

Randolph (G.)

ACCOUNT

OF

SIX CASES

OF

STONE IN THE BLADDER,

IN WHICH THE

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LITHOTRIPSY

WAS

SUCCESSFULLY PERFORMED.

By **J. RANDOLPH, M. D.**

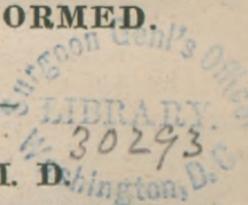
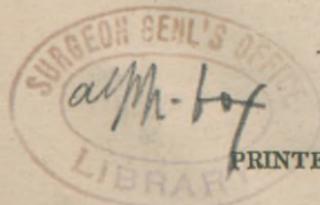
ONE OF THE SURGEONS TO THE PHILADELPHIA ALMS-HOUSE INFIRMARY.

[Extracted from the American Journal of the Medical Sciences for November, 1834.]

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A DEGREE of surprise will probably be excited in the minds of some who read this paper, at my having so long delayed giving an account of the following cases, but I have been actuated by two motives in withholding their publication; in the first place, I wished that a sufficient length of time should elapse to test fairly and fully the results of the operations, and in the second place, the several cases presented themselves so simultaneously, that I was unwilling

* Baron Heurteloup, who has obtained the most triumphant success in the destruction of calculi in the bladder by means of percussion, effected through the agency of an instrument invented by himself, which he calls "Le Percuteur courbe a Marteau," has adopted, and I think with great propriety, the term lithotripsy in preference to that of lithotriety. He says, "*Lithotripsie* veut dire pulvérisation de la pierre, de λίθος pierre et de τριψω, je pulvériser, τριψις, pulvérisation; il indique conséquemment le but général de l'opération, sans indication d'aucun procédé. Il n'en est pas de même du mot *lithotritie*, qui n'a jamais désigné que le procédé détruire la pierre par des perforations répétées; en effet, il est dérivé de λίθος pierre et de τριτρώω ou τριρω, je perce. On sent bien que l'on ne peut pas appeler *lithotritie* l'action d'un instrument qui écrase les pierres ou celle qui les brise par la percussion. En un mot, la *lithotripsie* est le nom donné à la méthode prise en général, qui consiste à pulvériser les pierres, et le mot *lithotritie* n'indique que le procédé de perforer successivement les pierres pour les détruire. *Lithotripsie* est le genre, *lithotritie* est l'espèce."

to give an account of one until the whole were completed. Had I, in truth, consulted merely my own feelings, it is probable that I should not even, at this period, have consented to the publication of this brief outline of the cases: to this step I confess I have been principally induced by the advice of my valued friend, the editor of this Journal, who urged that the alleged success of the operations might be called in question unless an authentic report of them were made to the profession. I am well aware, indeed, that it has been stated, both publicly and privately, much to the opprobrium of American surgeons, that the operation of lithotripsy has never been successfully performed in this country; facts, however, are *stubborna* things, and the following will, I trust, furnish a sufficient refutation to all such rash assertions.

CASE I. The first patient on whom I performed the operation of lithotripsy was Augustien, a French cook, aged fifty years, placed under my care by my friend, Dr. R. LA ROCHE. Augustien had been afflicted with the symptoms of stone for about three years; had suffered at times very severely, and was seldom able to retain his urine for a longer period than from ten to fifteen minutes.

Having properly prepared this patient for the operation, by the introduction of straight sounds into the bladder, not only for the purpose of accustoming the parts to the presence of instruments, but also to ascertain the exact situation of the stone, on the 22d of September, 1832, I distended his bladder with barley water, and introduced into it the cannula containing the three-branched forceps and drill of M. CIVIALE, (called lithotriteur,) in the presence of Drs. HORNER and LA ROCHE, and Messrs. PILE and COOKE.

The instrument passed readily into the bladder, and immediately came in contact with the stone; I now protruded the blades of the forceps, and succeeded in catching the stone without the slightest difficulty; I next put the drill into motion by means of the bow, and perforated the stone in a very short time; its diameter appeared to be about two inches. It was now deemed proper to desist for the present; I accordingly liberated the stone, closed the blades of the forceps, and withdrew the instrument.

The patient did not suffer severe pain from this operation, which occupied fifteen minutes.

Upon withdrawing the instrument, a considerable portion of calculous matter came away with it; this was quite soft, and was found subsequently to be composed of the phosphate of lime; the same sandy matter also escaped after the operation along with the fluid and urine which he voided.

On the 29th of September I again introduced the instrument in the presence of Drs. **PHYSICK**, **HORNER**, and **LA ROCHE**, and Messrs. **PILE** and **COOKE**. Having, as on the former occasion, succeeded in catching the stone without difficulty, I drilled a hole through it, which I soon perceived to communicate with the aperture made at the first operation.

My next object was to turn the stone, which was accomplished with some slight difficulty, and another perforation was made through it. I now removed the instrument from the bladder, but experienced considerable embarrassment in doing this in consequence of the fine, soft sand mixed with the mucus forming a kind of mortar, which insinuated itself between the blades of the forceps and the drill, and adhered to them in such a manner as to prevent the blades from closing as completely as they ought to have done.

Soon after the operation the patient took a warm bath, and voided the fluid contained in his bladder, together with a considerable quantity of calculous matter.

From this period fragments of the stone continued to be voided for several days, and some of these were of considerable size, showing evidently that the stone was very much broken.

On the 13th of October I repeated the operation in the presence of Drs. **PHYSICK**, **HORNER**, **LA ROCHE**, and **W. RUSH**, and Messrs. **PILE** and **COOKE**. On this occasion I used an instrument one size smaller than the one before employed, immediately caught the stone and bored a hole quite through it; I then attempted to change the position of the stone without letting it go from the forceps; this however I could not effect: I now expanded the blades of the forceps and liberated the stone, then placed the patient on his left side and caught the stone and drilled a hole through it which communicated with other apertures and seemed to break it up considerably. I now again liberated the stone and placed the patient on his right side, then caught it and made another perforation through it with the same effect.

It was now deemed proper to desist, the time occupied by this operation being about twenty minutes. Soon after removing the instrument, the patient voided the fluid which had been injected into his bladder, and with it a good deal of calculous matter. In the evening he had some fever, which however passed off in the night by perspiration. The fragments of stone voided after this operation exceeded much in quantity that passed off after the two first operations.

On the 16th he had a slight chill, which was followed by some fever and pain in the back; these symptoms yielded to two bleedings and a cathartic.

The fourth operation was performed on the 31st of October, in the presence of Drs. Horner and Rush, and Messrs. Pile and Cooke. I caught the stone very readily and made several perforations through it. He suffered very little from this operation; the instrument was introduced and withdrawn without causing any irritation; soon after it he took a warm bath and voided a considerable portion of calculous matter.

Being fully satisfied from the quantity of stone collected after these several operations, and from its measurement by the forceps, that the remaining fragment was of small size, I endeavoured very carefully at this last operation to crush the fragment into pieces by means of the forceps; this attempt however did not prove effectual.

I now determined to make trial of the instrument invented by Mr. JACOBSON, of Copenhagen, for the purpose of breaking up a stone in the bladder, and accordingly on the 7th of November I introduced this instrument into the bladder in the presence of Dr. Horner and Mr. Cooke, and succeeded in a few minutes in catching the stone and breaking it into pieces. Upon withdrawing this instrument, which subsequent experience has induced me to consider one of the most valuable and important ever invented for surgical purposes, I had the satisfaction to find that its blades were completely filled with the calculous matter. The fragments continued to be discharged for several days after this operation; one piece of rather large size lodged in the urethra for near thirty-six hours, it did not however occasion sufficient irritation to induce me to make any great effort either to push it back into the bladder, or to break it in the urethra; it was finally discharged, and the patient then expressed himself free from all pain of the stone.

From this period the patient rested well at night, and was able to retain his urine for five or six hours; this fluid also which previously to the operations was exceedingly turbid and mixed with a considerable quantity of mucus, now became perfectly transparent and clear. Having subjected the bladder to a careful examination, and having sounded it repeatedly without detecting any particle of stone remaining, this case was reported cured on the 26th of November.

It is proper I should state that four or five months subsequently to this period, Augustien again called upon me labouring under some of the symptoms of stone; I lost no time in introducing a sound into his bladder, and ascertained that there was a fragment within it; I introduced Jacobson's instrument twice, caught the piece immediately, and crushed it completely.

These operations did not occupy more than a minute, and were

not productive of any irritation; he passed out the fragments in a few days, since when he has enjoyed good health, and attends to his ordinary concerns.

CASE II. Early in November, 1832, I was requested by Dr. Physick to take charge of the case of Mrs. F. D. of Virginia, aged about twenty-seven years, wife of Col. D. Mrs. D. had been afflicted with the ordinary symptoms of stone for fourteen years. Soon after she arrived in this city Dr. Physick sounded her, and ascertained that there was a calculus of large size in the bladder.

In consequence of her protracted and severe sufferings, Mrs. D. was at this period much emaciated and exceedingly nervous. So great, indeed, was the prostration of her system, that upon the day appointed for my first essay, Dr. Physick considered her to be too feeble to bear any attempt to be made to break the stone.

Having by proper restoratives imparted more tone to her system, I commenced the operation on the 16th of November, in the presence of Dr. Physick.

The irritability of the bladder in this instance was so great, that the patient could not bear any fluid to be injected into it, and accordingly, without resorting to this expedient, I introduced the three-branched forceps of M. Civiale, and having expanded its blades, after considerable difficulty, I could only succeed in catching hold of a projecting portion of the stone; I next put the drill into motion, and bored a hole, which only extended partially through the stone. Upon withdrawing the instrument, we ascertained that the stone was very soft, and I was now convinced that it was too large to be embraced by the forceps. Being provided with Jacobson's instrument, I next introduced this into the bladder, and succeeded in breaking off, from the sides of the stone, a considerable portion of calculous matter. This instrument was introduced and withdrawn without producing any pain; soon after the operation, which occupied only a few minutes, Mrs. D. voided large quantities of the stone, and continued to do so for five or six days; the amount collected seemed indeed sufficient of itself to constitute a calculus of tolerable size. From this period she recovered her health and spirits to a very great degree, and there was also a considerable abatement of the painful symptoms of her disorder.

On the 26th of November I again introduced the instrument of Civiale in the presence of Dr. Physick. In a very short time I caught the stone and drilled a hole completely through it; I then expanded the blades of the forceps slightly, loosened the stone, changed its position, and made another perforation through it. I next endeavoured

to break up the stone as much as possible, by pulling forcibly at the blades with the view of compressing them. It being now thought proper to desist for the present, I let the stone go and attempted to take out the instrument; here however I met with the same difficulty I experienced in Augustien's case, on account of the soft stone adhering like mortar to the sides of the drill and forceps, and preventing the blades from closing entirely. This part of the operation caused considerable pain; when the instrument came out it brought with it a large quantity of sandy matter. Soon after the operation, Mrs. D. took a warm bath and passed a good deal of stone; she rested well at night, and the next day felt freer from pain than she had been for a long time. Mrs. D. continued to void calculous matter for five or six days after this operation, during which time her general health also improved considerably.

On the 15th of December I again introduced the lithotripteur, and caught the stone, which proved to be much lessened in size. I made one perforation through it and then let it go, withdrew this instrument and introduced Jacobson's, and broke the calculus up, as I thought, completely. Mrs. D. did not suffer the least pain either during or after this operation; she voided the calculous matter as on the former occasions.

Upon examining the bladder, however, four or five days subsequently to this operation, I ascertained that there was a portion of stone remaining too large to pass through the urethra.

On the 25th of December I introduced Jacobson's instrument, and caught the stone instantly and broke it, and caught it again and broke it; after this Mrs. D. passed out several large fragments which caused a good deal of straining, and on the 5th day a hæmorrhage occurred. The bleeding was stopped by keeping her perfectly still in a recumbent posture, making cool applications to the vulva, and drawing off the urine by means of a catheter, besides which she drank cool alum whey. From this period Mrs. D.'s sufferings were almost entirely relieved; it was found, however, upon examination, that a fragment was still in the bladder; for the purpose of destroying which I was obliged to make use of Jacobson's instrument twice in the month of January, 1833.

It should be stated, however, that the patient was exceedingly delicate and nervous, and that she would not submit to a repetition of the operations until a long interval had elapsed between them, and then for not more than two or three minutes at a time; in this way her cure was very considerably procrastinated.

During the month of February Mrs. D.'s health improved very ra-

pidly, and the symptoms of stone were so completely relieved that she was unwilling to believe she was not perfectly cured; I ascertained, however, that there was still a fragment in the bladder, though of so small a size that it required some time to find it with the sound. The patient would not submit to any operation for the removal of this fragment until the 27th of this month, when I introduced Jacobson's instrument, and caught the fragment, and drew it out almost entire in the blades of the instrument; but a small portion broke off, which was subsequently voided during the night. From this date the symptoms of stone entirely ceased; I examined the bladder very carefully without being able to discover the least particle of stone: Dr. Physick also made a very minute examination, and declared himself quite satisfied with the cure.

Early in March Mrs. D. returned to Virginia with her family.

About ten months subsequently to this period Mrs. D. again came to this city labouring under pain and difficulty in voiding urine; considerable apprehension was expressed by several of my medical friends lest there should be a return of the disorder. Upon sounding the bladder, however, very carefully, I had the gratification to find that it was quite sound and entirely free from stone; the examination of the bladder did not cause the slightest pain, at the same time the nature of her complaint was rendered very apparent; she was affected with a prolapsus uteri to a great extent.

For the management of this latter affection she was referred to my excellent friend Dr. DEWEES, by whose judicious treatment she was soon so much relieved as to be enabled to return to her home.

CASE III. Early in March, 1833, I was applied to by Mrs. M. H. aged twenty-eight years, who had been afflicted with the symptoms of stone for about three years.

Having carefully sounded this patient, and ascertained that there was a stone in the bladder, of not a very large size, on the 16th of March I introduced the lithotripteur of M. Civiale, and having expanded the blades of the forceps I made the most careful efforts to catch the stone. Notwithstanding however the greatest care possible was used during this essay, which occupied fifteen minutes, I could not succeed in seizing the calculus, and accordingly was obliged to desist.

The patient declared that she did not suffer the slightest inconvenience from these attempts.

Having failed in catching the stone with the three-branched forceps, on the 20th of March I introduced the brise-pierre articulé of Mr. Jacobson, and after a few minutes I caught the stone and broke off

several fragments which were discharged from the bladder in the course of the next two days.

On the 25th of March I again introduced this instrument into the bladder, and caught the stone and broke it into several fragments, some of these were passed out with the urine, and others I took out from the urethra by means of my common pocket forceps.

On the 28th inst. I again caught the stone and broke it, after which fragments were discharged during the days of the 29th and 30th, and on the 31st of March the whole remaining portion came away. From that moment the symptoms of stone entirely ceased, and the patient declared she was perfectly cured. I was quite satisfied of this being the fact, inasmuch as the fragments collected, when put together, formed an almost entire stone of oval shape, its longest diameter being one inch. I now however sounded the bladder very carefully, but could not detect any stone; a few days subsequently Dr. Physick also had the kindness to sound her, and declared his conviction that the calculus was all removed.

It may be remarked that the treatment of this case occupied but two weeks, during which time the patient was not confined to her bed for a single hour, but continued to attend to the affairs of her house as usual.

CASE IV. The Rev. Dr. Joseph Caldwell, of Raleigh, N. C. aged about sixty years, arrived in this city in the latter end of April, 1833, labouring under the symptoms of stone in the bladder.

Dr. C. had been afflicted with these symptoms for six years, and the pain attending the voiding of his urine was so great that he had been in the habit for a long time of drawing it off by means of a catheter.

Having prepared this patient for the operation of lithotripsy in the usual manner, on the 19th of May I introduced the lithotriteur into his bladder, without the least difficulty, in the presence of Drs. PHYSICK and HORNER and MESSRS. KENNEDY, COOKE and HENN. In a few moments I succeeded in catching the stone, and drilled a hole through it; I then expanded the forceps and let the stone escape, and caught it again and made another perforation through it.

The instrument was now withdrawn, and with it came away a quantity of sandy matter. The result of this operation proved that the calculus was a soft one, and not very large, its diameter being by measurement rather more than one inch. Dr. C. did not experience any inconvenience from this operation, which occupied twenty minutes; the next day he was about as well as usual.

On the 26th of May I again introduced the lithotriteur into his bladder; on this occasion I caught the stone three several times, and made perforations through it without any difficulty. The patient did

not suffer any irritation or pain from this operation, he continued to be up and about his room as usual, and for several days voided along with his urine fine calculous matter.

On the second of June I repeated the operation; on this occasion I could not succeed in drilling more than two holes through the stone. The instrument did not work as free in the bladder as it had done on the two former occasions. This operation however did not cause the patient any inconvenience, he was not confined at all to his bed, it was not followed by any fever, and he passed his urine more freely and also the sandy matter.

On the sixteenth of June I again performed the operation; on this occasion I made two perforations through the stone, and by pulling the forceps forcibly, I succeeded in partially breaking it. No inconvenience followed this operation, and he passed out a larger quantity of fragments.

On the 23d of June I introduced the *brise-pierre articulé* of Mr. Jacobson into the bladder, soon caught the stone, and broke it into pieces without any difficulty. The patient did not suffer any pain from this operation; on the contrary, in a few days he passed out the fragments, and experienced entire relief from the painful symptoms which he had formerly endured. Having examined the bladder several times very carefully after this operation, and not being able to detect any stone in it, I requested Dr. Physick to make an examination, which he did on the 4th of July, and after sounding the bladder carefully, he expressed his belief that the patient was cured.

On the 16th of July Dr. Caldwell left this city to return home, previous to which he addressed the following letter to Mr. Charles A. Poulson, one of the Editors of the American Daily Advertiser.

DEAR SIR,

In reply to your inquiries respecting my complaint, and the treatment for its removal, I will briefly state, that I had been afflicted with the symptoms of stone in the bladder for about six years. For the last three years these symptoms had occasioned me so much pain and distress, that I determined to visit Philadelphia, in order to seek for medical assistance, and obtain, if possible, relief from his terrible malady.

I arrived in the city in the latter end of April, and immediately called upon Dr. Physick, who having ascertained by sounding, that a stone was actually in my bladder, advised me to put myself under the care of his son-in-law, Dr. J. Randolph, giving me the assurance that Dr. Randolph had succeeded in several instances in effecting a perfect cure of this complaint by removing the stone, by means of the operation called "*lithotrixy*," in which case the knife is not at all used. This operation, I am told, is now most successfully and almost universally employed in Paris. I cheerfully acquiesced in this advice of Dr. Physick, a name I must think no less illustrious for benevolence, than for eminence in medical science and practical skill. Dr. Randolph took charge of my case, and

having properly prepared me for the operation, he commenced it on the 19th of May, in the presence of Drs. Physick and Horner, Messrs. Kennedy, Cook, and Henn. The pain which I endured from the operation was not severe, nor did either of the necessary repetitions of it occasion me so much inconvenience as to oblige me to keep my bed for more than a few hours. On the 23d of June Dr. Randolph performed the last operation, which occupied but a few minutes. A few days from this time I found myself free from the pain which I had previously suffered. The Dr. now examined me very carefully, and declared his conviction that I was entirely rid of the stone, and I had the heartfelt gratification of having this declaration confirmed by Dr. Physick, who, after a minute examination on the 4th of July, stated his belief that I was completely cured.

I am yours, very respectfully,

JOS. CALDWELL.

Philadelphia, July 10th, 1833.

It was with sincere regret I heard a few days since, indirectly, that the Rev. Dr. Caldwell was again labouring under some painful symptoms of affection of the bladder; I cannot of course say what the precise nature of his complaint may be; should it however prove to be stone, I feel quite convinced that one or two applications of the brise-pierre would be sufficient to destroy it.

CASE V. Mr. F. G. a highly respectable merchant of this city, aged sixty-four years, had experienced for a period of near thirty years, considerable uneasiness in the urinary organs; within the last four years the painful symptoms were aggravated to such an extent, that in June, 1833, he was induced to consult Dr. Physick, who, upon sounding him, ascertained the existence of a stone in the bladder, and had the kindness to place him under my charge.

Upon examination I discovered that his urethra was unusually small; the bladder also was very much contracted and irritable; he seldom was able to void at one time more than a large wine-glassful of urine.

I attempted to inject barley water into his bladder, but could not succeed in introducing more than four ounces of the fluid, and this caused him so much pain that I did not resort to it again.

On the 12th of June I introduced the lithotripter, No. 4, in the presence of Dr. Physick and G. W. Ritter, Messrs. Kennedy, Cooke and Henn. I very soon succeeded in catching the stone, and drilling a hole through it; I then changed its position, and made another perforation through it. I soon perceived that the instrument used upon this occasion was rather larger than it should have been; it did not work readily in the bladder, and it required some force to withdraw it, in consequence of the blades of the forceps enclosing some sand and mucus which prevented their closing entirely. Subsequently to the operation, Mr. G. voided with the urine a good deal of fine, red, sandy matter; the stone was found to be composed of uric acid, and its diameter was about one inch and a half.

Some hours after the operation the patient was attacked with a chill, which was followed by some fever; this, however, yielded to a bleeding and saline diaphoretics.

On the 5th of July I introduced the lithotripter, No. 3; very readily caught the stone, and made several perforations through it, and perceived it to break away considerably. This instrument was introduced and withdrawn without appearing to cause him any pain or irritation; he remained setting up the whole of this day, and felt well. On the day following the operation, however, he had a fever, which continued for some time; for the relief of which it was necessary to bleed him twice, and apply leeches over the pubes.

Knowing the stone to be much reduced in size by these two operations, and taking into consideration the extreme irritability of the bladder, I determined not to make any further attempts to destroy the stone until the heat of the summer had passed away, and then to make use of the instrument of Mr. Jacobson in preference to that of M. Civiale. In accordance with the foregoing resolution, as soon as the weather became cool I made five or six applications of the brise-pierre, (I have not kept a record of the dates,) and succeeded completely in breaking up the stone. Neither of these operations occupied more than two or three minutes; the last one was performed in November; a short time subsequently to which, Mr. G. passed out the whole of the remaining fragments, and declared himself to be perfectly free from all the painful symptoms he had formerly endured. I now sounded him very carefully, but could not detect any stone. Soon after the operation Mr. G.'s urine increased in quantity very much, and he can now retain it for five or six hours.

It will be perceived that Mr. G.'s case occupied a considerable time: I will just remark, that his case was an exceedingly difficult one; his situation was very critical; my object was to cure him in the safest manner possible; his condition was fortunately such as to allow me ample time, and I accordingly proceeded very cautiously and am happy that my efforts were crowned with complete success.

CASE VI. Richard Judson, aged sixty-five years, a native of England, had been afflicted with the symptoms of stone for several years, he arrived in this city in September, 1833, and applied to me for advice.

Upon sounding this patient I ascertained clearly the existence of stone in the bladder; the urethra was uncommonly large, but I found it utterly impossible to introduce a straight sound into his bladder; the instrument would pass readily as far as the neck of the bladder, and there it stopped; I at once inferred that the obstacle was occasioned either by an enlargement of the third lobe of the prostate gland, or by a tumour situated at the neck of the bladder.

In addition to the symptoms of stone, which were exceedingly painful, Mr. J. was also affected with a most obstinate costiveness, he rarely had a passage under six or seven days, and then not without the aid of an aperient; the hardened portion of the feces came away diminished in size, so as to resemble a large worm; there was also a discharge of mucus from the rectum sometimes mixed with blood.

I must confess that I did not pay a great deal of attention to these symptoms, thinking they might be occasioned either by a stricture of the rectum or by hæmorrhoids, and considering the stone to be the most prominent disorder, to the removal of which last I directed my first efforts.

As I could not succeed in getting a straight instrument into the bladder, I was obliged to abandon of course all idea of employing the lithotripter. On the 4th of October I introduced Jacobson's instrument, and caught the stone and broke it readily several times. I then withdrew the instrument which brought out within its blades a quantity of calculous matter; the patient suffered very little pain from this operation, and it was not followed by a single unpleasant symptom; he continued for many days to pass out sand and fragments, together with one or two distinct small stones. From this period I did not keep a record of the number or dates of the operations, I requested the patient to note them down, and he promised to do so, but neglected it.

The second operation was performed about the latter end of this month; on this occasion I caught the stone without difficulty and crushed it several times; I also perceived that the instrument had caught hold of some soft substance, upon withdrawing it I was astonished to find that along with calculous matter I had extracted a portion of a firm, fleshy tumour.

I freely acknowledge that I felt considerable anxiety respecting the result of this operation; I kept the patient in bed for several days, and watched him very closely; to my agreeable surprise however it was not followed by the slightest fever or any other bad symptom; on the contrary he rested better at night, and felt himself more relieved from pain. After this operation the patient discharged a considerable number of fragments, together with seven or eight distinct stones of large size, of some of which the shortest diameter was by actual measurement half an inch.

Between this period and the beginning of June, 1834, I made probably ten or twelve applications of the brise-pierre; neither of the operations however occupied more than two or three minutes, nor were any of them followed by unpleasant symptoms; the quantity of stone

voided after these operations was immense, the bladder in fact appeared to be almost completely filled with calculous matter. It should be stated that during the winter the patient's system got into a prostrated state, unconnected with any aggravation of the calculous symptoms, in consequence of which however I did not think it proper to apply the instrument for near two months.

The last operation was performed in the beginning of June, it occupied two minutes; one hour after its performance the patient was up and about his room as usual. A short time subsequently to this operation I sounded the bladder very carefully, and could not detect any stone; expressed the opinion that it was sufficiently broken up; and stating that there might be some small fragments remaining, but that I thought they would be discharged without my being obliged to employ again the brise-pierre.

In the beginning of July Mr. Judson was looking out for a situation in the country, to which he could retire during the warm weather, which seemed to distress him exceedingly; about the 20th of the month however he was attacked with a diarrhœa, and he died on the 29th.

On the 30th my friend Dr. PANCOAST had the kindness to make for me the post mortem examination; upon taking out the bladder and rectum I had the gratification to find that I had succeeded most completely in breaking up the whole of the stones; there were remaining in the bladder but four small fragments, much smaller than a great many others which he had passed through the urethra, and had he lived a short time longer these would unquestionably have been discharged.

The structure of the bladder itself did not exhibit the slightest evidence of having been in the least degree injured by my operations; the following note however which I received from Dr. Pancoast will best explain the morbid condition of this organ, and of the rectum, together with the probable cause of the patient's death.

DEAR SIR,

In compliance with your request I have made an autopsic examination of Richard Judson. From the nature of the case, and the shortness of the time allowed me, I limited my attention more particularly to the study of the abdominal and pelvic viscera.

The peritoneum, both in the pelvis and abdomen, was perfectly healthy. The mucous membrane of the intestines was more vascular and of a darker colour than usual. Many patches of a dark-brown colour were found at the lower extremity of the ileon. The follicles were also very much enlarged, especially in the large intestines.

Both kidneys were found of their usual size; containing no calculi. When laid open they appeared much softer than usual, so that the finger could be readily passed through them. They were of a purplish hue; the cellular and adipose tissue surrounding them were hard and dense, and could be separated

from the kidney without tearing up its cortical substance. This, with the hyperemia and softening, constitute the strongest anatomical characteristic of long existing nephritis. The pelvis and ureters were healthy in appearance, though enlarged to about four times their natural size. The bladder was much contracted; the walls thickened to about twice their natural dimensions, and of greater density than usual. The cellular tissue connecting it with the rectum and prostate gland, was so hard and dense as to seem to have prevented even a moderate dilatation of the bladder; thus probably causing the dilatation of the ducts of the kidneys by the accumulation of urine in them. From the healthiness of the structure of these ducts, the inflammation of the kidneys could not within any recent time, at least, have been an extension of disease from the bladder. The mucous membrane of the bladder was thicker, but not softer than usual. The cavity of the bladder was of very irregular form; the prostate was enormously enlarged, and generally of a scirrhus hardness; it formed an irregular sphere of about two inches and a half in diameter: its vertical development was almost entirely at the expense of the cavity of the bladder. The projection made by the middle lobe into the bladder was about the usual size of the entire gland. On each of the enlarged lateral lobes was a projection overhanging the caput gallinaginis, about the size of the human ovary. The opening into the bladder was thus very much obstructed, and nearly vertical at the prostate gland owing to the projection of the middle lobe. On the right side of the caput gallinaginis, was found one and on the left two smooth, oval cavities, extending almost to the bottom of the prostate, all of which appeared to have contained calculi, and in one a small calculus was found. These cavities were from half an inch to three-quarters in diameter. The bas fond of the bladder was formed of two similar cavities, with an elevation of the mucous membrane between them. In the posterior wall several cavities of the same sort were found, two of which contained small stones. The cysts were formed of all the tunics of the bladder. Four fragments of calculi were found free; the largest of which was about the size of a small hazelnut. The projections of the prostate gland into the bladder, were softened and pultaceous at their top, and of a dark colour. In the centre, and on the side of the rectum, the gland was of a scirrhus hardness, and of a bluish colour.

The anterior wall of the rectum, immediately adjoining the prostate, was softened and almost removed by ulceration, for an extent about equal to the size of the gland. The margin of the ulcer was steep and scirrhus; the tunics of the intestines blended together by the disease, with that complete loss of anatomical character which we observe in cancer. Opposite this place, and just below it, the calibre of the intestine was very much contracted, so as to leave but a very narrow opening for the passage of the feces.

To Dr. RANDOLPH.

Yours, very truly,
J. PANCOAST.

As I propose at some future day, upon greater experience, to offer my views relative to this most interesting operation, more at large, to the profession, I shall not at present anticipate any remarks which I may then have to make, further than by replying to one or two objections which have been urged against the operation.

It has been stated, and that too by some who profess themselves friendly to lithotripsy, that this operation will be found applicable to a small minority only of the cases of stone. The ample experience of the European gentlemen engaged in the performance of this operation, backed also by my own limited observations, has led me to a very different conclusion. I believe that of the cases of stone in adults, eight out of ten will be found suitable to the operation of lithotripsy. Stone occurring among children I do not take into consideration, because in them the operation of lithotomy is comparatively so safe that I do not think it requires a substitute.

Since engaging in my first case of lithotripsy, in September, 1832; ten cases of stone in adults have come under my notice; the history of six of these cases I have already detailed. The seventh case occurred in a coloured female, who had a small stone, which I have no doubt could readily have been crushed; she, however, suddenly disappeared, and I have never seen her since. The eighth case occurred in a young man from Virginia, upon whom I operated twice successfully in the Alms-house Infirmary, in the presence of a number of gentlemen; this patient unfortunately contracted a typhus fever, and when convalescent, returned home to recruit his strength, under a promise to return; he, however, was induced to submit to lithotomy in Virginia, and it was stated that the stone was broken by my operations. The *ninth* case occurred in a gentleman of this city, who changed his mind during the preparatory steps for lithotripsy, and was successfully cut by Dr. HARRIS. Dr. H. informed me subsequently, that the stone was so soft that it broke into pieces in extracting it from the bladder.

The tenth case occurred in a medical gentleman who came on to this city from North Carolina, with the express view of submitting to the operation of lithotripsy; I freely admit that the operation was not applicable to this case; upon repeated examination I ascertained that there was an ulcer situated just beyond the mouth of the urethra, in consequence of which the canal was so much contracted at that part, and the attempts to dilate were productive of so much pain, that I was obliged to abandon lithotripsy, and perform on him the operation of lithotomy, which terminated successfully.

Another principal objection which has been urged against the operation of lithotripsy, consists in the difficulty of extracting the numerous fragments into which the stone may be broken, and the liability of such fragments to remain in the bladder and serve as nuclei for the formation of other stones. This may appear to be a very important consideration to persons unacquainted with the extraordinary power

which the bladder and urethra possess to discharge foreign substances lodged in them. I have so repeatedly, however, witnessed the discharge of fragments, of almost incredible size, that I am well convinced this difficulty has been very much exaggerated, and I believe that by proper attention, any fragment which may exist in the bladder, and be too large to pass into the urethra, can be detected by a sound, and broken up by an instrument, so as to admit of being discharged.

With respect to the fragments lodging in the bladder, and serving as nuclei for other stones, I here wish to record a fact, which I am not aware has been noticed by any preceding writer, it is this—that *fragments of stone lodged in the bladder, and too large to pass through the urethra, so far from invariably increasing in size by accretion, in many instances have their angles and sharp corners so rounded off by the action of the urine, as to be reduced to a less size, and admit of being discharged.* I have several specimens which conclusively illustrate this fact.

If it be admitted, however, that a fragment of stone remaining in the bladder forms a sufficient objection to the operation of lithotripsy, it must be conceded that the same objection applies in no small degree to the operation of lithotomy. It not unfrequently happens in extracting a stone through an incision of the bladder, that owing to its softness it is crushed into innumerable fragments by the blades of the forceps, and under such circumstances, no man, whatever care he may exercise, can say with certainty that he has extracted every particle of the calculus. I believe the operation of lithotomy is very rarely performed without some small fragment of stone being broken off during its extraction, in a great majority of cases such a fragment escapes from the bladder along with the urine; in other instances, however, it may remain and serve as a nucleus for another stone. Cases indeed are reported in which after the operation of lithotomy has been performed, there has been a recurrence of the stone, and the patients have been cured by the operation of lithotripsy.

With respect to the comparative safety of the operations of lithotripsy and lithotomy, this is a point which experience alone can determine; my own impressions are in favour of the former operation, at any rate it is the one which I would select to have performed on myself in case of need.

It must be conceded that the operation of lithotripsy possesses one great advantage over lithotomy, sufficient, I think, of itself to outweigh all the objections which have been enumerated—which is, that it is not attended with the danger of incontinence of urine.

This evil which not unfrequently occurs in males, and almost in-

variably ensues from the operation of lithotomy in females, is itself of such magnitude as to render life scarcely desirable. May we not hope that the day has arrived when no man will be willing to subject an unfortunate female to such a terrible consequence, by resorting to the operation of lithotomy instead of lithotripsy.

I do not propose to enter upon a discussion of the relative merits of the several instruments used for the performance of this operation; it is very natural that the inventor of each of these should endeavour to establish his own method, by using every argument in his power in favour of his own instrument, and saying as little as possible in praise of that of his rival.

Admitting that M. Civiale has exaggerated not a little the successful results of his operations, still it cannot be questioned that he has performed a sufficient number of cures to immortalize his name, and we cannot for a moment suppose that the rewards and honours which have been heaped upon him by competent judges, would have been bestowed upon one undeserving of them.

Mr. LEROY D'ETIOLE, who claims the merit of being the principal author of the operation of lithotripsy, in a statement made by him in July, 1833, says, that out of thirteen cases of stone he succeeded in curing twelve; he admits, however, that in each of these operations he made use of the *brise-pierre articulé* of Mr. Jacobson, and that three of the cases were cured by means of this instrument alone.

The "*percuteur courbe a marteau*," invented by BARON HEURTELOUP, I have not yet had an opportunity of procuring; the success derived from its application by its distinguished author has been flattering in the extreme; out of thirty-eight cases of stone he succeeded in curing thirty seven; these operations were witnessed, and are certified to by some of the most distinguished surgeons and physicians of all Europe.

Sir ASTLEY COOPER placed the unsuccessful case under the care of the Baron, and after death furnished its autopsic history, in which he says there were sufficient causes of death independent of the operation.

It is not necessary for me to repeat what I have already said in praise of Mr. Jacobson's instrument.

I cannot conclude this paper without offering to each of the names I have enumerated the homage of my unfeigned admiration and respect for having ameliorated the condition of suffering humanity, and enriched our science by the introduction of their most useful and important discoveries.

Philadelphia, September 1st, 1834.

