Vesical Calculi
Their
Etiology, Symptomatology, Diagnosis, and Treatment
with special reference to their Treatment by means of
Injections into the Bladder

by
James Neilson
1862

"Touch not a cat, but a glove."
Introduction

The importance and frequency of these mortis partidas have from time immemorial attracted the attention, and called for the interference of medical men, and the ingenuity of each successive generation of the disciples of Aesculapius has been occupied with the hope of correcting the tendency to their deposit, palliating their evil effects, or simplifying the radical method of their cure. It is not my intention in the following remarks to discuss at any length the methods proposed for giving relief to the unhappy sufferer from vesical calculi, far too large to be taken up in the space in an extended manner within my limits, would be impossible. It is, however, my wish more especially to offer some observations upon a method of cure long since practiced, but at present almost entirely discarded. This is the most anxious wish of every practitioner, that Surgery should become more and more bloodless, and I do truly esteem this of our profession, that the method of Solun
-Aim of Science, by means of injections into
the bladder—should have been so much-
widely dismissed. How great a boon
to humanity were it if some of our modern
chemists were to solve such a question as
the following into consideration,—what is
the best solvent of Carbonic acid—and would it
not satisfy anyone, rather than pass their
brains for weeks and months in the hope
of discovering this member of the homolo-
gous series, or that Amine,—discoveries of
no advantage to suffering fellow-creatures,
and of as little use to medicine. Were the
method, on the trial of some few silent
sound worthy of adoption,—have great the
audacity added to the laments of surgery,
in saving miserable sufferers the necessity
of undergoing a grave operation, and the
lives of many from its too frequently
fatal effects. Too late it is, that hundreds
of our fellow-beings live on from youth to
age in inestimable misery. Laborious under
this cruel malady, afraid to place themselves
in the hands of a Surgeon,—so great the pa-
fability attendant upon the operations for its removal. Surely then any means that might be found as simple as, and less blindless than, the operations, the only in a proportion of cases, should be carefully examined and well tried.

**Vesical Calculi**

**Etiology.**—It is now generally conceded that renal or ammonium are the most frequent source of vesical calculi. In fact the formation of urinary calculi in the bladder is a rare occurrence, unless a foreign nucleus is present. These renal concretions descend into the bladder, and being retained, gradually increase in size from the deposit of fresh matter and throw off the nucleus. Their progress along the ureter may be either slow or rapid, and is marked by manifold and astonishing, boldness of both eminences, rising and great prostration of strength, which symptoms vanish on their entrance into the bladder. In many cases occurs, however, in which the nucleus is a foreign.
foreign body, introduced either intentionally or incidentally. Human teeth, pieces of cord, laces of various kinds, pieces of bone, pins, needles, straws, nails, and a great variety of other articles, have been found in the mucous of these deposits. Calculi may be single or numerous. Dr. Gross speaks of having found 54 in the bladder of an old gentleman, and Sir A. Cooper has extracted from one patient no less than 142. They may vary much in size, from that of a pin-head, to that of a large orange. Their chemical constitution seems to have some relation to their bulk, the uric acid & cystic calculi being always small, while those of the fusible species are generally large. When numerous, they must of necessity be small from the constant friction. They vary much, in consistence, the hardest being those of uric acid, the sofast the cystic type, and in form, being spherical, triangular, oval, oval, shaped, &c. on.
That age has an influence on the formation of stone, it can only be well established. In a table of 600 cases, more than half occurred before the age of 30, and it is doubted many of the calciui discovered in old age are formed in early youth, carried for many years before they give rise to symptoms so urgent as to demand the patient's attention, or send them to seek advice. In certain countries, calculi is much more frequent in children than in adults, and vice versa. It is even believed that the affection is occasionally intra-uterine. For my own part, I scarcely credit the idea. In fact, that I have been seem to prove that the disorder is hereditary, unless in families of the gouty diathesis, which certainly predisposes to the formation of calculi. Where many doubtless be certain external influences affecting a family, every member alike, and thus I think will account for the repeated occurrence of stone in one family. It is however an undeniable fact that the
Status in Society of patients exerts a mighty influence on the frequency of Calculi. Dr. Spurzheim also stated that for every patient in the higher walks of life out of one, fifty are met with among the lower orders. This is quite applicable, when we consider the derangement of the digestive organs engendered by the annihilation of indigestible food, of which they partake, the impure water they drink, their intemperance, deficiency of clothing and exposure to the vicissitudes of the weather. Such a combination of depressing influences cannot fail to produce the tendency to renal Acretions, or medical Calcoli.

Why Calculi occur more frequently in one country than another, is one of the questions attempted to be solved on every possible hypothesis, but in vain. We fear that it is quite rare in certain Tropical Countries, where, from the small amount of urine produced (so much water being exhaled by the skin) we should have expected...
expected to find them quite common. Dr. Boer, in the elaborate appendix to his
work on the urinary organs, tables up each of the supposed causes in connection with
climate and country. By comparing one
State (of America) with another, he
clearly demonstrates that no single one
of these causes can be relied on. Mean-
while in one state the disease was quite
unknown and in other was frequent, yet the climate,
water, food, and other supposed agencies,
were quite similar. So that the development
of stone, as affected by climate, food, and
water, remains a wholly conjectural matter.
What they do become as an influence, no
one would deny; but no one has ever
succeeded in determining its character
or the place each of these circumstances
has in the production of the disease. In
Nord and the inhabitants are prone to have
stone, but when they emigrate to some
new country they enjoy almost perfect
immunity from it. It is a matter of wonder
why the Dutch should be so afflicted.
when we consider the large use they make of their national & domestic drink - gin.

Serious occupations undoubtedly predispose to these diseases, the position of rest favouring deposition. Soldiers and Sailors seem to enjoy a special immunity from them. Sir James Boswell remarks

-ing that out of 340,000 patients, Soldiers in the Peninsula, — no case of Calculus was observed from December 1811 to June 1814, while Mr. Hutchinson states in reference to the Army, that for 16 years the disease only presented 8 cases.

Certain beverages have been accused of being causative of Stone, such as: Cherry

-ter, Russian Tea, &c.; but no proof has been forthcoming. Indeed the question

-ith of fluids & drinks (as Causis) is involved in much obscurity. Made for & taken

-ousness in diet may refer to the estab-

-ishment of the tendency by inducing dyspepsia. Certain foods in common use are by many authors considered causative. Thus the fact that stone is frequent in
in the sphere of their own observation, but we find, that in other districts the use is similar, & Calenium is rare, or altogether unknown. In a few cases an opinion, that indulgence in meat diet is a cause, from the formation of urinary acid, and many cases I think may be ascribed to this local bitterness. Some waters, and especially waters impregnated with some salts, have been charged with direct contamination, but no positive opinion can be formed on this point, as they are used as freely in non-calenium districts, as in those most obnoxious to the disorder. Dr. Spencer Thompson has I think proved, that malt liquors when cold or acid from the rare geis lithiasis, but I do not believe that good malt liquor is a cause, that he states the disease to be common among the men at the Barton-on-Great Precinct. The Rheumia wines are said to be anti-acidic from the Bikan Beale of Pithak clay, contain being converted into theCarbonate and acting as an alkali against
against the inconvenience.

Diseases of the Prostate Bladder, Uterus, Bladder and Kidneys are predisposing causes. In fact anything obstructing the flow of urine or working any change in its character may be looked upon as such.

Diseases of the Brain, or nerves supplying the lumbar organs are considered to be their formation.

Rheumatism also favours their deposit. Few observers seem to have investigated this interesting relation. From the remarks already made it will be seen what the etiology of arterial Calculus is not yet settled on anything like a satisfactory basis. It is futile to try to explain by any single one of these causes their formation. My impression is that no single one of them suffices to produce Calculus, but that it is rather a combination of such influences that is necessary. One almost among these agencies, I place exposure to the vicissitudes of the weather, calling forth the various action of the Kidneys.
Symptomsatology

The most general diagnostic signs of vesical calculus are the following; viz, 1st. Frequent micturition, the call being sudden and almost irresistible. It evidently depends upon increased sensibility of the neck of the bladder from the constant contact of the foreign body, and may be greatly appeased by the use of instruments in tumbling or by over-extension.

2nd. Great pain while making water; increased to an insufferable degree just as the last drops are being voided. The pain is of a burning character, and frequently causes retraction of the neck of the bladder, a feeling of numbness in the thighs.

3rd. Stoppage of the flow of urine, caused by the falling of the calculus against the neck of the bladder. This is generally one of the earliest symptoms. Occasionally the slightest change of posture will free the neck of the bladder from the inductor.

4th. A feeling of weight and uneasiness
easeiness in the Pelvic region.

5th. Itching in Blows Peris. generally commences early & leads the patient to grasp the organ firmly. It occurs most common in the young, their fingers being forced to press the organ with the constant wetting with urine.

6th. Internal urine, frequently not noticeable until the urine has stood for some time. It generally imprints a very peculiar odour to the urine, becoming decomposed.

7th. Bloody urine. This is not very common, but may be traced to roughness & increases upon laceration of some of the minute vessels ramifying on the mucous membrane.

8th. Incontinence of urine is not so frequently met with. Paralysis of the sphincter is the cause of this most unendurable symptom.

9th. Paralysis of Bowsel, especially in youth, from the excessive strain upon the Pelvic vessels while the patient
10. Sympathetic pains over Kidney, groin, abdomen and even in remote parts.

11. Other Symptoms have been noticed the only occasional, such as:

- Painful erections of Penis, emissions of Semen, etc. The Calculi, when more than one is present, have been heard strike against each other.

Diagnosis

Errors & grave errors must have been committed in this disease, by most accomplished Surgeons. Two most common diagnoses. Patients have been at first stone and no stone found; as cases do occur where almost all the physical, physicalinal Signs are simulated to perfection, in peculiar states of the bladder, and other pelvic viscera. When the Symptoms I have enumerated, in only the most important of them are present, we may feel almost confident that the patient is labours under Classical Calculus. But to make assurance
assurance doubly sure we make the intake
(So to Say, it speaks for itself). Therefore, before
receding to any active interference, we
pump the bladder by means of an in-
strument devised for the purpose—re-
ssembling a catheter, it is generally solid.
Even in this preliminary step great care
is required, as any rough use of the instru-
ment in an irritable patient may
cause complications of a serious kind.
Cystitis and a sympathetic derangement
of the kidney may follow, and fatal re-
results have ensued in more than one
case. The patient, if the constitution is
irritable, should be placed under antiph-
ogastic treatment with rest both before
and after the bulking; and chloroform should
be used in every case. A wash with Car-
domate of soda might be given with
benefit. In severe cases, while the bladder
is empty, it must be allowed to yet dis-
charged with urine. When the urine
has been inadvertently evacuated in-
jection of warm (boiled) water will am
- nor equally well. The patient is then placed recumbent, the instrument carefully introduced. The usual situation of a calculus being behind the prostate, that being the most dependent portion of the viscera, we saw the converse of the instrument in that direction. If the stone is not felt here, we move the instrument in different directions until the object is accomplished. When any resistance is met with, we move the instrument with a sharp stroke against the body, and if this is the calculus, a true metallic click is communicated. This is the most important of all the diagnostic signs. We also ascertain with Notable accuracy the size of the Stone, from the sound heard & the resistance offered.

One must however carefully guard against any sources of fallacy. Some of these are connected with the urinary organs, indurated fasciculi of the bladder, depositions of calcareous matter in annex and coat, enlarged stiffened prostate, and...
and morbid growths. A grating or rubbing sensation imparted to the hand skin to make us charge of forming a Borden opinion of the presence of stone, as any of these morbid states may give rise to it.

Much harm may be done by too frequent or too long continued pounding. Mr. Crosse of Norwich relates a case where death ensued "in consequence of persevering unsuccessful attempts to discover a stone with the pound." The idea of employing Auscultation in any way as a means of detecting stone is in my mind wanting of no confidence. New surgeons would dare to operate if no better evidence than that furnished by Auscultation could be got.

Error in diagnosis may be caused by morbid states of the other petrific viscera. Ulcers in the lower bowel, earthy concretions, or hardened bampartery noises may be a source of deception. Necrosis of the bones of pelvis may cause mistake. Mr. Crosse mentions a case in
in which an unusually projecting portion of the stone lies to rear. The original position of the stone has been frequently a source of fallacy, and in some cases the symptoms often simulate those of calculi with great exactitude.

Failure to detect a stone, even when such was present, has occurred frequently and to some of the most eminent physicians, even where there were more than one stone. This has happened, and in some circumstances may interfere with or prevent detection. The most usual of these circumstances is the small size of the stone, which many times escapes. Occasionally it may be enmeshed in the bladder in a pouch of the mucous coat, a very usual phenomenon in such cases, being behind the bladder. Cases are on record in which the calculus was coated with mucous, and necessarily failed to give the usual metallic chink in careful manipulation was made. Cimade mentions a case in which the prostate was so hollowed out by disease, that it concealed a stone of large size.
The disease may be simulated closely by an irritable state of the bladder. Much annoyance is often caused to persons when they meet with such cases, it becomes most embarrassing to young practitioners especially, because certain of their diagnoses. Disorders of the kidney, enlarged prostate, and ulceration of bladder may all give rise to symptoms similar to those of true stone. In females, again, ulceration or inflammation of the urethra can also intermingle with such symptoms.

Stone may exist for many years in the bladder and yet give rise to no symptoms, sufficient to draw and the patient's attention. Number of such cases are on record, in some of which the stone was of large size. This is explainable only from the fact that the calculus was generally from perfectly smooth, and on the supposition that the sensibility of the urinary membrane was greatly diminished.
Pathological effects

When opportunities ever present themselves for studying or examining past quarters, the effects of disease upon the bladder, just as the mucous plate of the tricus tend to the formation of calculus, so does the presence of the urinary product tend to the sympahtetic action and organic changes in the contiguous parts. 

The bladder itself may especially become the seat of curvus changes. Becoming intolerant of the ingredients, the muscular coat inflames, thickens, a granular state of the membrane is induced. But the irritation spreads itself to the other coats of the uroth, and one have it becoming hypertrophied, bindenated, while occasionally pustules are formed in the muscular fibres, in which the calculi may permanently lodge. Discharges of pus, blood, or mucus are not infrequently seen.

The action of the bladder is another effect generally met with in advanced life, and gives rise to most distressing symptoms.
Contraction of the Organ is infrequently happenings. In such an accident in some cases, that it will not and can as much as in one or two of these. The opposite state of this

Perforation of coitus into the Organ are occasionally observed from the time

becoming either wholly or partially disc-

charged. This almost always occurs in

the females from its position. But where

has escaped into the Vagina in the female,

into the Urethra or urethra, penis albus, 2
down into the groin. The Prostate, seminal,

membranes always sympathize with it

bladder, so the Calcinis may even become

lodge in these parts. The Rubinejo for

rarely escape, especially in protracted
cases. There may also be abscesses and

pustules in the Perineum, and from the

contagion and excitation. Draining in various

remit, then orchids operations of bowel

are not impregnent.

Suspension of the Cal-
In his Elements of Surgery, p. 333 relate the following case of a case of B. Colles's fracture, an uncommon fracture, which happened to him in practice. That the fracture is effected by the powerful contractions of the muscles and bones, as one may doubt, that such an occurrence can happen to take place without forming a fatal, I personally credit. That it should form a fatal is not strange, when we consider the aggregation of the already existing evil by the union of one of the broken angular edges of the Calamns.

Treatment

The treatment of Memorial Calamns resolves itself into two heads, medical and surgical, and shall now briefly consider each of them.

1. Medical Treatment

Many patients rather than submit to the risks and terrors of an operation, will determine to live on in unrelieved misery—bearing with its cause. It becomes us...
then to consider what we can or we have of alleviating them. Suffering, as affecting a cure, other than awaiting to die of it or distressingly. Such then may be done by attention to the general hygiene, to palliate their misery, and in many cases a cure can be effected by remedial medical means.

In many of palliation attempts to the poor, drudge, disease, may be of great value. It is not difficult to imagine why indigestible foods, intemperance or needless indulgence, should aggravate the symptoms. The diet should be plain and simple, easily digestible, yet nourishing. Wine, fermented liquors, & acid fruits, etc., should be abandoned. Exercise should be gentle, the clothing sufficient, and all locomotion exercise. Simple nourishment, and all luxuries, and all excitement, and all stimulants, avoided. The dissipation of the 

...
No drug on an equal basis, whatever the nature of the case or its symptoms, seems to be derived from alkaline drugs than from minims. The carbonate of soda or potash are the best. Alkales and alkali in any large or slight additional of in. Of changes with free carbonic acid, they seem even more advantageous. Moxon. Bize's and acid, indicates the phosphoric, vitriolic, and arsenic are preferable. Dr. Rosenthal states that he has found the alternate use of apis and alkali ansends well. Moreover, it is an inconspicuous fact that not only has the disease been rendered internal, but that many complaints have been effectually dissolved by such a course of treatment.

Alkali are very old and popular remedies for scurvy. The best physicians have prescribed them in this disorder. The treatment of it at Samuel Bowne, Dr. Stevens, which he sold to the Government, was found to consist essentially of egg shell lime and ordite soap, other successful cases were numerous. The preparation was essentially
part, and in large quantities. Lime water was afterwards substituted for egg shells. The effects of this practice in 1732 relate to the remarkable case of David Millar. This man had long been a martyr to all the symptoms of stone in the most aggravated form, and had tried many means of relief. As a dernier ressort he commenced to perspire in a case of Castile Soap — 2 feet daily, washed down with 3 parts of Lime water. He gradually improved, passed at different times fragments of calculi, and was at length entirely free from all his aches. The Alliabes were generally administered in large quantities of water. The Alliabes or Zanthodes of the Alliabes and were in such vogue. A diluted water is most useful in London, — a little per cup being added. Observe that Alliabes in whatever shape exhibited have undoubtedly a remarkable influence upon renal Calculi. The Commoner forms of these deposits may be disintegrated by their action. In addition, however, to their value as Lithotriptics, the Alliabes exercise a most beneficial effect.
effect as anodizes upon the bladder, and

Certain mineral waters have from a remote period been celebrated for their virtues against stone. It has been abundantly proved that their antinephritic has reduced many cal-

culi to a gelaclion masser—easily available. Those of Carlsbad, Banézes, Plombières, and especially those of Vichy, have great reput.

Their efficacy can almost solely depend on their alkaline constituents. But the Che-

valier have tested the powers of these waters.

Let me experiment suffice. "The half of a calcite and calc leading weighing 31, 31, 820.0 was placed in a bag of warm constant water-

subjected to the action of Vichy water for 137 hours. Having carefully & weighed after this the calcite was found reduced to 31; i.e., lost

90 of 17 less than a week; it had actually lost 15, 14, 97, or more than two-thirds of its original weight. The Vichy waters contain

a large quantity of pure CO₂ gas, having nearly 3 1/2 of 18 or carbonate of soda in every grain of the water. It is clear that these waters

and
act not merely as diluents but that they also exert some chemical influence.

Solutions by means of injections. The idea of dissolving alkalis in the bladder by means of injections is not a thing of yesterday. This long Priscus it was practised, and that successfully too. In Dr. Willis's work a quotation is given from the Medical and Philosophical Compendium of Dr. Deane, in 1775, being a communication from a friend of Dr. Deane, then travelling in Arabia Petraea. The quotation is as follows: "On the coast of Aqaba Petraea, beyond the mountains of Bohar, they have an effectual remedy for stone in the bladder. By means of a catheter they inject into the bladder a weak brine of alkali, washed with the purified fat of a sheep's tail, and a proper quantity of honey, all compounded together. The catheters are made of gold, and are introduced quite into the bladder, so that the composition is safely conveyed to the stone.
Some without ingesting any part "this plan of treatment, remarks Dr. Wells, "is reported as uniformly successful." In 1732 the celebrated Dr. Wells instituted experiments upon an arm dog by injecting into the bladder solutions which the hand proved decomposed of Calentli when out of the bladder. By means of his double-current catheter, on one occasion he could pass 900 cubic inches of water at blood-heat through the bladder of a dog in the course of 1 1/2 hours. He then tried the injection of solutions of Bicarbonate of Potash, Sulphate of Potash, and CaO, in water in the same way, and found he could pass large quantities without any symptoms of irritation. About this time also, the French chemist Dubreuil published an account of his method, in which he recommends the injection of Bicarbonate of Soda. In 1759, Dr. William Bisset, then a chaplain in the Edinburgh Royal Infirmary, commenced
a series of experiments with Bismuth under the Superintendence of Dr. Whytt, and invented an apparatus for its easy ingestion. Dr. Rutherford, the Clinical Physician to the E. R. Infirmary, tried its effects, according to Mr. Burnett's directions, upon one of his patients, who laboured under Stone.--The treatment being followed with complete success. The claims of such a method were strongly urged upon the Consideration of Medical men by Mr. Burgoyne and Pascalins of both the Royal Experiments. The latter says "The attempts, that have hitherto been made to dissolve Calculus in the bladder, have not answered expectation, but I am intimately per
anade it as they have not been repeated often enough to allow of those accidental circumstances which are never to be fore
seen, but which always occur (and oppose Process in every Branch) from being perfectly known, and either guarded against or vanquished." Mazzini and
Anmassakin France, C. Roedie & Willia

in England, have exerted themselves during this treatment more favorably on our account. Sir Benjamin's first experiment, in which he was successful, was treated with solution of nitric acid in the proportion of 3 to 1 into 2 parts of water. The injections used have been various. The nitrate of soda, the gastric juice of the lower animals, the arsenic barium of lead, amniotic acid, urine water, Barco water, and Vitriol water, have all been tried. No one seeks to deny that many cases have in this way been successfully treated, and I am strongly of the opinion that many — say 1 or 4 out of Alexander's first 2000 cases have thus blood lessingly removed. It is indeed very strange, considering the universal favor of the safety & success of such treatment, that the Annals of Syphilis should not contain one case of hundreds of cases by treated. I have to borrow the words of a medical man, we find it merely glanced at or altogether printed. Any proposal to treat 500 one by one, and silent and
Silent, is considered quite a chimera. In the face of Pathologies of successful Cases, Vingules well tell you that they have had no experience of it; or that they consider it too deterring and inconvenienc.

In doubt it has been tried by many without success, but I believe that either the treatment preparatory for the assigned in the resolution was either not and not or defective. Many among physicians, I am afraid, many of the members of the profession, have been, I am, too amiable to perform the brilliant operation of Lifting up, for giving any Certification to such simple treatment. But if its adoption can rid the unhappy patient of the endeavor, 1 have him the pain and risks of what too fatal operation.

But the triumph to surgery is all the greater. Objections to the method of discharging the Stone have been numerous, such as; the Pain occasioned, the inconvenience, the uncertainty of success, the occasional pain, and the danger.
Now I do not mean to affirm that every
case is suitable for the treatment by the
injection of Solvents, but that the
majority of cases is, I doubt not. The
Name required is the only valid objection
but with a proper Solvent this might
be materially lessened. The nurn-
resinene is a mythical objection
in my opinion, the apparatus used
can be uncomplicated & adjusted by
the patient himself, and the formation
of the use for an hour or so daily cannot
be any great inconvenience. As regards
the uncertainty of success that must
in a great measure have depended upon
the adaptability of the Solvent or enzyme
in the mode of its introduction. The
occasional pain might have been al-
-most entirely got rid of in greatly mitigates
by means of anaesthetics employed locally
or internally. ABlanger is seldom to be
apprehended if proper precaution is
taken, and is as a man might compared to
the risks of operation by Lithotomy.
It is not my intention to effec. Some re-
marks on what I consider the proper
method of effecting the removal of stone
by means of injections. Many of the
patients committed have been in the
utter neglect of any preparatory treat-
ment. The patients state of health being
carefully noted, due attention is to be
paid to the regulation of the bodily fun-
tions. The bowels should be kept free,
and demulcent drinks given to render
the urine bland. The food should be
restrictions but not over-eliminating.
Indulgence in all alcoholic or fermented
liquors immediately checked, and only
gentle laxatives prescribed. If the blader
is irritable, the Decoction of Aegus Beni
Carbonate of Soda or Nux Vomica will
be found beneficial. The Apparatus
being prepared, the stone should be evac-
uated and injections of Borphine water
after drops of Per. Borm. Borphine, or
some form of Opium, should be continued
for three or four days. The important
point
point now is what Polent is use. And if our Alma Mater, amids all her other advantages, could grant us some means of prosecuting investigations I can only mentally, I have no doubt the result would amply repay the trouble. But without the opportunity of making experimental research, we cannot (with so much certainty as otherwise would) speak authoritatively.

Again however let me repeat that I do not affirm that the solution of Polent is applicable to every case of Vesical Calculus, but to a number only. As I have already explained, among substances in solution have been tried. Premissing that the urine has been carefully tested, and the diagnosis of the patient correctly made out, I would recommend that in the cystic divers.
without Symptoms of diseaseness. It is also established that Petrih in Petrih dissolves into Lactic Acid Calculus when out of the bladder. The Phosphatic form of Calculus seems almost amenable to injec-
tions. Sir W. Barlow in his successful and endoscopic case used Petrih Acid of
the strength of 1 in 30 to the 1/3 of water.
One days after the operation was performed the liquid which has been employed as
an injection was tested by the addition
of a highly concentrated solution of pure
Ammonia & it was always found that of the Ammonia was added in a sufficient
but not too large a quantity the Phosphate
were precipitated in a mixture. The
patient suffered no material inconvenience
from the operation. It was continued
some times for 16 minutes - sometimes
for 1/2 an hour and repeated according
as the circumstances once in two, three or
four days. At least in mixing water
the patient up to two small Calenti
comprise of the Phosphate of Lime, with
A small proportion of the triple phosphate. It was impossible to doubt that it had been acted on disparately, disorganising the acid injection, and that they had at least come away by the intestines in consequence of this, having been thus reduced in size. But the Benhamin experiment succeeds, disorganising the digestive efforts, and that if his endeavors to follow up this investigation. Among many points, I am inclining to think, that if he had taken Phosphoric Acid, his conclusions would have been more favorable. We know that Phosphoric Acid is very irritating to animal tissues, even while greatly diluted, while Phosphoric Acid is an unequitable acid. In a paper entitled "Chemical of Animal Poisons" by members of the University, London, 1866, the following remarks from the late late member Dr. George Wilson, Professor of Chemistry. "It seems worth the consideration of chemists, whether Common Phosphoric Acid in any of its eminently active, in living tissues, and its poisonous action on animal tissues."

C. L. R.
Calculi, magnum, as a litholytic, he brought into direct with alcoholic solutions of the non-acid class, and render, in some cases, operations unnecessary. Again the phosphates are soluble, in an excess of water from acids, so that when the urine is treated with phosphates, the internal administration of a few drops of dilute phosphoric acid for two or three days renders the urine perfectly clear. Cases are on record where such treatment of calculi has been followed by a cure.

Everything I think goes to support the belief that if this acid were quinolinically injected, the results would be highly favourable. I have a strong opinion too, that even the very grating small-lying Calculi might be brought within the pale of solubility by means of this acid. As regards the other varieties of Calculi, I am persuaded that percussion efforts with this acid would be crowned with success. It is more than probable that the administration alcalions or
Acids (as indicated) lay the smooth surface
suns and the injections would ma-
materially assist in the solution. 10%
Mills suggests that this may probably
be a part of the treatment necessary
its success. At all events if they have
no effect on the stone itself they will
act as correctives of the tendency to its
various deposits. Moreover in numer-
ous cases recorded, where the use of
alkalis & acids by injection failed to
dissolve the calculi, they were
found highly beneficial as sedatives
of the inflammatory, and rendering the
foreign body completely harmless.

Mr. Baden remarks that

Chemists have been extremely ready to
pass judgment against the use of Al-
Rahies Baden internially in this disorder,
and thus on the face of the success
that has attended their administration.
Mr. Brander observes that Alvine Acid
Calunci are only soluble in caustic al-
Rahies, and that if the stone AlRahie be
safety by the mouth it reaches the bladder, in the state of Carbonate, and then an
imperceptible objection arises to their use, for he remarks that the Carbon-
ates of Potash & Soda have no effect
on Lithic Acid. Now, in the first place,
the internal use of the Alkalies is
corrective of the tendency to deposits,
and, secondly, experience proves that
weak solutions of Alkaline bicarbonates
act as certainly on Lithic Acid deposits
as the Puritic Alkalies. In 13, 13ride
and other eminent Physicians believing
as great a Chemist infallible adopted
without much Consideration (I fancy
his views, which I shall to be quite
irrelevant), and protest against the use
of Alkalies. Dr. Benjamin Rush at
after long use of these Substances, the
Phosphates begin to deposit to render
matters worse. On this point Dr. Willis
remarks: "The mind, that is depositing
the Phosphates habitually will in some
cases at least be rendered clear by the use
of
of bicarbonate of Potash in Water, es-
pecially if it be broken in water an-
alyzed with Carbonic Acid. I have
found the experience of Crenshaw to be
the case. Vichy waters, for, abound in
large quantity have the same effects.
Magnesia successfully precursors the
bicarbonate of Soda in deposits of triple
Phosphates. I do not therefore believe
that the phosphates are deposited in
consequence of the internal use of Alk-
alis — tho', in that diaphones, they
might be deposited in spite of their
influence. I cannot do better, in con-
elusion on this point, than quote
the following remarks of Dr. Willis:

"I see that it is not from mine render
Norbid by the Decomposition of its Salts
with insoluble bases, supposing it to
follow the use of Alkaline medicines,
that an emaciation in the rise of Calori
is to be apprehended. It is from mine having
little soluble Salts in a state apt to under-
go crystallisation, and crystallising
the
at the moment they meet with a point of support, that the successive layers of Calcoli are formed. If by means of a solution of Potash we saturate the Phosphoric Acid, and detach the Carbonic Acid of a quantity of fresh urine, that contains the Triple phosphate in abundance, instead of having beautiful limy transparent white and regularly-shaped crystals of this Substance formed, we have immediately an amorphous precipitate of magnesium oxide, two particles of which cannot by any one be made to adhere.

These, then, I believe to be the best potents of Mineral Calculus, and in the latter hope I may deem them largely used as such. I commend them to the careful consideration of medical men.

The Surgical Treatment.
The instruments and employed for the removal of Stone are: Lithotripsy, Lithotomy, Lithotom
Lithotripsy

No cirrhosis of Paris belongs the merit of introducing lithotripsy, his first success upon operation being performed in 1804 after four attempts. Many distinguished men followed in his footsteps, and with occasional, but not frequently fatal
success. The operation is now known on the name, and I cannot but admire
immoderately. The causes attending it are
many, its success doubtful, and the
mortality large. In the case of
Soares, in 1843, the mortality from the
operation as excessively small compared
with that from distillation, but I con-
jecture myself whether the results of his alleged
experiments, in his general table of statistics,
do not include the deaths of
patients on whom the operation had
been commenced, though not been
performed in, being found unsuitable.
Strange that in the hands of most
prominent men in this country to else-
where the mortality has been excessive

[Signature]

[Date]
compared with that of Mr. Chirnole, what
ever may be assigned as the cause,
Diphtheria does not meet with very
many adherents in this Country. Fail-
ures of Bases occur, in which the operation
might be found safe, but they are few.
It is not easy of death and while the risks
are so great, it is not my intention to
describe the instruments used in, or the
mode of performing the operation. The
dangers of a the mortality, from it, have
so my mind settle the question of its
justification. Its dangers are manifold,
and I content myself with enumer-
ating the more important of them:
1st. Impaction of debris in the si-
nutebra, which occurs once in every three
cases operated on, and produces, at times
only retention of urine, but far more
frequently inflammation, ulceration,
followed by irritative fever, and per-
chance death.

2nd. Obstruction of drainage passages
ending in Serosus memlbnum.
3rd. Rigors, and fever. Delirium not infrequently sets in. The patient has fallen occasionally into a state of collapse, from which he comovers.  

4th. Retention of urine from the shock received by the bladder, or contusion received by the urethra.

5th. Haemorrhage. The blood may either come from the urethra, prostate, or bladder, and may be profuse enough to endanger the patient's life. Blood may coagulate in the bladder, and from a pooling in the fragments of calculus, and thus prevent the proper clearing out of the calculi. I have no doubt many cases of relapse are attributable to this cause.  

6th. Phthisis. This is one of the worst of the bad effects, and is generally rapidly fatal.

7th. Peritonitis, followed by Syphilitic Symptoms & death. This accident is not so rare as is asserted.

8th. Colitis - nearly always fatal.
fetal. The veins of the Pelvis are frequently found inflamed and abscesses form around the neck of the bladder.

9. Perforation of bladder has been known to occur.

10. Aggravation of any previously existing renal disorder, a damns matter and of frequent occurrence.

11. The treatment of relapse after distruption of very interesting. Peason to have almost entirely neglected by most writers on the subject. Dr. Cireale, the champion of the operation, is the only one indeed who has looked at the matter. In practice, in 548 cases, relapse occurred in 35, a proportion of 1 to 10, while we know that in blotting the proportion of relapse is only about 1 in 60. Mr. Alvis is a personal chemist, and affords strong argument against the operation. A most admirable case of this kind is recorded by Mr. Contoun, in which the operation was performed for fifty-eight times. Now many bladders end.
embarrassing and such active interference?  
The operation of Lithotomy is
undoubtedly a very fatal one. Mr. Vulpian,
who analyzed the Statistics of Mr. Enucle’s
earlier cases, shows that this great advocate
of the operation lost about one in every
four patients. But setting aside Mr.
Vulpian’s Statistics, I think from the mortality
from Lithotomy will be found about
one in four—one in four—which is much greater
than that of Lithotomy. Some authors
assert that it is even higher.

Yielding therefore into consi-
deration the frequent manipulation
required, the dangers of, and the mor-
ality from, the operation, it is no
matter of wonder that it should be
gradually waning. Let its greatest ad-

Lithotomy
Lithotomy

No one can account of all the various methods of performing Lithotomy as practiced by different Surgeons in different ages, would be an endless task. I shall therefore content myself with a short summary of the operations, as performed by modern Surgeons. We do not intend either to describe the instruments that have been used in their performance. Let me again repeat that while I consider the operation quite legitimate, I believe we have means, which if practiced would in many cases render it unnecessary. And again, I cannot but think that if Surgeons were to be more careful in the preparatory and after-treatment, we would have a much less mortality from it.

Lateral Operation

Pyram. Perineal & Infra-Pubic. This is the operation, par excellence, of the present day, and is performed by making an incision on the left side of the penis.
-gum, extending from the skin through the vessels of the bladder & Prostate gland, and thus in a manner extracting the calculus. The Knife in its course divides the skin, superficial fascia, posterior haemorrhoidal vessels & nerve, the posterior fibres of the accelerator nerves, transversus perinei muscle & ling, the deep perineal fascia, the anterior fibres of the Levator ani muscle, part of the compressor urethrae, the membranae & prostatic portions of the urethra, and part of the Prostate.

The preparatory treatment that consist of regulation of the bowels, emptying of the bladder of urinated, and administration of an astringent & render the urine less acid.

The Parts to be avoided are: - the Mill of Corpus Urethrae, rectum, pudic or anling, & ling of Bull's if the incisions are carried too far back, and the Prostate may be divided too great an extent. Of this we must ask will
will assume to have infiltration of some behind the Pelvic fascia, and the cellular fascia between rectum and bladder. And Penile veins and subsequently set up. The risks of the operation are also too many, and I shall only mention a few of the most important.

1st Haemorrhage. This may either be arterial or venous, and may be primary or secondary i.e. during the operation or after it, and may be slight or severe enough to produce fatal consequences. The causes of it may be:

- Arterial or bullet, superficial perineal artery, and occasionally the Pudie if the operator is careless, or if that vessel arises directly from the internal iliac and passes forward to penis over the side of the Prostate gland. The vesical veins or prostatic plexus may also be a cause.

2nd Infiltration of Same by the free division of the Prostate is a most fatal mishap, Asphoic symptoms rapidly supervening.
9th. Peritonitis, always appearing before 12 hours have elapsed, and generally terminating fatally by 3rd day. The causes may be infiltration of urine, or inflammation lodg'd in the bladder.

1st. The shock the system receives from the operation may be great, and the patient may sink in 3-4 hours.

3rd. Nausea or vomiting supervene, as an effect of the peritoneal discharge.

4th. Constipation often ensues. Care should be taken to use all gentleness in manipulation and accommodate this.

5th. In inverted constipation, empurpels are among those.

8th. Fistulae may result either from the wound not closing throughly, or from wounds of the rectum.

9th. Affection of a previously existing disease. So long as the urine remains in the bladder, the other disease may keep latent, but on its removal the disease breaks forth with great intensity, and frequently runs a rap...
In fatal cases, the kidneys are the organs most apt to suffer in this manner. In these instances, there is often found, in addition to other organs, a termination fatal. In many instances, the surgeon satisfies himself that the operation is contra-indicated by the presence of some organic disease, and the misfortune is, that we cannot always form a correct state of the various organs, or the stage of the disease. It ever and anon meets with one of these un-looked-for occurrences in his practice, when the cause of death was the bursting of an abscess in the right kidney, or the escape of its contents into the general peritoneal cavity. Other less severe occur, such as incontinence of urine, impotence, &c; but let these suffice.

Mortality from Lithotomy were, as in many other diseases, great difficulty is experienced in the collection of statistical results. The mortality in the hands of different surgeons...
-varies much. Thirty, forty, or even more. Cases of cure may follow in succession, and then often, the surgeon may lose one patient in every three or so. Crosse states that 38 patients successively operated on in the Norwich Infirmary recovered, the average mortality in that institution is about 1 in 7. Mr. Dixon lost one in 7, Cheesden one in 13, and Bosanquet of Flimlee one in 17. In the Hotel-Dieu, Paris, the mortality averages one in 4 1/2 in St. Chausse one in 2 4/13. Therefore, however, I am correct in stating that in the general practice of Surgery in this country the mortality is one in 5 or 6. Age has much influence on the results of Lethargy. Children recover far more readily from the effects of the operation than adults. In Cheesden's practice from the age of 1 to 10 years the average mortality was 1 in 3 3/7 from 30 to 70 years 1 in 5 5/9 from 70 to 80 years 1 in 2. The size of the calculus also influences the mortality. For when the Stone
Stone is very scarce or under the proportion of deaths is 1 in 11; when 2-3 ounces 1 in 2 3/8; and when 4-6 ounces 1 in 1 3/8.

Relapse after Lithotomy is rare seeming as I have said almost once in 60 cases.

No statistics can be found relative to the causes of death after Lithotomy, unless those of Dupuytren, but his results apply only to the bilateral operation. It seems from his tables, that infiltration of urino into the cellular tissue of the Pelvis was the principal cause; the next, being great size of calyceus; the third, Hemorrhage.

Bilateral Operation

Dupuytren was the great advocate of this mode of operating and practiced it first successfully in 1824. It consists in division of the Bladder and Prostate gland on both sides. He advocates it on account that it is better fitted for the removal of large calyceus; that there is less danger of wounding the Pelvis fascia; that it is applicable to both sexes at all
all ages, that its performance is easy, and that it becomes the permanent antiseptic, reckoning seminal ducts from all harm. But these gentlemen have drawn to brilliancy a procedure prominent for gemstones have found the lateral operation as easy of locomotion of far more safe, at any rate in its extremity than the bilateral. The only advantage it seems to me to possess is the greater amount of room gained for the passage of the calculus. Mr. Leckon thought it only time to divide the opposite side of the prostate, when he found it necessary. As regards the results, we find on a close examination of Dupuytren's practice that he kept only favorable cases to himself, sending the rejected cases to his colleagues, but yet his mortality was 1 in 17, and if we exclude children, and female adults from 20 to 40 years of age, we find he lost exactly one half of his patients, certainly not a favorable result.
Recto-Vesical Operation.

Mr. Sanson, a colleague of Dupuytren, first, in 1810, introduced this operation. Dupuytren warmly espoused the idea, and pronounced it easy, quick, and the least dangerous of any method, but other Surgeons found it had not the advantages claimed for it. Experience showed that the chances of a fistula, after five remaining were great; that suppuration of the Periurethral tissue often occurs, and that the terminal vesicles and ejaculatory ducts are frequently wounded. The mortality as far as I can ascertain from statistics is about 1 in 5. Mr. Velpman states, that out of about 100 operations of this kind, "we count about 20 deaths, the same number of fistulas, and a variety of accidents, which endangered the lives of some of the patients." In all those cases many however occur rendering this method of operating necessary. The Author narrates the particulars of a case where a large...
calculus was excised in the posterior part of the bladder, and bulged into the peritoneum, and was removed by incision through the corresponding portion of the bowel. Again if the stone was impacted in one of the bursae, the foreign body would be more accessible by the recto-vesical, than by the perineal incision.

Suproa—Pubic Operation. This operation consists, as its title implies, in opening into the bladder above the Pubis. The great drawback to its safety is the close proximity of the Vesicæ to the Peritoneum. It is not such an easy matter, either in many cases, to get or keep the portion of bladder, under the Peritoneum, above the Pubis. The advantages of the operation are 1. That is free from Haemorrhage. 2. That there is no risk of inflammation of the Cervix Vesicae, and 3. That the peritoneum for a long period are free from harm. The obstacles to the operation are not without weight.
1st. The patient's abdomen may be loaded with fat, rendering the distance from the surface of the body to the cavity of the bladder too great for easy manipulation, and the presence of the stone a matter of much difficulty.

2nd. The bladder may be inadmissible from the presence of Calculus, consequently contracted so that it is situated low down in the pelvis, while the portion within reach is covered by Peritoneum.

3rd. From the direction of the incision it is difficult to seize and extract the stone.

The accidents connected with this operation are: Injury of the Peritoneum and Infiltration of Urine. Injury of the Peritoneum is not necessarily fatal. Should infiltration of urine however follow the injury, intense inflammation is sure to supervene, and a fatal termination rapidly follows. Abscesses from infiltration frequently form, serous mischief results, and peritonitis may rapidly set in, if the matter is not allowed means of
of escape. But, even under most advantageous circumstances, the operation has never answered expectations. Statistics prove that one in every four operated on are lost. Dr. Sunderland of Paris, the champion of this operation, with all his precautions loses one patient in every 3½. Chevalier says he only lost 1 in 9, but he also tells us that he excludes 9 cases, which proved fatal from wound of the Peri-

In conclusion, I am well aware of the imperfections of my trial to call attention to the old method of Solution by injections, or to give anything like a correct de-

of the various operations for the relief of stone in the bladder. If, however, by my humble efforts, I can excite any curiosity in the matter, I shall be well satisfied. My anxious wish that surgeons will again investigate the subject of

Solution.
solution of stone with vigour & Chemist-
-ry lend a helping hand. The subject
is worthy of further attention; its
importance demands no superficial
investigation. I have every confidence
that even now we possess means of
preventing the necessity of operative
interference in many cases. With
strict attention to the rules prescribed
and perseverance in the use of the re-
medies, problem of, my conviction
is that in a majority of cases, obe-
-sical Calculi may be either entirely
dissolved or so much reduced in bulk
that they may be avoided by the
anesthesia, and thus much suffering,
pain, and death be avoided. Sincerely
I trust that as years roll on, this treat-
ment will preclude the necessity
of using the Knife, and, adding bruise
To the Cannels of Spleeny, confer a
mighty benefit on mankind.

Finis