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A COMPARISON OF THE MERITS OF SUPRAPUBIC AND PERINEAL CYSTOTOMY.

BY NATHANIEL PENDLETON DANDRIDGE, M.D.,

OF CINCINNATI,

PROFESSOR OF SURGERY IN THE MIAMI MEDICAL COLLEGE.

I SHALL endeavor in the following paper to estimate the relative advantages of the suprapubic and perineal routes in the various conditions for which the bladder must be opened, and seek to determine whether the now fashionable high operation has not made us over-estimate the value of the former, and led us to under-estimate the advantages of the latter.

The great expansion of the surgery of the urinary apparatus in man is not the least interesting of the advances made during the present generation, and the wider field now offered for interference has naturally brought to the front new methods and led to the expansion of older ones to meet the requirements of our bolder attitude in approaching the relief of these affections. It may be well to recall at the outset—though the history is so recent that it is well known—the conditions which have led to the present prominence of the suprapubic operation.

The publication of the anatomical studies of Garson, in 1878, showing the relation which exists between that portion of the anterior wall of the distended bladder uncovered by peritoneum and the abdominal wall,—when at the same time

the rectum is distended,—and the paper of Petersen, in 1880, showing the application of these facts to suprapubic cystotomy, are the well-defined dates for the new departure in bladder surgery. The recent expansion of peritoneal surgery in which the abdominal wall had been so freely and safely incised, and which had shown how fully the dangers from peritonitis could be discounted, undoubtedly had a determining effect in influencing the immediate general adoption of the high operation. The facility with which the operation could be performed, and the satisfactory access which it gave to the bladder, to both sight and touch,—and the marked extension which it afforded to manipulations within its cavity, all gave a decided impulse to its popularity, and its adoption at once widened out the field of operative activity in vesical surgery.

The natural limitations of perineal cystotomy, the imperfect manner in which it afforded an opportunity for exploring the bladder, and the restricted limits which it placed upon manipulation for the removal of foreign bodies, or morbid growths, were all additional arguments for the adoption of another method and another route by which the much-desired freer access to this region could be obtained.

Cystotomy up to the time of Petersen's paper had been confined to the extraction of stone, the occasional removal of an outgrowth from prostate and base of bladder, or for puncture for retention, and the new method at once afforded an opportunity for expansion in operative interference,—an opportunity which operators were not slow to improve,—and it was natural and proper, indeed it was inevitable, that it should be pushed to its utmost limits.

Tumors were at once removed, and the prostate was attacked in a manner unheard of before, and at the same time it was applied by many in place of the better known forms of perineal lithotomy for the removal of stones,—large and small, and in young and old alike, and became a favorite method of dealing with obstruction, needing temporary or permanent drainage.

The history of suprapubic cystotomy is of interest, showing as it does such a varying degree of popularity, from time to time, since its introduction by Franco, in 1556. It has been taken up and its advantages advocated by individual surgeons, without, however, securing any general adoption until the present. Cheselden practised it with success for a time, and then, without any definite reason being assigned, turned to lateral lithotomy, which he continued to employ until his death.

During the early part of this century the high operation for stone had strong advocates in France,—Dupuytren, Scarpa, and Soubierbeille being among those who championed its cause,—and proclaimed its merits, without, however, commanding a general following in their own or foreign countries, though here and there it was adopted in isolated cases of very large stones, or for the removal of foreign bodies.

It is of interest in this connection to recall the paper of Dr. Dulles, in 1875, setting forth the advantages of the high operation from the analysis of nearly 500 cases collected from various records. A comparison of the perineal and suprapubic routes to the bladder reveal dangers and difficulties in both, though in both it may be said that they are the exception. In both the condition of the kidneys dominates and controls largely the mortality, and determines the degree and intensity of operative shock. Hæmorrhage may be encountered in both, but is seldom serious or difficult to control in either.

The possible injury and occlusion of the ejaculatory ducts and the wounding of the rectum are peculiar to the perineal operations. The published facts bearing on the first subject are, however, extremely limited in number, while wounding of the rectum rarely occurs, and when it does occur is seldom of serious import.

On the other hand, the much-feared danger of infiltration of urine after opening the prevesical space in the suprapubic operation can be safely ignored, and the danger of peritonitis, while by no means absent, can usually be provided against even when the cavity is opened by accident, or intentionally.

It may be said that there is now among surgeons a practical unanimity as to the best method of performing both median and lateral perineal cystotomy, and that there is no further room for discussion on this score. On the other hand, the best method of performing the high operation is still the subject of animated discussion, and new suggestions are constantly being made for the improvement of the technique of every step.

The usual median incision of the abdominal wall and bladder has been supplemented by the transverse incision of one or both of these structures. The distention of the rectum by the rubber bag, considered essential by Petersen and his followers, has been discarded by many as dangerous on account of rupture, and the Trendelenburg position adopted as safer and as answering in every way the same purpose.

The distention of the bladder by water, it is now claimed, is less effective and more dangerous than air distention, which is strongly advocated as the better and safer.

The relative merits of leaving open, or sewing up, the wound in the vesical wall is still undetermined, and both methods have their advocates.

The best manner of draining the bladder is still discussed, and new suggestions are constantly being offered,—whether drainage should take place simply by overflow, by single or double tube, or by a system of siphonage, constant or intermittent. In no step of the entire operation has any single method met with general concurrence and approval, and in every one there is at least one alternative. This in itself is an indication that each of the various methods and modifications leave something to be desired, and is a curious if not a more significant fact in connection with an operation so often performed in the last twenty years as suprapubic cystotomy

Of the two operations, unexpected difficulties may, I think, be said to be more likely to occur in the suprapubic than in the perineal operation, and statistics I consider certainly prove that the high operation is the more fatal in conditions of like gravity and severity. In successful cases the

wound is longer in healing. The patient requires more care and attention, and a permanent fistula is more likely to occur, and even when healing has once taken place a breaking out again occurs more often than in the perineal operation.

Furthermore, the fixation of the bladder to the abdominal wall is likely to impair the natural concentric contraction of the vesical wall upon the urethral outlet as a centre which is so important to the complete evacuation in the normal bladder. It is this imperfect concentric contraction which is to be charged with the recurrence of residual urine, and cystitis when the natural channel resumes its functions after suprapubic cystotomy. The perineal opening is free from this objection.

As Diday says of his own case, in another sense, however, " Dieu fit bien ce qu'il fit."

Nature intended that the urine should escape beneath the pubis in man, and demands a serious price when it becomes necessary to ignore this law.

Auneau has studied in an interesting thesis the immediate and later results of the suprapubic opening. The immediate effect upon the bladder he finds most satisfactory. The purulent urine becomes clear, and the mucous membrane returns to its normal condition. To quote the words of Poncet, the bladder of an old man resumes the condition of youth. The artificial channel, however, preserves the conditions of a fistula, and in no way assumes the function of a urethra. It may be guarded to some extent by the voluntary muscles through which it passes, but the sphincter action of the vesical involuntary muscles which has been claimed is entirely wanting, and this irrespective of the various modifications which have been suggested. The surgeon is not master of the function of the channel he has created. Incontinence is the rule with continuous escape of urine, or possibly the intermittent escape by catheter, or overflow, after a small amount has collected in the bladder. Voluntary control and micturition are the great exception. Continence after suprapubic cystotomy, he says, in the experience of Paris surgeons still remains a

myth, and the continuous flow of urine which at first was the patient's salvation soon becomes the source of the greatest distress.

Drainage is an important factor in nearly all operations upon the bladder. It is indicated for the relief or prevention of cystitis, or to substitute an artificial outlet for the natural channel, which may have become more or less completely, and either temporarily or permanently obstructed, and in cases in which the use of the catheter has become painful and difficult. Cystitis following obstruction is the condition most frequently demanding drainage. "As predisposing causes of cystitis we recognize," to quote from Senn, " such injurious agencies and influences as are concerned in establishing a *locus minoris resistentiæ* in the tissues of the bladder, in which a sufficient number of pathogenic microbes of adequate violence accumulate to produce those tissue-changes which characterize inflammation."

Cystitis is always due to the presence of infecting germs. Micro-organisms may be carried to the bladder by illy cleaned instruments, which may also be the cause of the no less necessary traumatism, or they may gain entrance by the simple extension of a disease process along the natural channels, the urethra being more often responsible than the ureter. The passage of germs by the lymph-channels must also be recognized as a not infrequent cause of infection from adjacent lesions. " The ordinary pyogenic organisms are only capable of producing cystitis in the presence of favorable conditions; certain organisms, however, that possess the power of breaking up urea and extremely virulent cultures of the bacillus coli are exceptions. These need no accessory or predisposing cause. The urobacillus liquefaciens septicus and the staphylococcus pyogenes are two of these."

" Everything that interferes with the circulation through the bladder, or the prostatic portion of the urethra, favors the occurrence of cystitis." (Moullin.)

This explains its frequent occurrence in stricture, and hypertrophy of prostate with its residual urine, and passive

congestion of the vesical mucous membrane. Retention alone will not cause it, even when a large amount of residual urine is habitually retained, but furnishes a soil most favorable for the growth of micro-organisms even when present to a slight degree. Stone will not cause it alone, but the irritation and local traumatism which follow its presence are powerful adjuncts to the action of living organisms.

"In suppurative cystitis the bladder contains myriads of septic organisms which grow and thrive in the urine and pour their poisonous products into it. If the attack lasts for any length of time, or if the micro-organisms are assisted by the presence of some additional irritant, such as a foreign body or a calculus, they spread through the protecting epithelial layer and involve the wall of the bladder, too." (Moullin.)

The cavity may be distended, the walls flaccid or thin, and perfectly tolerant of large quantities of urine, or the walls may be thickened, and contracted so that the bladder capacity may be reduced to one or two ounces, and intolerant of the smallest amount. The cavity may present a condition of sacculation, pouch-like dilatations extending out between the muscular bundles, quite incapable of emptying themselves. The deep pouch which forms behind the prostate, and below the urethral outlet, is well known.

The reaction of the urine has an important bearing on drainage. In ammoniacal urine the tenacious glairy deposit of pus with the incrustation of the mucous membrane with phosphatic salts presents a condition much more difficult of removal by drainage than acid urine with its lighter flocculent deposit.

Those bladders are most effectively drained in which the cavity retains its natural form and its walls are still able to expel its contents; while the bladders of irregular shape and thickened walls yield much less readily to its influence, and in such, complete restoration of function is less likely to follow. In these cases, however, drainage may establish a painless mode of exit, and by keeping the bladder empty remove the conditions favorable for germ action,—namely, conges-

tion of the mucous membrane, and the liberation of ammonia from decomposition of urea, and the power of contraction may again return to a bladder which had apparently lost it entirely. In many cases of cystitis the simple removal of the predisposing irritant, such as a stone, or of an obstruction, such as a stricture, may be all that is necessary to remove the morbid state due to infection. The bladder now contracts and expels the germ-laden urine, and the mucous membrane rapidly regains its normal condition. In more advanced cases the same result may be obtained by careful and frequent washing with disinfectants, so as to destroy and remove the morbid germs and their products. " When, however, one has exhausted the large resources of catheterism, when the bladder becomes intolerant, when in spite of injections clear urine is no longer obtained, when the patient begins to be infected, cystotomy finds its indication, and should prove a means of great benefit." (Routier.)

In cystitis following stricture even of high grade, perineal drainage following an external urethrotomy is so eminently successful that the advantage of a suprapubic opening, while it has been suggested, has never been seriously considered.

In hypertrophy of the prostate an opening into the bladder may be demanded for an acute retention which cannot be relieved by the catheter, or the use of the aspirator. It may be called for on account of frequent and painful catheterization, or to prevent or relieve a cystitis, either with or without symptoms of general infection. In these cases the perineal route offers certain definite advantages. It is the operation of least danger, most rapid and easiest of execution. The opening is best placed for drainage at the lowest part of the bladder, and it further, in many cases, affords an opportunity, without in any way increasing the danger, of securing a permanent relief by freely incising the obstructing part of the gland, and so cutting down the floor of the urethra to a level with the lowest part of the bladder, as first suggested by Harrison, and preventing recurrence by keeping a large-sized tube in place during the process of healing. These favorable

conditions can only be secured after a suprapubic cystotomy by an additional prostatectomy, which adds greatly to the severity of the operation. That drainage by a suprapubic opening is not satisfactory is shown by the fact that many operators supplement suprapubic prostatectomy by making a perineal opening just to secure a low-level drain. In this connection the names of Belfield, Keyes, and Cabot may be mentioned. It is of interest here to note the fact that Frere Come in performing suprapubic lithotomy began by a perineal incision through which he introduced the sonde-a-dard, and after completing the operation used the opening for the introduction of a drainage-tube. In acute retention, when repeated aspirations will not afford relief, the same reasoning would apply in giving the preference to the perineal operation.

I would, however, make an exception in favor of those cases of acute retention associated with a large hæmorrhage and coagulation of blood within the vesical cavity. Here, while the catheter may enter the bladder, it is immediately clogged with clot so that evacuation is impossible. In such cases the suprapubic opening affords decided advantages by getting rid, at once, of all the coagula. Here the pressing necessity outweighs the future advantage of the opening in the perineum. It must, however, be admitted that for purposes of exploration of the bladder cavity, the high operation possesses all the advantages, and for this purpose, with the admitted impossibility of always excluding such complications as stone or tumor, in advanced cystitis, it will at times be properly chosen, in order to place us in a position to at once deal with these conditions also if found to exist. Should, however, the case prove to be one for simple drainage, a perineal opening should at once be made in the majority of cases.

Of the relative advantages of a suprapubic or perineal opening in the bladder for permanent drainage, it is difficult to express a definite opinion, from a study of statistics or the expressions of authorities. Both routes have been used with advantage. Hunter McGuire and Poncet have been the chief

advocates for the first. McGuire especially has published an interesting series of cases in which voluntary control of the bladder existed with an opening above the pubis. I have not, however, been able to find the evidence that many others have been equally successful, and many who have tried it have expressed themselves illy satisfied with the result. When the patient is up and about, the opening will leak in the majority of cases, in spite of plugs and pads, and when necessary a rubber urinal is a veritable abomination. The perineal tube, on the other hand, is by no means easily borne; for, while it passes through the prostatic urethra, and is grasped by the muscles which close this channel, and so prevents leakage, it is apt to cause more or less pain and discomfort, both in sitting and walking. Should the time come, however, when the tube can be dispensed with, the comfort of the patient is much greater with the perineal opening, which soon becomes competent, except at the time of the voluntary evacuation of the bladder, while the suprapubic continues to leak, and be a source of annoyance until final closure, which is likely to be indefinitely delayed.

When the bladder must be open on account of obstructed or painful micturition in cases of cancer of the bladder, the high opening presents decided advantages. The growths are most often at the base of the bladder, and a perineal tube is likely to cause hæmorrhage, and the growth is likely to obstruct the opening into the bladder so that reintroduction of the tube becomes difficult. The high operation here presents decided advantage. In tuberculosis of the bladder general and hygienic measures should be given the preference to operative interference. Operation may be called for either to attempt direct treatment of the vesical lesion, or to secure relief from frequent and painful micturition. The suprapubic opening is here the better placed, and offers greater facility for inspection and treatment. I would draw, therefore, the following conclusions, that for the purpose of drainage perineal cystotomy presents advantages over the suprapubic:

(1) Because it drains more efficiently while the patient is in bed, and subjects him to less discomfort.

(2) The perineal wound heals more promptly and with less leakage than the suprapubic, if the tube can be withdrawn.

(3) It is less likely to offer difficulty, and its performance takes less time.

(4) It affords a better opportunity for permanently removing the cause of obstruction, and so securing a permanent relief without increasing in any way the danger.

(5) It is less likely to interfere with the restoration of normal contraction, and is in itself a less dangerous way of opening the bladder.

In cancer of the bladder, tuberculosis, and hæmorrhage, suprapubic cystotomy affords the greater advantage.

In discussing the relative merits of the high and perineal operations for stone, I may at the outset quote with entire approval the sentence with which Thompson opens his treatise on the suprapubic operation: "I think," he says, "that among experienced surgeons there will be little or no dissent from the proposition that the operation of lithotrity at a single sitting is, in fairly experienced hands, that which is best calculated to insure a successful result for nine cases out of ten of stone in the bladder occurring among male adults."

I would be understood, therefore, as considering that the operation of choice for the great majority of cases of stone in the bladder in adults is the crushing operation, and that no form of cutting operation can compare to it in safety and efficiency. Nor am I disposed to consider that organic disease of the kidneys, cystitis, or hypertrophy of the prostate, unless most marked, are to be considered in themselves a contraindication; while the experience of English surgeons in India has so far extended the age limit that children of all ages now may be said to come within its scope. Furthermore, the successful development of perineal lithotrity has so far extended the application of the crushing operation to stones of unusual size that it may be said that few calculi remain which must of necessity be subjected to a cutting operation. There still, however, exists a sufficient diversity of

opinion to furnish an ample opportunity for studying the results of the various forms of lithotomy.

Statistics all seem to prove that the high operation presents a much higher rate of mortality than the perineal, especially lateral lithotomy. This is much more marked in early life than in those over fifty. Barling has studied the results of stone operations in five years, from 1888 to 1892, in "six London and seven provincial hospitals, the majority being medical schools." One hundred and sixty-nine cases of suprapubic in all ages gave a mortality of twenty-six,—or 15.3 per cent.; while lateral lithotomy, with ninety-six cases, was fatal in five,—or less than 5 per cent.

In patients under twenty, the contrast is still more marked. In seventy-nine cases of suprapubic lithotomy, fifteen died,—or 19 per cent. Lateral lithotomy, in sixty-four cases, gave a mortality of 3 per cent.

It is of interest to note that the causes of death in the high operation were given as degeneration of kidneys, peritonitis, septicæmia, cellulitis, and secondary hæmorrhage.

Comparing the results for all cases of stone during these five years, including those submitted to lithotrity, with Thompson's well-known earlier tables, he finds that the latter give a mortality of 12.5 per cent., while the former only 10 per cent., showing a reduction of 2½ per cent., by which the general mortality of stone operations has been lowered in modern times. In children, however, the mortality has actually increased; Thompson showing a mortality of 6 per cent. and Barling's tables 8.4 per cent. This greater mortality is shown to be due to the suprapubic operation, as lithotrity in patients under twenty gave a mortality of only 2 per cent.

These statistics are said to include all of the cases of lithotomy in the above mentioned hospitals. Nearly two-thirds of the entire number were submitted to the high operation. This fact proves that the high mortality in modern cases is not due to the fact that only stones of unusual size were reserved for suprapubic lithotomy, as has so often been

claimed, for there is nothing to indicate that there was any difference in the cases submitted to the two forms of cutting operations. From these figures the conclusion seems inevitable that the high operation in average cases of stone in children furnishes a mortality vastly greater than the perineal operation.

The same relative mortality is further shown in the tables for suprapubic lithotomy given by Watson, in the "Text-Book of Genito-Urinary Surgery."

Two hundred and forty children give a mortality of 12 per cent.; twenty-seven adults give a mortality of 0 per cent.; nineteen old men give a mortality of 42.1 per cent.

The same author gives the mortality for perineal lithotomy as follows:

Three hundred and fifty-five children, a mortality of 3.1 per cent., as against 12 per cent.; seventy-nine adults, a mortality of 7.6 per cent., as against 0 per cent.; nineteen old men, a mortality of 15.7 per cent., as against 42.1 per cent.

The success in stone operations in the hands of the English surgeons in India is so extraordinary that it may be questioned whether their results are applicable to Europe and America.

The most recent statistics, said to be drawn from official sources, have been given by J. A. Cunningham (*British Medical Journal*, August 7, 1887):

Ten thousand and seventy-three cases of lithotrity, with a mortality of 3.96 per cent.; 7201 cases of lateral lithotomy, with a mortality of 11 per cent.; 147 cases of suprapubic, with a mortality of 42 per cent.

It is of interest to speculate on the causes of the unusual success in the crushing operation in India, so far is it beyond anything found elsewhere.

Freyer asserts that while the average is younger by some years than that given in Thompson's tables, the average size of the stones is larger. Personal dexterity, acquired by unusual experience, may play a certain *rôle*. It seems not unlikely that a part of this success may be due to the fact that

chloroform seems to be so much safer than in the more northern climates, and, further, to the fact that they are dealing with a population foreign to the use of all forms of alcohol, the habitual use of which is so potent an influence in producing those degenerative changes of the kidneys, and arterial system, which is so important a factor in the mortality rate of all forms of surgical interference with the urinary apparatus in man.

If we are to be guided by mortality tables it would seem to be probable that all forms of cutting operations will be still further restricted, and the cases for which the suprapubic operation is to be chosen should be extremely limited, and I should myself prefer the lateral operation for stones too hard to crush, except in case of very unusual size, from the larger mortality, the increased length of convalescence, the greater discomfort, and greater likelihood of a permanent fistula of the former method. I should myself consider that experience would indicate that the high operation should be confined to stones of most unusual size, to encysted stone, and to stones complicating tumors, and to cases of some deformity, such as ankylosis of the hip, and that hypertrophy of the prostate should only exceptionally demand it.

The operative procedures now offered for the relief of hypertrophy of the prostate present us with a veritable *embarras de choix*. It is not my purpose to discuss the merits of these various methods except so far as the perineal and suprapubic routes are concerned in prostatectomy.

It is essential, however, to refer to castration as a means of relief in these affections. The most recent statistics presented by the author of the operation are to be found in the "Text-Book of Genito-Urinary Diseases." Here are reported 107 recent cases not found in other reports. Of these twelve died,—a mortality of 11 per cent. Two of these deaths it is considered should not be counted, and this reduction would reduce the percentage to 8.5 per cent. The author says that in properly selected cases the death-rate should not be more than 5 per cent. Other authorities have estimated the mor-

tality, however, as high as 20 per cent. Cabot has calculated the percentage of cases decidedly improved as 80 per cent. of those surviving. The operation has been attended with such success that it has commended itself as the method of choice to many surgeons. There are many, however, whose experience would lead them to decidedly limit its application.

The recent reports of the Bottini operation would indicate that it is capable of dealing with a large proportion of cases of hypertrophy in a successful manner, even in the presence of desperate conditions.

In a recent report, by Meyer, in the *New York Medical Record*, 164 cases gave 75.5 per cent. as cured or much improved, with a total death-rate of 8 per cent., or of deaths due to the operation 5 per cent.

These results compare favorably with any of the operations recently advocated and now being tried, and a more extended employment will doubtless soon furnish us with the evidence to determine its advantages, and to fix its limitations.

It is not necessary to describe in detail the conditions of the prostate which cause changes in the bladder demanding relief. "It does not matter," says Moullin, "what part of the prostate is affected. It may be the median or the lateral lobes; it may be all three, or it may be the urethral portion only; wherever it occurs it obstructs the exit of the urine from the bladder and increases its work;" and, "every form interferes with the level of the floor of the bladder."

Operations are undertaken in hypertrophy either to remove the obstacle to urination, or to diminish the obstruction which exists to the introduction of the catheter (Vignard). Prostatectomy has now been submitted to trial by a large number of different surgeons, and the original operation has been variously modified to supply the deficiencies, and avoid the shortcomings of the method first suggested by Belfield and McGill. Its results have been greatly extolled, but a superficial knowledge only is needed of the cases reported to discover a decided want of unanimity in the expression of

approval and satisfaction. The relief has been far from complete, and the ultimate condition of the patient far from being all that is to be desired.

" So grave is it, and so far from being ideal in the results that it guarantees," says Keyes, " that we hear less of prostatectomy now than formerly. It is not now generally advocated by the Guyon school in France. The tendency there is to return to the catheter with asepsis."

It seems, however, in spite of such criticism, which is by no means isolated, that some form of prostatectomy is likely to remain as an acknowledged surgical procedure in dealing with the graver forms of hypertrophy that have passed beyond the power of the catheter to relieve.

A suprapubic opening has the advantage of giving a full view of obstructing bars, hypertrophied third lobes, and horse-collar overgrowths, and usually permits the removal of all parts presenting on the vesical side. By this means, partial or complete prostatectomy can be performed, though for the latter recent operators have found that they could derive great assistance by a perineal incision in addition.

Removal of a part or the whole of the gland by suprapubic prostatectomy is only effected by extensive laceration of the mucous membrane about the urethral opening, and by leaving exposed to the urine the cavity left by the tissue removed. It has the disadvantage of having the opening badly placed for drainage, and the hæmorrhage encountered has been severe and hard to control. So conspicuous have the defects been that it is now usual to supplement the suprapubic opening by a perineal incision. By this means hæmorrhage can be more easily controlled, and the necessary drainage more readily secured. It further greatly facilitates the removal of the gland by enabling the operator to push it more prominently into the vesical cavity, and so bring it within easy reach from above. This advantage is so decided that the opinion seems growing that partial removal—cutting away or gouging out presenting portions of the prostate—should only be attempted by the suprapubic opening alone.

In a considerable proportion of cases a fatal result has

ensued, and in no inconsiderable number the operation has failed entirely to secure a return of the power of emptying the bladder, while in others again this has been incomplete, with the evil consequences of residual urine and its resulting cystitis. Its mortality has recently been estimated by Cabot at 20 per cent., with marked relief of the symptoms of obstruction in 83 per cent. of those who survived, or 68.4 per cent. of those operated on,—a proportion less than reported as decidedly improved by the Bottini operation. A variety of perineal operations have been suggested for the complete removal of the prostate. Zuckerkandl, Dittel, Nicoll, and Alexander have all suggested different methods. Alexander's operation may be taken as likely to prove the most satisfactory of these. It may be characterized as a perineal operation with a complementary opening of the bladder above to facilitate the manipulation necessary for bringing the prostate within easy reach from below; just as the operation advocated by Belfield, Watson, and others, must be considered a suprapubic operation with the addition of a perineal opening for drainage, and to afford assistance in the removal of the gland from above.

In Alexander's operation the membranous urethra is alone opened, and the mucous membrane at the base of the bladder left entirely undisturbed, while the tube is best placed for drainage.

The opening above affords in addition every opportunity for exploring the bladder for stone or other complication. The results reported by the author indicate a satisfactory success. A sufficient number of cases by different surgeons have not yet been published to enable us to estimate its definite place in the relief of hypertrophy.

From the present trend of opinion it would seem not at all unlikely that, after all, the operation suggested years ago by Harrison may prove to be the most generally applicable for prostatic obstruction. It seems to have held its place in the estimation of surgeons in the face of the newer operations. It is little more than an external urethrotomy. The finger

carried through the prostatic urethra readily guides the knife to the obstructing mass in the middle, and the lobes on either side may be freely incised and a low level urethra secured, in the large majority of cases.

The perineal route would seem to possess certain decided advantages in cases of hypertrophy demanding operation. It affords the best drainage, it secures an easy introduction for the catheter, if further needed, even when it was most difficult before. It has the great advantage that it may be resorted to in extreme cases when drainage is urgently demanded, and is so rapidly completed that prolonged anæsthesia is avoided,—the greatest danger these cases have to encounter.

During the last twenty years the chapter on vesical tumors has been very fully elaborated. Their pathology and symptoms are now well known, and the data upon which their diagnosis can be made is generally recognized, so that it is unnecessary to dwell on this part of the subject. All forms of tumors are likely to be complicated by cystitis, either with or without stone, by which their recognition is often greatly obscured. Medical treatment and palliative injections are not likely to meet with much result.

Operation is indicated either for the removal of the growth or to provide a painless exit to the urine. Pain—and often of the most excruciating character—is one of the most constant symptoms, and obstruction, more or less complete, frequent when the growth is near the orifice of the urethra. Hæmorrhage may threaten life and demand operation for its control.

Perineal cystotomy has had some notable triumphs in dealing with tumors that were situated near the orifice of the urethra. It is, however, at best a haphazard proceeding.

For the removal of a tumor a suprapubic cystotomy is always indicated. The exploration of the bladder is facilitated, and the opening is so placed that the removal of pedunculated tumors is usually easy, and resection of more or less of the wall, if necessary, within reach.

I see little to commend in the very extensive operations involving most of the bladder with transplantation of the ureters. The removal of pedunculated tumors is usually easy and the result satisfactory. The manipulation must, however, often be made by touch alone, as the bladder fills so completely with blood that it is impossible to catch sight of the growth. The finger, however, can usually safely guide the forceps in removal.

Malignant disease most often involves the trigone, and is not infrequently an extension from the prostate. In these cases suffering is often extreme, and a permanent opening will afford great relief. A perineal opening is generally unfortunately placed, and the fungous growth which is likely to follow operation soon interferes with the flow of urine. A drainage-tube is likely to be painful and to provoke hæmorrhage. The suprapubic operation is better placed and of more enduring benefit.

DISCUSSION.

DR. J. WILLIAM WHITE said that, as to the technique of the two operations which Professor Dandridge had compared, he thought all would agree with him as to the method to be adopted in perineal lithotomy. That does not require discussion. As to the technique of suprapubic lithotomy, he could only say, after an experience of a number of years, that he had never found it necessary to resort to the transverse incision, the Trendelenburg posture, and a sufficient median incision having given him all the room he wanted for intravesical manipulations. So, too, he was content with distention of the bladder with an antiseptic fluid. He had never had occasion to change that to dilatation by air; and he still preferred to use the rectal bag, not so much for the purpose of bringing the bladder higher in the pelvis or making it an abdominal organ, as for giving it support during the manipulations necessary after it was opened. He did not regard it, as he once did, as essential to the operation, believing, as Dr. Dandridge had said, that it may be dispensed with if the patient is in the Trendelenburg posture. As to the fatality, which Dr. Dandridge, in a general way, said was greater after the suprapubic section, he saw no *a priori* reasons, given a certain class of cases and

comparing the mortality results after suprapubic and perineal operations, why the division of the tissues and opening the bladder above the pubes should be attended with any greater fatality than the division of the tissues and opening of the bladder below the pubes; it seemed to him that the statement required very careful consideration in regard to each particular class of cases, and should not be accepted as a general surgical rule in selecting these operations.

Taking up the particular points in the order which Dr. Dandridge had mentioned them, drainage of the bladder, if it is for obstruction, is usually for either urethral or prostatic obstruction. If urethral, he thought there was but little difference of opinion as to the propriety of adopting the perineal route for its relief. If the bladder is to be drained for conditions brought about by urethral obstruction, the perineal route offers an opportunity for the relief of the obstruction itself; if the obstruction is prostatic in origin, the perineal route has the advantage of producing an occasional cure. The method of Harrison, to which Dr. Dandridge had alluded, has been followed, in the cases reported by Harrison, by a cure more or less permanent. He thought, however, in cases with a deep posterior prostatic pouch, it was not so easy to plan the perineal operation with safety so that it should reach and drain the bottom of such a pouch, and he had found that suprapubic drainage, by one or other of the siphon methods, had, on the whole, given somewhat better results. He should be disposed, in operating entirely for drainage and where there was evidence of an existing deep prostatic pouch, to choose the suprapubic incision, followed by some method of siphon drainage. If one was certain of reaching such a pouch by the perineal route, it would probably be the method of choice; but one cannot be certain.

For cystitis, pure and simple, the perineal is undoubtedly the method of choice, but he did not think that the subject should be passed by without an allusion to the great neglect by the profession of the use of the permanent catheter. The general practitioner is too apt, in cases of cystitis, without a fair trial of continuous catheterization, to ask a surgeon to perform an operation for drainage, where the intelligent use of the permanent catheter (which can always be kept up for from three to five weeks, and frequently for a much longer time) would very often produce

such changes that no operation would be necessary. He made that remark on the basis of the cases that he saw in consultation, where he had found that the use of the permanent catheter is hardly considered, as a rule, by the medical attendants. If the rules laid down by Guyon and his school for the insertion and care of the catheter, its fixation in the proper position, bringing it not too far within the bladder, and for irrigation of the bladder through the catheter and of the urethra alongside of the catheter, are carried out, it will often enable one to dispense with every other method of drainage.

In operations for drainage in cystitis of the tubercular bladder, the suprapubic is almost always the method of choice. The lesions of tuberculosis of the bladder are apt to be about the vesical neck and base of the bladder (except when they involve the urethral orifices), and infection of the perineal wound is then certain to follow perineal drainage. The suprapubic method is also desirable because it offers an opportunity to treat the lesions directly, and is the method to be preferred, in his opinion.

When bleeding is the indication for drainage, the suprapubic method should be selected. The largest perineal tube is apt to be unsatisfactory in the presence of serious bleeding, the clots from which are much more easily disintegrated and removed through a suprapubic than through a perineal wound.

Permanent drainage of the bladder was, in his experience, unsatisfactory, whether suprapubic or perineal. So far as experience goes, he did not believe that he had any basis for choice. He had not liked the results whether the opening had been above or below the pubes. He thought it to be largely a matter of individual experience, and that there is no broad ground for choosing which route to select.

In regard to stone, which was the second subject taken up by Professor Dandridge, of course all agree that cystotomy of any kind should be done only in exceptional cases. Litholapaxy is the choice with surgeons the world over. As to the exceptional cases that were mentioned by Dr. Dandridge, he thought there was little or no ground for disagreement. Stone and big prostate conjoined (putting aside the operation of castration, which some surgeons would consider and others would not as likely to procure more favorable conditions by causing shrinkage of the prostate), if requiring cystotomy, would seem to be better dealt with by the suprapubic route, enabling one to remove the

stone and to satisfy one's self as to the condition of the prostate, and perhaps to supplement the cystotomy by a prostatectomy. If he had to give a rule, that would be the one he would lay down.

In encysted stone, unless it projects into the bladder and can be lifted out of its pouch with a scoop, the obvious advantages of the suprapubic method make it the operation of choice. In very large and hard stones, those that are not suitable for litholapaxy, the suprapubic has advantages over the perineal method, but he thought it to be open for consideration whether a combination of two methods—perineal lithotrity—will not supplement the suprapubic in these cases. Keith's results, and those of other English surgeons practising in India, have been so successful that most genito-urinary surgeons have their attention turned in that direction, and would, at least, consider the fragmentation of very large stones in the bladder through a perineal opening before deciding finally on a suprapubic operation.

There are certain deformities, like ankylosis of the hip, which would seem to pretty well settle for the surgeon the operation to be selected. A bad case of ankylosis makes a perineal operation a difficult one, and if it were not a suitable case for litholapaxy, it would be thrown into the class of suprapubic operations.

In cases of foreign bodies existing as nuclei of stones, not known in advance, but only discovered after litholapaxy has begun, the perineal operation has usually been a most satisfactory one, in his experience, and one which he thought should be recommended.

In stricture of the urethra, if it is possible for a guide of any size to be inserted into the bladder, the perineal operation gives opportunity for relief of the stricture. In case of false passages with stone, it would seem that the perineal operation again would be selected for the same reasons, and the case of a stone impacted in the vesical neck so that it could not be pushed back into the bladder and made the subject of litholapaxy, a median perineal operation would seem the most direct method.

As to the mortality, in anticipation of this discussion, he had looked up the latest figures he could find from a number of the journals of the last year or two, and from some of the more recent text-books, and added them together, making a number running up into the thousands. He found that the perineal operation in children had a mortality of 3 per cent., and the suprapubic 12 per cent. So there can be no question which operation should be

performed in children. In adults the perineal operation has a mortality of from 8 per cent. to 12 per cent., and the suprapubic 12 per cent., which would throw a choice somewhat in favor of the perineal method, although not so strongly as in children. In old men the perineal operation has a mortality of from 38 per cent. to 40 per cent., while the suprapubic has only 25 per cent. to 30 per cent. So that in old men the perineal operation seems suddenly to be the more dangerous of the two, if these figures can be relied upon. He wished to say once more, because he had omitted much mention of litholapaxy, that he was only speaking of cases in which a cutting operation was required for some reason, that, in his opinion, litholapaxy is the operation of choice in all cases wherever it can be performed.

As to prostatic cases for simple drainage after catheterism has failed, and when no radical operation is thought of, the perineal operation is to be preferred, on account of the chance of cure, which has already been alluded to, and on account of its simplicity of performance; but if any radical operation is contemplated, the removal of any portion of the prostate, there is no question as to the relative advantages of the two operations. Even if prostatectomy is to be done through the perineum, the advantages of preceding it by a suprapubic incision, enabling the prostate to be pushed well down into the perineum, are so great that he thought suprapubic cystotomy should be made, in the vast majority of cases, an essential part of the operative procedure.

As to tumors, except for the distinctly pedunculated tumors, shown to be such by the cystoscope, the suprapubic operation seems to have obvious advantages. Tumors of various sizes and shapes can be recognized and removed. Bleeding, to which Dr. Dandridge had alluded, may be generally controlled with the patient in the Trendelenburg posture, and by careful packing, so that a sessile tumor may be entirely isolated with a little patience and the operator enabled to see what he is doing; then the peritoneum may be opened and a portion of the wall of the bladder inverted and then sutured externally, the peritoneum closed, and the portion of bladder wall containing the tumor incised; all sorts of manipulations may be employed which are quite impossible through the deep perineal wound, working by the touch and in the dark. Except for pedunculated tumors, the suprapubic operation should therefore be selected, and yet his most satisfactory

cases of bladder tumors had been perineal operations, and in his own experience the mortality has been less, and he had had the best results in those cases in which he had been enabled to remove the tumor through the perineal incision. The theoretical arguments are against the selection of that route, but he did not feel that he should be quite honest if he did not say that his own experience seemed to run counter to the rules dictated by theory.

As to the relative dangers of the two operations: In the suprapubic operation, so far as danger to life is concerned, the chief cause would be infiltration in the prevesical cellular tissue. This can nowadays be avoided; it is not often seen, and if there is great risk of it, as when there is a very septic cystitis, Senn's operation of suprapubic cystotomy in two stages may be adopted with increased safety. The reopening of the wound he had not seen after suprapubic cystotomy. He had seen the perineal wound open, so that he could not think that to be a strong argument against suprapubic operations. The tendency of hernia was not very marked in the ordinary cases of suprapubic cystotomy. On the other hand, perineal cystotomies, if lateral, seem to have definite disadvantages. Impotence has followed, and in a case reported by Dr. Cabot there was a reversed seminal current, the semen, upon ejaculation, passing into the bladder rather than by the normal route; stricture has followed. Occasionally one has quite as great a degree of incontinence of urine as that which follows the suprapubic operation, and a fistula in the perineum is not much to be preferred to a fistula above the pubes. The argument as to the direction which "nature" intended the urine to take, whether below or above the pubes, has not much weight in his mind.

Dr. Edward L. Keyes said that he would allow himself to touch upon two points that had been brought up,—namely, statistics in India and the far East, and the recently revived Bottini operation. Of the first he believed that results in India and the East, and in Egypt (where they seem equally good), should not necessarily influence us greatly in deciding what we shall do here. These Eastern people do not seem to die when they are operated upon. Whether they are spared because they do not use alcohol or for some other reason he did not know; but he did know that statistics in those countries are exceptionally good in the hands, seemingly, of all operators. A gentleman who spoke from personal knowledge told him once that there was a certain mission-

ary in (he thought it was) Arabia whom he had known for many years to dispense his services among the natives to their bodies as well as to their souls. He was exceedingly successful in cutting for stone. Finally he died, and his widow, looking about for means of support and finding none, concluded that she would continue his business as a lithotomist, although her only knowledge of the operation consisted in what she had seen her husband do. She therefore got the instruments together and went ahead, cutting for stone. She had plenty of patients and a success equal to that which her husband had obtained.

Now about the electrocautery as applied to the prostatic bar; the worst thing that can be said about it is that Bottini devised and practised and wrote about the method for very many years, and never gained any general following until quite recently in Germany and in New York, in both of which places a special advocate has sprung up, due, he believed, to the fact that the pendulum of general prostatectomy had swung too far, and that efforts to find simpler means of relief were being attempted in all directions.

The matter is not yet judged, and we are not justified in drawing conclusions about it until it has been more widely tested. All that we know is that multiple operations are required, and that the mortality is high,—although, of course, some of the deaths are explained away. Moreover, the operation does not belong clearly to general surgery, but requires special training and technical skill. More operations must be done before we can generalize about it. He considered it still in the balance. It cannot be discussed until many more individuals have performed it, giving points of view from different directions.

Dr. White had mentioned the permanent catheter tied in. This method of drainage is worthy of more consideration. He had a patient long ago who wore a Holt's catheter tied in for about four years, night and day. He kept a cork in it, which he withdrew at stated intervals, and walked about at his business with great comfort, until multiple stone formed from lack of efficient washing. He cut him and removed the stones and a portion of his prostate, enabling him to dispense with his catheter and urinate at will.

He had employed this method of drainage in many cases, and considered it a means not to be lost sight of.

The methods of permanent drainage, both suprapubic and

perineal, he had been in constant contact with for more than thirty years, since his student life. One of his earliest memories is that of an old gentleman who,—he thought it was in the year 1867,—having a prostatic obstruction through which his honored master, Dr. Van Buren, could not pass a catheter, was cut over the pubes for drainage, and wore for nearly a year, until he died, a long double silver tube, made exactly after the plan of the ordinary tracheotomy-tube, and it served its purpose admirably.

One of his own very early operations for permanent drainage was for a case of cancer involving the prostate and floor of the bladder. This patient did very well for a considerable period, wearing a long, silver, flattened perineal tube tied in, but he did not get about very much. And from these cases onward he had seen a variety of hard and soft rubber devices applied for the purpose of continued drainage and worn sometimes through the perineum, sometimes above the bone, with more or less comfort and discomfort, according to the case; but worn, and worn for a long time with safety.

Drainage, of course, is done for the purpose of relieving the necessity of the bladder for a considerable time or permanently, when the natural right of way cannot be re-established, and for the cure of chronic (often putrid) cystitis.

For the latter his preference was always the perineal route; for the former, notably in cases of cancer and tubercle, the suprapubic. Prostatic cases require individual study in electing a route, but, he thought, most of them, when such an unusual means was called for, would in election fall under the suprapubic route, unless the drainage be used as a method for the cure of putrid cystitis; and then he agreed with Dr. Dandridge that the perineum was usually the better direction in which to drain.

As for the actual danger to life, as a consideration, his belief is that the perineal route possesses the less danger. As for ease of execution, both are so simple that there is little choice.

He differed from Dr. White as to the usual cause of death after suprapubic cystotomy. He did not fear hæmorrhage, or sepsis, or infiltration, or suppuration in the prevesical spaces. All of these things may occur, but they can be headed off. The danger after suprapubic cystotomy, and the only dread he had, was urinary suppression. He considered it the most constant cause of death. Of course, patients do die also even with polyuria, with

high temperature, uræmic; and they die in other ways; but he looked upon suppression as the most deadly complication.

And, furthermore, he considered a patient with urinary cachexia, septic, with pyelitis, putrid urine, chronic cystitis, feeble digestion, and apparently no nerve-force left, a better subject for operation, either suprapubic or perineal, than he did the other type of patient, nervous, neuralgic, with hard arteries, abundant, pale, thin urine, of low specific gravity, containing little or no pus, especially if he have also nocturnal polyuria. This latter patient is very likely, after operation, either to go on with increased polyuria and perhaps wandering in his mind, to die uræmic, with a high temperature, or to suffer prompt suppression which does not yield to treatment.

He wished to make another statement also in favor of the use of laughing gas, or of chloroform instead of ether for any operation upon the bladder of an old man, especially if that operation is to be a long one. With laughing gas one may operate for an hour or more, and the patient comes out smiling, without nausea, shock, or depression. Suppression is often due to the effort made by a damaged kidney to eliminate a large quantity of ether from the blood, and the septic pneumonia coming on in the second week after operation is often started by the traumatic irritation of the lungs caused by breathing the dense fumes of ether for a long time.

In many cases of inoperable cancer, involving the prostate and floor of the bladder, he had seen patients made quite comfortable for many months by a suitable permanent suprapubic tube; but he wished to say here that cutting the bladder open and thus relieving tension does not always, as Guyon asserts, relieve tenesmus. He had seen the latter occasionally persist, notably in tubercular cystitis, even when the bladder was kept empty by a permanent suprapubic tube. He remembered one rather curious case, of an old man with cancer, who wore a permanent suprapubic tube for the better part of a year before his death. He enjoyed great comfort, and never had the feeling of vesical repletion or of a desire to urinate excepting when he went to stool; but when he, by voluntary effort, extruded the contents of the rectum at stool, he felt a painful desire to urinate, with a little tenesmus, although the bladder was empty, the tube being in place.

Now as to stone. Any one who is reasonably versed in litholapaxy by having operated a number of times must be convinced of its general applicability for children, adults, and old people, in a great majority of instances. But he believed that it was generally conceded that when, for any reason, a stone should not be crushed, the suprapubic operation was called for, and notably under these four circumstances:

(1) When the stone is excessively large.
(2) When it is encysted.
(3) When it is complicated by tumor.
(4) When it has formed upon a foreign body.

Of course, when the contraindication to litholapaxy is urethral obstruction, then the perineal route is called for, because that operation deals not only with the stone but often with its cause (stricture). He wished, however, to make the point that there are a certain number of quite small stones in prostatic subjects which in very skilful hands might be mastered by litholapaxy, but which, none the less, will do better if treated by cystotomy suprapubically. He referred to cases of small, flat stone, difficult to pick up from the post-prostatic pouch, notably in cases where the prostate is long and has an irritable granular bar. In such cases the irritation of this bar, produced by the manipulation with large instruments, often causes so much cystitis that, although the stone be wholly removed, the patient is worse off after the operation than before, and the effort at his relief may give him a cystitis of longer duration and of greater discomfort than would have been given by a well-performed prostatectomy. In these cases he had been often willing to make the patient's necessity the surgeon's opportunity, and to cut where he might equally well have crushed, believing it to be to the patient's advantage to do so.

For prostatic hypertrophy prostatectomy, it seemed to him, especially total prostatectomy, had been overdone. In this country he believed, and he was sure in France, there is to-day a tendency to do less of it, and to return oftener to the more conservative use of the catheter, with vesical lavage. But still prostatectomies have to be done, and the question is the election of a method. Upon this point it is very difficult to generalize.

His experience in the matter led him to believe that partial prostatectomy, if the urethral outlet be lowered at the same time,

will give as good a result in many instances as total prostatectomy, and with less risk to life. Very soft prostates lend themselves readily to enucleation and may be properly shelled out whole. Interstitial fibromyomata, of course, should be taken out; but in many, very many, cases of prostatic overgrowth, particularly the very hard variety, if the fringes and pedunculated outgrowths, and horse-collar projections, and third lobes, and, notably, the bar, be thoroughly removed and the internal urethral orifice cut away with an emporté pièce well into the prostatic sinus; if all this be done, the functional condition of the patient is rendered as good as after total prostatectomy; the operation is shorter, hæmorrhage less, danger to life less, and all these things can sometimes be done safely and effectively through the perineal route, when the prostate is not peripherally very large, so that the finger, passed through the wound, can easily pass beyond the vesical orifice and explore thoroughly. In such cases, then, he preferred the perineal route for the performance of partial prostatectomy. The results are excellent, and danger to life relatively small. When, however, the prostate is very large, it cannot be properly attacked through the perineum, and the suprapubic route must be elected, even if the prostatectomy is to be partial.

Finally, as to a choice of route in the case of tumor or cancer there can be no question. The high route, allowing the faithful eye to aid the possibly faulty finger, must be elected.

Dr. Arthur T. Cabot confined himself to a simple statement of his personal experience in the methods of cystotomy.

In regard to the choice of incision for bladder drainage, he did not recall any cases in which he had made incision into the bladder in the past ten years for bladder drainage alone. He had operated a number of times where drainage had been a very essential part of the operation, but in which the operation had also the very important function of correcting some condition which was responsible for the persistence of the cystitis, such as obstruction in the prostate, in the urethra, or some tumor or calculus in the bladder. He thought the reason that he had not opened the bladder for drainage had been that he had had such good success in the method of drainage through an inlying catheter. He had used this form of drainage a great many times, even on patients who were desperately sick, too sick, it seemed, to bear a cutting operation, but who had improved immediately

when adequate drainage through a catheter was supplied. Some of these patients, in whom the urine had been almost suppressed, and who already showed evidences of incipient uræmia, had quickly recovered after the catheter was placed in position. He had even used catheter drainage in cases of quite profuse hæmorrhage into the bladder. In such cases it is possible, by patience, to suck the blood out by attaching a stiff rubber tube to the end of the catheter and, as it were, milking it,—that is, stripping it and allowing it to expand, and thus drawing the clots forward out of the bladder. In a number of cases in which he had used this method the hæmorrhage had ceased when the bladder was emptied. In the few cases in which the hæmorrhage had persisted he had opened the bladder, and always by the suprapubic route, which he selected, feeling that it was important to discover and remove the cause of the hæmorrhage, and to afford opportunity, when it was troublesome, to pack the bladder with gauze.

In regard to the operation for stone, he believed, as had been already said, that litholopaxy was the operation of choice. He had never yet met a stone so hard that it could not be crushed, and yet small enough to be properly approached by the perineal route, so that in cases in which he had failed in crushing he had always used the suprapubic incision.

As to the statistics of crushing, he did not think the results reported from India need any special explanation, for a recent examination of his own results showed that in 116 cases there were four deaths, and of these, two patients died of pneumonia, consequent upon a chronic bronchitis, which existed before the operation. The average age of the patients was a little above sixty years. He could make no comparison of the two operations under his own hand, for he had used suprapubic lithotomy only in difficult cases, where he could not crush. In children he thought that lateral lithotomy was very much safer than the suprapubic operation. No doubt most children can be treated by litholapaxy, especially if, in the cases where the anterior urethra is narrow, one opens the perineum and makes the operation a perineal lithotomy. It is quite extraordinary how greatly the perineal incision adds to the ease of the operation. The deep urethra is so distensible that it easily admits instruments that were much impeded, both in their introduction and their after manipulation, through the penile urethra.

He thought there was comparative unanimity of opinion that the high operation was the proper one for dealing with bladder tumors. Dr. White had said that he had had better results in the few cases that he had done by the perineal route. Possibly that was because they were instances of simple pedunculated growths. Even in these cases, the suprapubic opening affords better opportunity for thorough removal.

In the operative treatment of prostatic hypertrophy he had had but little experience in the use of the perineal incision. He had operated by the perineal route and followed the method proposed by Dr. Harrison, in some of his early cases, with fairly good success. He had only employed the suprapubic route of late years, because it gives a better opportunity for appreciating and correcting the conditions causing the obstruction. The perineal incision has, however, one advantage, especially when the obstruction is a bar across the neck of the bladder; and this is that the tube introduced through the prostatic urethra for drainage keeps the wounded surfaces apart during healing, and thus moulds and tends to keep open the newly formed outlet of the bladder. It would seem well to introduce perineal drainage after a suprapubic prostatectomy when the conditions seem to make this moulding of the urethral orifice important. For simple purpose of drainage after prostatectomy he had not for many years used a perineal tube, for he had always found suprapubic drainage with two tubes thoroughly satisfactory.

As to one or two other incidental points, aside from the direct line of discussion, of interest. Dr. White had pointed out the real use of the colpeurynter; that it raises the base of the bladder and brings it near the suprapubic opening, and for that purpose Dr. Cabot had used it. He operated in the Trendelenburg position, and as the object of that position is to induce the bladder, by its weight, to fall towards the umbilicus and so to increase the distance between the fold of peritoneum and the pubes, it seems more reasonable to fill it with a heavy fluid, which will add to its weight, rather than with air.

DR. L. S. PILCHER said that it might not be amiss to remember that the suprapubic route for reaching the bladder had been appreciated as generally practicable only during the past few years, although the history of surgery shows that the sixteenth century should be credited with its introduction. It is true that

since that time it has been suggested from time to time, but only to be laid aside, so that all certainly know, when it is said that fifteen years ago it was unused and had no standing as a surgical procedure, that the statement is correct. That being the case, the mental preoccupation of those surgeons whose experience dates back beyond that period has been with methods other than the suprapubic. It is only since the suprapubic operation has been demonstrated to be a practical thing that bladder surgery has made any very great advancement over that which it had attained in the practice of our fathers. In these more modern indications for attack on the bladder, it has been stated by those who have already spoken that the suprapubic route, as a rule, is the one to be adopted, but in the one class of bladder operations in which our fathers excelled us,—viz., that for the removal of stone,—one still finds a frequently expressed opinion that procedures which can be used through the urethra and perineum are still the procedures of choice. The previous speakers had each repeated that the method of choice for attacking stone in the bladder is that of litholapaxy. But since, in the work of the speaker during the past twelve years, litholapaxy has not been the method of almost universal choice, he ventured to strike a discordant note by trying to give some reason why it had seemed to him in his own work to be a more proper thing, as a rule, to reach a stone in the bladder by a cutting operation through an incision above the pubis than to trust to the attempt to remove the stone by crushing and suction and washing.

He had no statistics to present. He doubted very much whether these matters were to be settled by statistics. Any surgical method of procedure can be tested by general principles rather than by statistics.

He asked first, whether the reaching of a stone in the bladder and its crushing by an instrument and its after-evacuation by a process of suction and washing is a more simple operation than the operation of making a simple incision into the bladder and its removal by a forceps. Does it make any less traumatism? Does it take any less time? Does it involve any less shock? Is it a less serious operation as a whole?

It had seemed to him that, as a rule, the suprapubic incision could be done, and is being done to-day, in a manner that constitutes it a more rapid, a more simple, a less severe operation, and

one which is attended with greater likelihood of permanent cure than the procedure which is understood by the term of *litholapaxy*. He spoke from the stand-point of a general surgeon, not from that of one who has devoted himself to dealing with this class of cases specially, who, by reason of his special aptitude or special experience has been able to obtain a special skill in the performance of a peculiar technical procedure, but rather from the stand-point of the general surgeon who occasionally has to do with this condition,—what should be the operation of choice for this numerous class of surgeons, that they should seek to empty a bladder of stone by litholapaxy or by the perfected suprapubic incision.

He was inclined to believe, from the observation of the results of the work of others and from the limited experience which he had had himself, that in the hands of the average surgeon the operation of litholapaxy is by no means a generally safe and desirable operation; that it is in many cases an incomplete operation; that it is in many cases a severe and fatal operation; that it is a more difficult operation to perform than is the operation which may be done of opening the bladder above the pubes or even through the perineum. For these reasons he found that for the last ten years the apparatus for crushing the stone in the bladder in his own work has been more and more left upon the shelf, and that more and more the attempt to remove the stone as a matter of routine by the incision had been adopted. Any bladder into which a catheter can be introduced, however small, —and the softer and less irritating it is the better,—and which can be at all dilated, when it is possible to have access to the inflating bulbs of the ordinary syringe, and still better, if one has an inflating bulb of a cautery apparatus, any such bladder may be readily and in a moment inflated and made to protrude above the pubes so as to be readily accessible; no special apparatus is needed; the knife, forceps, and the simplest retractors are all that are required. When the bladder is opened, the possibility of its full exploration is secured, the emptying of the bladder is a matter of but a short time, while the least possible traumatism is inflicted upon it. When one compares the relative amount of traumatism of the suprapubic with that of the perineal operation, it seemed to him that even in the simplest perineal operation (and in the hands of a skilled operator it is ordinarily a simple operation) the

amount of traumatism is less in the suprapubic operation, and certainly the interference between the vascular and nervous relations is much less in the suprapubic than in the perineal; the reflex, distant, late contingencies are likely to be much less in the suprapubic than in the perineal operation, wherefore it was that in his own work he had adopted the suprapubic operation as the method of choice even in dealing with ordinary cases of stone in the bladder.