition improved.
22	76 D.	Isnardi; ligature of vasa.	Prostatic hypertrophy for several years, frequently using catheter, thus causing epididymitis; urine ammoniacal; catheterization very painful and difficult; vesical spasms day and night.	Day of operation passed large amount of urine; pain disappeared immediately; thirty hours after operation urine acid and very little pus; next day more pus.

OF THE VAS DEFERENS.—*Concluded.*

Post-Operative Mania.	Final Effect of Operation on Prostate, mentioning Time when Change made Itself Observed.	Subsequent History of Patient.
. . . . .	. . . . .	Became hopeless and committed suicide
. . . . .	Able to empty bladder with only slight burning; hopes for improvement with time.	
. . . . .	At death could urinate spontaneously.	Five days later died of visceral troubles.
. . . . .	Micturition sometimes frequent though usually normal.	
. . . . .	In two weeks urine absolutely normal.	
. . . . .	Passed some urine spontaneously, but had to depend mostly on catheter after second day.	Hippuria, a sequel to nephritis, which proved fatal in two weeks after operation.

CASES OF CASTRATION

No.	Age.	Date of Operation.	Condition of Prostate, Bladder, and Kidneys as far as Ascertained.	Immediate Effect.
1	75	December 26, 1895, W. S. Forbes, Philadelphia.	Enlarged prostate; bladder trouble for many years; complete retention at times; hæmorrhage in passing catheter; stone removed twice previous to castration.	Seventh day prostate had shrunken, but was still one-third larger than normal, but was soft.
2	75 D.	January 2, 1895, A. T. Cabot.	Cystitis and stone. Litholapaxy and castration.	. . . . .
3	71 D.	February, 1895, R. Park.	Condition execrable; largest prostate I ever felt.	. . . . .
4	71 D.	March, 1895, R. Park.	Vesical calculus; enormous prostate.	. . . . .
5	64 D.	November 20, 1894, Mansell-Moullin.	Very stout man; prostate of great size; cystitis; hæmaturia; unable to pass urine; catheterized with great pain every hour, day and night; bladder fair size and good muscular tone.	In a week passed a small amount of urine naturally for first time in fifteen months; eighth day hæmaturia and dyspnœa.
6	66	July 15, 1895, S. C. Gordon.	Constant use of catheter at time of operation; could use No. 6 soft; prostate very large.	. . . . .

COMPLICATED BY STONE.

Post-Operative Mania.	Final Effect of Operation on Prostate, mentioning Time when Change made Itself Observed.	Subsequent History of Patient.
Recovery much retarded by an attack of acute insanity, but slight febrile movement, and temperature at no time above 101° F.	January 3. Operation for stone, and the bladder completely freed from all fragments of stone; after this the patient was free from his distressing symptoms excepting there was and is still total retention; before operation great difficulty in introducing 9 linen catheter; now passes with ease 17, American scale, soft rubber catheter.	He is now able to go about his work and is more comfortable than for years, having to draw his water at intervals of from three to seven hours; otherwise his health is excellent.
Serious mania; testiculin injected with relief.	Discharged, much relieved, March 30, 1895.	Death reported May 31, 1896.
. . . . .	Suprapubic cystotomy and orchidectomy.	Death ninth day from exhaustion.
. . . . .	Suprapubic lithotomy and orchidectomy.	Death next day from exhaustion.
. . . . .	Distinct evidence of reduction in size of gland and of a reopening of prostatic urethra.	Tenth day dyspnœa and hæmaturia returned; death on eleventh day; fatty heart, emphysemic lungs; stone back of prostate; bladder wall ulcerated.
. . . . .	August 6. Found stone; suprapubic operation, and found prostate almost entirely absorbed; discharged, October 22, with almost normal bladder. March, 1896. Now a very active business man.	This patient was seen by Dr. Cabot on June 19, 1896. He then had a very large prostate; prostatic urethra long, resistant. Dependent upon catheter entirely, and was obliged to use it every hour; he had a stone in the bladder.