neum. Two distinguished operators state they always apply the blades to the biparietal diameter, when possible, and they use the Davis forceps. When, from any cause, the blades cannot be adjusted to the sides of the head, they are applied at the sides of the pelvis; but under these circumstances both of the gentlemen wisely discard the Davis forceps; one substitutes the Simpson, and the other the Simpson or Tarnier. There were numerous exceptions to the above rules; for instance, one gentleman, emphatic in his expression of the value of applying the blades to the sides of the pelvis, uses a strong French forceps, the tips of which meet, and the greatest distance between the blades is 2¼ inches.

The comparative compressive power of different styles of forceps is recognized by a number of operators, who employ one or another under conditions which do or do not require that action. One correspondent states that in ordinary cases, as uterine inertia, he uses the Simpson forceps; in pelvic or cranial disproportion, when some compression is necessary, the Elliot; in greater narrowing, but above the limit where craniotomy is to be considered, the Hodge or Wallace.

Another employs the Simpson forceps in first and second positions of the vertex, the Tarnier in third and fourth, and the short forceps when the head is low.

According to the views here expressed, the only conditions generally recognized for selecting the different varieties of forceps are:

1st. The high or low situation of the head, and

2d. The compressive power of the instrument.

Accepting the opinion of the majority of replies to the circular letters regarding the advisability of applying the blades to the sides of the head when possible, and recognizing the difficulties in the way of accomplishing it in many cases, a third indication advanced is the oblique and transverse positions of the head, for which, and to overcome the difficulties mentioned, I submit the antero-posterior forceps curved on the flat.

In reply to objections made on the ground that this would unnecessarily complicate the armamentarium of the obstetric operator, I would ask to consider one moment whether it is unnecessary.

Does not the dentist possess a number of forceps, curved on the flat and edge, and in all conceivable angles, and does he not select that instrument which best enables him to seize and extract the tooth? He is guided in the selection of the forceps by the position of the tooth, and chooses the instrument that is curved in proper manner to grasp it most securely. Is the responsibility of the obstetrician less than that of the dentist? Is it not incumbent upon him to ascertain positively, in every case requiring artificial delivery with forceps, the position of the head and to adjust the forceps in such manner that he can extract it according to the natural mechanism of labor.

With the aid of anæsthesia and the whole hand, if necessary, introduced within the vagina, no excuse exists for failure to clear up any doubt regarding the position.

Let me repeat what is stated in the beginning of this communication: "Labor is absolutely a physical act, accomplished according to a well defined mechanism; therefore, the laws governing the application of artificial aid should be precise and absolute." Only until these laws are established and followed will there exist a uniformity of practice in the use of the forceps.

The advice of eminent obstetricians that one pair of forceps should be made to answer for all operations has had, and still has, its evil influence. In no other operation, and in no other special work, is the operator hampered by such advice.

The surgeon has forceps, scissors, knives and needles curved at different angles on both the flat and edge, and he uses them to the best advantage. Why not tell him to discard all these, as they unnecessarily complicate *his* armamentarium? Tell him that one of each, with a proper curve, will answer for all of his operations, and he should learn to employ it only. I claim it equally unscientific to bind the obstetrician to a single pair of forceps, with which he must accustom himself to do all this class of work; and I repeat, "he should be equally expert with several, and employ one or another, according to the circumstances of the case, always selecting that instrument which best enables him to apply the blades to the sides of the head."

THE CHOICE OF OPERATION FOR STONE IN THE BLADDER.

Read in the Section of Surgery and Anatomy, at the Fortieth Annual Meeting of the American Medical Association, June, 1889.

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In order to make the drift of this paper at once clear, I wish to state at the outset the conclusions I have reached by a study of the results of others in stone operations, and from the moderate experience I have had in these cases myself. Unfortunately, residence in a region where stone in the bladder is rather rare has made the accumulation of personal observations slow, but, on the other hand, my association with Dr. Bigelow has given me unusual advantages in getting an understanding of the operation which he devised and christened "litholapaxy," and of which I shall especially speak to-day.

In my opinion, we have in litholapaxy the operation of choice for the removal of most stones. While this is the rule, there are exceptions to it,

and the varying conditions surrounding stone in the bladder, will now and then lead us to choose some other operation for their safest removal. The surgeon who best appreciates these varying conditions, and selects in each case the operation which most surely avoids the dangers surrounding it, will arrive at better results than any advocate of a special operation, however expert.

I realize that some objections have been urged against litholapaxy, and that superior advantages have been claimed for other methods of stone removal. I shall try to fairly consider these objections, and to justly appreciate the strong points of other operations. Before entering seriously upon our subject, I wish to note one of these objections which seems to me to merit no extended consideration, but which has received a certain amount of weight from the unsupported assertions of some of the German surgeons. It has been urged by them that litholapaxy requires a special skill for its performance, and should not, therefore, be commonly employed. Certainly, none but qualified surgeons should undertake any operation for stone in the bladder, and it seems to me that the question to be discussed is, not which operation is safest in the hands of a tyro, but rather this: By what use of the different methods of stone removal can a competent surgeon accomplish the best results? In modern surgery the test of merit is looked for in results. No operation, however brilliant, can claim superiority over rival methods if its death-rate is much higher than theirs. The best operation is the one that saves the most patients, unless some serious interference with bodily function more than counterbalances the gain in safety.

Let us examine the results of the various operations for stone, in respect to their rates of mortality, their interference with bodily function, and the completeness of cure which follows them. We have, in general, three methods of operation to choose among, namely: perineal lithotomy, suprapubic lithotomy, and litholapaxy. Perineal lithotomy may be again subdivided into median and lateral lithotomy. We have here several wholly different methods, each of which has certain advantages over the others and each of which, on the other hand, has its own difficulties and dangers, to be recognized and avoided. The cases for which these operations are to be considered and selected, also differ vastly in their conditions and complicating surroundings, so that it may well be seen that each case should be studied for itself, and the operation chosen which best meets the difficulties and avoids the dangers present in that particular instance.

First, looking at the rates of mortality obtained by these operations, we find at once that we cannot properly compare the results in patients of very different ages. The mortality in children and young adults, after any operation upon the bladder, is distinctly less than it is in advanced age, and, as we shall see later, there are at different ages changes in the organs concerned which make marked differences in the manner in which the various operative measures are borne. For the sake of convenience in this study, cases may be grouped in three categories:

Children, from birth to 14 years of age.

Adults, from 14 to 50.

Old men, from 50 upwards.

This division of the cases is somewhat arbitrary, but the ages of 14 and 50 are selected as marking, more or less accurately, certain epochs in the development and decay of the genito-urinary organs. At about 14 we look for the changes in the size and sensibility of these organs which accompany the arrival at puberty; and at 50, senile changes in the prostate and bladder begin to make their appearance, which often interfere seriously with the healthy performance of the functions of those parts. In the collection of statistics those tables have been used in which operators have published all of their results, and reports of single cases are not included. This is done to avoid the danger of forming tables of exceptional results; for single cases are more likely to be reported when successful than when they resulted unfavorably. Further, owing to the recent improvements in technique and to the influence which the general adoption of antiseptic measures has had upon surgical diseases, it is evident that the statistics of old times cannot be accepted in settling the present status of these operations; and, therefore, only cases occurring since modern methods came into vogue have been used in this study.

SUPRA-PUBIC LITHOTOMY.

Operator or Reporter.	Children.				Adults.				Old Men.			
	No. of Cases.	Recovered.	Died.	Mortality.	No. of Cases.	Recovered.	Died.	Mortality.	No. of Cases.	Recovered.	Died.	Mortality.
König	.	.	.	.	1	1	.	.	4	.	4	.
Werewkin	24	17	7	.	.	.	.	.	.	.	.	.
Assendelft	78	76	2	.	24	24	.	.	.	.	.	.
Cabot	.	.	.	.	1	1	.	.	.	.	.	.
Tremaine	1	1	.	.	1	1	.	.	1	1	.	.
Thompson	.	.	.	.	.	.	.	.	6	5	1	.
Guyon	.	.	.	.	.	.	.	.	8	5	3	.
Mikulicz	3	2	1	.	.	.	.	.	.	.	.	.
Walker	3	3	.	.	.	.	.	.	.	.	.	.
Garcia	43	37	6	.	.	.	.	.	.	.	.	.
Recent foreign	55	42	13	.	.	.	.	.	.	.	.	.
Recent British	33	33	.	.	.	.	.	.	.	.	.	.
Total	240	211	29	12%	27	27	.	0 %	19	11	8	42.1%

Garcia, from a collection of 106 cases of all ages, calculates a death-rate of 24.4 per cent. Tuffier, from 120 cases without regard to age, has a death-rate of 27 per cent. Dulles, among 231 adults, finds a mortality of 32.4 per cent., while among 132 children there was a death-rate of 21 per cent.

LITHOLAPAXY.

Operator or Reporter.	Children.				Adults.				Old Men.			
	No. of Cases.	Recovered.	Died.	Mortality.	No. of Cases.	Recovered.	Died.	Mortality.	No. of Cases.	Recovered.	Died.	Mortality.
Freyer	. .	. .	. .	. .	81	77	4	. .	69	68	1	. .
Keegan	114	110	4	. .	. .	. .	. .	. .	. .	. .	. .	. .
VanderVeer	. .	. .	. .	. .	10	8	2	. .	11	8	3	. .
Kerr	. .	. .	. .	. .	15	15	. .	. .	7	7	. .	. .
	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
Cabot[1]	. .	. .	. .	. .	9	9	. .	. .	33	31	2	. .
Mass. Gen'l Hosp.	1	1	. .	. .	34	32	2	. .	68	57	9	. .
Total	115	111	4	3.5%	149	141	8	5.3%	188	173	15	8 %

[1] One from bronchitis and pneumonia.

Guyon had a mortality of 5.2 per cent. in 647 cases of all ages. Usigli calculates a mortality of 4 per cent., while Tuffier places it at only 3 per cent.

PERINEAL LITHOTOMY.

Operator or Reporter.	Children.				Adults.				Old Men.			
	No. of Cases.	Recovered.	Died.	Mortality.	No. of Cases.	Recovered.	Died.	Mortality.	No. of Cases.	Recovered.	Died.	Mortality.
Freyer	143	143	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
Werewkin[2]	147	138	9	. .	. .	. .	. .	. .	. .	. .	. .	. .
Cabot	3	3	. .	. .	. .	. .	. .	. .	1	. .	1	. .
Mass. Gen'l Hosp.	16	16	. .	. .	2	2	. .	. .	1	. .	1	. .
Carrow	46	44	2	. .	76	71	5	. .	14	13	1	. .
Rivington	. .	. .	. .	. .	1	. .	1	. .	3	3	. .	. .
Total	355	344	11	3.1%	79	73	6	7.6%	19	16	3	15.7%

[2] Seven fistulæ.

Freyer gives the following rates of mortality after lateral lithotomy, arranged according to age. They are calculated from 987 cases occurring during the year 1883 in the Northwest provinces of India:

Rate of mortality up to 20 years	5.1	per cent.
" " " from 20 to 40 "	10.7	" "
" " " above 40 "	31.9	" "

Rosenthal, from a collection of 400 cases, deduces the following rates.

Mortality, from 1 to 5 years	3.5	per cent.
" " 6 to 11 "	2.1	" "
" " 12 to 16 "	8.4	" "
" " 17 to 29 "	15.7	" "
" " 30 to 66 "	38.8	" "

These statistics probably give a more accurate rate of mortality for old men than in my table, in which so few cases occur at that time of life.

From these statistics we see that in childhood, judging from the results as to mortality, there is little to choose between lateral lithotomy and litholapaxy. The death-rate in each is but little over 3 per cent. Suprapubic lithotomy is more dangerous, with a death-rate of about 10 per cent. In adult life, the death-rates alter somewhat in favor of litholapaxy. As the prostate and urethra enlarge, and the parts about the neck of the bladder become more vascular, the dangers incident to cutting through them increase. On the other hand, the increase in the size of the parts makes the performance of litholapaxy comparatively easy and safe. Suprapubic lithotomy keeps its place as a more dangerous operation than either. In old age the rates of mortality are overwhelmingly in favor of litholapaxy. While the dangers attending all the cutting operations have increased very greatly, the mortality after crushing is very little higher than it was earlier in life.

INTERFERENCE WITH THE FUNCTION OF THE PARTS.

It is somewhat exceptional to see a serious loss of function follow any of the operations for the removal of stone. A litholapaxy, carefully performed, should never cause any lasting injury of the genito-urinary organs. The suprapubic incision rarely causes any after-trouble, although occasionally a fistulous opening remains which cannot be closed, and is therefore a constant source of discomfort to the patient. The perineal operations, entering as they do through the neck of the bladder, are much more likely to cause serious trouble. The position of the seminal ducts in the lower part of the prostate, makes their injury by an incision in the floor of the prostatic urethra quite probable. The median operations may sometimes avoid this when the stone is small enough to be removed by stretching the neck of the bladder, but even then lacerations are likely to occur. The lateral incision has the advantage that, while giving more room, it endangers only one of the ducts. The erectile tissue, known as the caput gallinaginis, is also liable to injury, and this may cause sterility. Incontinence is an occasional result of the perineal incisions, owing to their interference with both of the sphincters of the bladder; and fistulæ, though rare, do sometimes occur, and may be very persistent and troublesome. Injuries of the rectum during lateral lithotomy are unnecessary and accidental; they still happen often enough in the hands of expert operators, to make it worth while to take the chance of this into account in deciding upon an operation.

COMPLETENESS OF CURE.

It is a not uncommon experience to see a second or a third attack of stone in the same patient. In order to understand how far this reappearance of a calculus is dependent upon the operation by which its predecessor was removed, let us consider the ways in which a recurrence of stone may come about.

1. A uric acid stone may be followed by another, on account of the persistence or reappearance of the uric acid diathesis. The same may be true, though less commonly, in the case of an oxalic stone, and may even occur with a phosphatic stone due to phospaturia of constitutional origin.

2. The successive escape of several stones from

the kidneys may give rise to several consecutive attacks of stone in the bladder. These stones may be uric, oxalic or phosphatic.

3. A soft, phosphatic stone may be reproduced after removal, if the chronic cystitis and alkaline condition of the urine, which led to its original formation, persists. This is not uncommonly seen in those cases where an obstruction to the complete emptying of the bladder perpetuates the fermentation of the urine.

4. Lastly, if a fragment is left after an operation, it may serve as a nucleus for another stone. The danger of this mischance is greatly increased by any obstruction to the flow of urine, such as is caused by an enlarged prostate. The bladder, in such a case, is often sacculated, so that fragments are more likely to escape removal by the evacuator after litholapaxy, or by the lithotomy scoop and forceps after lithotomy; and if such a fragment be left, it is very unlikely to be voided by the natural efforts of the bladder, but remains in the residual urine. A healthy bladder that completely expels the urine at each act of micturition usually frees itself of such small fragments.

It is plain that recurrences due to the patient's diathesis, in which a new stone forms years after the removal of a former one, cannot be laid at the door of the operation, being as likely to follow one method of removal as another. And the same is true when successive escapes of renal calculi from the kidneys give rise to recurrent attacks of stone. Among my cases, 47 in number, I have seen three instances of the recurrence of uric acid stone due to the patient's diathesis, and have had one case in which calculi of renal origin gave rise to successive attacks of stone in the bladder.

Next, we have the cases in which a recurrence is due to a persistent cystitis with consequent deposition of phosphatic material. I have seen four instances of this sort, all of them occurring in patients with greatly enlarged prostates, and in all of which I was able to satisfy myself conclusively that the recurrence was not due to the retention of fragments. In such cases, the later attacks of stone cannot be ascribed to incompleteness in the operation, but rather to neglect in the after-treatment.

It is obvious that to prevent this sort of recurrence, it is important to entirely relieve the cystitis before allowing the patient to pass from observation, and then to send him away with a clear understanding of the importance of immediately correcting any tendency to alkalinity of the urine or to pus formation. When an obstructed urethra is the cause of the cystitis, the obstruction should be relieved if possible. In case of an enlarged prostate, the evils of retained urine must be lessened as far as possible by systematic catheterization. The moment that any considerable amount of mucus or other evidence of commencing fermentation appears in the urine of one of these patients, thorough irrigation of the bladder must be instituted and kept up until the normal condition is again reached. If milder measures fail to keep the urine in a fairly good condition, or if the catheter causes pain and has to be used very frequently, a prostatotomy may be called for to correct the obstructing condition. It may sometimes seem well in these cases, if the stone is a small one, to remove it by a perineal incision, for the sake of the opportunity to at the same time operate on the prostate and to drain the bladder. Dr. J. P. Bryson, of St. Louis, has called attention to this occasional advantage of a perineal operation for stone. A surgeon selecting such an operation should, however, bear in mind that the perineal operation is about three times more dangerous to life than litholapaxy, and should balance the hoped-for advantage against this certain risk. In one such case, the writer did a combined litholapaxy and prostatotomy; first crushing and pumping out the stone, and then, through a median incision, dividing the middle lobe of the prostate. The operation was no more severe than a simple prostatotomy, and the power of urination, which had been absolutely lost, was restored to a very considerable extent.

Finally, a stone which has for its nucleus a fragment of an earlier stone is obviously the result of an incomplete operation, and it has been urged against litholapaxy that such recurrences are especially liable to take place after it.

In the early days of this operation such instances of incomplete evacuation were more common than now, and were due to a want of thoroughness in the surgeons rather than to a necessary lack of completeness in the operation itself. To guard against such retention of fragments, many operators now make it a rule to always wash the bladder once or twice with the evacuator some days after the operation, before the patient is discharged. These washings cause but little discomfort, and may usually be done without anæsthesia. These washings, if successful in obtaining débris, should be continued at intervals of a few days until fragments are no longer obtained, and in cases of cystitis, where the tendency to the deposition of phosphates is very great, it is a good plan to give an occasional wash with the evacuator up to the time that the urine becomes clear and loses its alkalinity. In using the pump at the time of operation, and in these subsequent washings, the sacculated character of many of these bladders should be borne in mind, and a careful search should be made for fragments which may be caught in pockets. The orifice of the evacuating tube should be turned successively toward each part of the cavity, to dislodge with the current all such fragments, and, lastly, the pouch which so often exists behind the prostate should be searched in this way. For these manœuvres a straight tube is especially adapted and

should, when possible, be used. With a careful observance of these precautions, I confidently believe that a retention of fragments after litholapaxy need be of no more frequent occurrence than after lithotomy. Indeed, it has happened that fragments left by lithotomy have been subsequently removed by the litholapaxy pump.

SELECTION OF OPERATION.

In Childhood.—As the statistics show, the mortality after any operation for stone in children is small. Lateral lithotomy and litholapaxy are very nearly equal in this regard, and both are decidedly safer than suprapubic lithotomy. The crushing operation has the great advantage that it avoids injury to the seminal ducts and the rectum; also that it does not give rise to fistula or to incontinence of urine; all of which are occasional results of perineal lithotomy. An ample experience has shown that the urethra and bladder of a child will tolerate a considerable amount of instrumentation. It would therefore seem wise to use litholapaxy for all small stones or stones of moderate size (from 1 and 1½ to 2 centimetres in diameter), and for stones larger than this to do lateral lithotomy, except when they are very large (3½ centimetres and upward in diameter), and then suprapubic cystotomy is to be resorted to.

The ease with which bimanual palpation can be practiced in children, with a finger in the rectum and a hand on the abdomen, makes it possible to judge, pretty closely, the size of the stone, and so to select intelligently the best operation for its removal. The consistency of a stone is also to be taken into account when litholapaxy is thought of, and stones of considerably larger size than is above indicated may properly be crushed if they are soft and friable. The quality of a stone in these regards may usually be determined with some degree of accuracy by the sensation imparted to the sound and by a knowledge of its probable constituents, which can often be gained by an examination of the urine. Phosphatic stones are usually soft, as are also pure uric acid stones. The urates make a rather hard calculus, while an oxalic stone is exceedingly hard and resistant. Certain other conditions which would lead us to employ some other method than litholapaxy will be spoken of in considering operations on adults.

In Adults.—Whether we consider the danger of the various operations for stone in the adult, or the likelihood of disturbance of function following them, we are led to regard litholapaxy as the operation of choice for stone removal. With the efficient lithotrites and evacuator which made "lithotrity at one sitting" possible, it is now usual to remove stones of considerable size and hardness, and practically it has been found that under ordinary conditions in adults, any stone which is suitable for lateral or other perineal lithotomy is suitable for litholapaxy, and that even stones so large that they would require a suprapubic incision if they were removed by the knife, may, when reasonably friable, be safely crushed and pumped out. A number of instances are on record in which stones between 2,000 and 3,000 grains in weight have been successfully removed in this manner.

The exceptional cases in which litholapaxy cannot be used are as follows:

1. A very large and hard stone may resist every attempt at crushing, especially if it is tightly grasped by the spasmodically contracted bladder.

2. A stone may have as a nucleus a foreign body such as a piece of necrosed bone or a bullet, too hard to crush and too large to pass out through a tube.

3. An encysted stone may be out of reach of the lithotrite.

4. Some writers hold that stricture of the urethra may prohibit litholapaxy. This cannot often happen, for strictures, however close, yield readily to divulsion, which may immediately be followed by the crushing and evacuation of the stone. I have so often seen these two operations successfully done together on an etherized patient, that I can but think this the best practice. While it economizes time, it saves the patient much needless manipulation.

5. False passages may exist, which so interfere with the introduction of instruments that the dangers of the operation are greatly enhanced, and the question of lithotomy is to be entertained.

6. The hip may be anchylosed in a position which interferes with the use of urethral instruments.

7. A stone may be so lodged in the entrance to the urethra, that it cannot be pushed back into the bladder where it can be seized by the lithotrite.

In any of these exceptional cases in which litholapaxy cannot be applied, we have to make our choice between a perineal and a suprapubic incision. The danger attaching to the perineal incision is, according to present indications, decidedly less than that after the high operation, so long as it is applied to small or medium-sized stones; but when large stones are dealt with, the facts are reversed, and the perineal operation becomes the more dangerous of the two. Under ordinary circumstances, as has been said, litholapaxy disposes of the stones of a size suited to perineal removal, and these operations through the perineum have therefore fallen largely into disuse for adult cases. They find occasional application in cases of stones of moderate size where false passages, anchylosis of the hip or the presence of a foreign body make litholapaxy impossible. They may also be used rarely when severe obstructive disease of the prostate makes it desirable to combine prostatotomy with the operation for the removal of the stone. A stone impacted in the neck of the bladder, if it

cannot be dislodged, may properly be removed through the perineum.

Suprapubic lithotomy is to be employed in cases where the stone is too hard and large to be crushed, or where an impervious urethra makes the introduction of a lithotrite or staff impossible. In case of an encysted stone the high operation is also the best, as the thorough inspection of the bladder which it makes possible enables us to treat the condition intelligently. Occasionally, cases are met with in which the prostate is so large that the bladder cannot be reached through the perineum, and here, of course, one is driven to do a high operation if a stone exists which it is not possible to crush.

In Old Age.—The same indications are to be followed as in the adult, except that it is to be remembered that perineal incisions are especially dangerous in old men, and not to be undertaken for the removal of stone without urgent reasons. The suprapubic operation will therefore be called upon to deal with most of the stones which are unsuitable for litholapaxy, and even with this incision, a prostatotomy or prostatectomy may be done after the removal of the stone if the conditions require it. As was seen by the statistical tables, it is in old men that the crushing operation has the most unmistakable advantage. The urethra and bladder, in old age, are very tolerant of the use of instruments, so that litholapaxy is ordinarily well borne.

In conclusion, I wish to say a few words about my own experience with stone operations. I have operated forty-seven times, selecting the operation in each case according to the principles I have set forth above. There were forty-two litholapaxies, nine of them in adults and thirty-three in old men; three lateral lithotomies, all in children; one median lithotomy in an old man and one suprapubic lithotomy in an adult.

Of the cases of lateral lithotomy, two were done before it was believed possible to do litholapaxy in children. In the third case there were two stones, one of which was firmly fixed in the prostatic and membranous urethra. The median lithotomy was done for a small stone impacted in the prostatic sinus, and the suprapubic operation was done for a large, hard stone, in a patient having a bad stricture of the urethra with false passages about it. Among these cases there were three deaths; two following litholapaxy and one after median lithotomy. Of the cause of death in these cases I wish to speak briefly.

Case 1 was a broken-down man of 69, for whom litholapaxy was done for a phosphatic stone weighing 98 grs. The operation went smoothly and the relief from it was complete. The urine cleared up and, after a few days, was passed normally without pain or frequency. In short, he made a perfect recovery from the operation. On the fourth day a chronic bronchitis that he had had before entering the hospital became much aggravated, led to pneumonia and of this he died on the ninth day.

Case 2 was a patient 71 years of age, whom I saw at Bennington, Vt., August 24, 1887, in consultation with Dr. Leroy McLean, of Troy, N. Y., and Dr. Jennings and others of Bennington. He had had trouble with his bladder for three or four years, but had been able to keep about with it till eight days before I saw him, when he had suddenly been seized with an acute exacerbation of cystitis with retention, for which the bladder was aspirated over the pubes. During one of the aspirations the needle touched a stone. When I saw him he was suffering from great pain and frequent painful tenesmus; his pulse was rapid and weak, his countenance sunken. The urine, which had been abundant at first, had almost ceased during the past twenty-four hours. The general feeling at the consultation was that the patient was in a dying condition, and that any operation could only be looked upon as a last effort to give him some more chances of recovery. With this understanding litholapaxy was undertaken. The bladder contained 2 or 3 ozs. of thick, bloody mucus, with almost no urine. The stone was very hard (oxalic), and weighed 1 oz. The operation was a long one. After the stone was out, a catheter was tied in the bladder. There was no reëstablishment of the flow of urine and the patient died on the following day.

In the first case death was due to a pneumonia, and the bladder and kidneys were in good order. In this series of forty-two litholapaxies we have, then, but one death due to the condition of the urinary organs, and even that could not fairly be ascribed to the operation. Among the successful cases were several in which there was distinct evidence of an already existing interstitial nephritis, and yet the patients bore the operation well.

Case 3.—The third death occurred also in an old man (over 70 years of age), broken down by hard labor as a missionary in the tropics, who had just recovered from a severe illness on his voyage home. He had a small stone lodged in the prostatic sinus, which caused much pain with frequent micturition. This stone was removed by a median perineal incision and at the same time the third lobe of the prostate was divided with a probe-pointed bistoury. A drainage tube was fastened in. After doing well for a few days he gradually developed a septic condition of the wound which, in his enfeebled condition, proved fatal. This was the only case in the series of forty-seven, in which the fatal issue was distinctly the result of the operation.