

**Cases of lithotrity, or examples of the stone cured without incision : followed by a description of the first symptoms of the disease / by Baron Heurteloup.**

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**CASES OF LITHOTRITY,**

*&c. &c.*

CASES OF LITHOTRITY.

1831

1831

STONE CURED WITHOUT INCISION.

IN THE PRESS, IN 8vo.

PRINCIPLES OF LITHOTRITY,

OR A

TREATISE

ON THE

ART OF CURING THE STONE WITHOUT INCISION.

BY BARON HEURTELOUP.

BY BARON HEURTELOUP.

AND THE ART OF CURING THE STONE WITHOUT INCISION.

LONDON

PRINTED BY T. AND C. UNDERWOOD,

15, N. B. STREET.

1831

CASES OF LITHOTRITY,

3

OR

Examples

OF THE

STONE CURED WITHOUT INCISION;

FOLLOWED BY

A DESCRIPTION OF THE FIRST SYMPTOMS  
OF THE DISEASE.

BY BARON HEURTELOUP,

DOCTOR OF THE FACULTY OF MEDICINE OF PARIS.



LONDON:

PUBLISHED BY T. AND G. UNDERWOOD,  
FLEET STREET.

1831.

CASES OF LITHOTOMY

MONSIEUR ANTHONY WHITE

Chirurgien de l'Hôpital de Westminster, Agrandisseur au Collège Royal  
des Chirurgiens, &c. &c.

STONE GRONED WITHOUT INCISION

Vous ne me connaissez pas, et cependant c'est  
sous vos auspices que je suis venu apporter en Angle-  
terre l'art précieux qui doit soustraire aux souffrances  
et aux dangers de la pierre les habitants de ce pays.

Vous ne me connaissez pas, et j'ai trouvé en vous  
un appui, un conseil et tous les procédés délicats ca-  
pables d'opérer devant moi les difficultés que je  
devois naturellement rencontrer.

Lorsqu'avec vous eût été seulement pour l'honneur de la  
science et de l'humanité, puis-je que tenu en vos soins  
étaient les plus empreints et votre sollicitude pour mes  
succès était la plus grande, je n'en avais pas encore pu  
vous inspirer l'intérêt que vous avez bien voulu me

LONDON:

HENRY BAYLIS, JOHNSON'S-COURT, FLEET-STREET.

Doiftez donc que je vous remercie au nom de l'hu-  
manité et de cette science que vous cultivez avec tant  
d'avantages, et dont vous entendez si bien les intérêts.

À

MONSIEUR ANTHONY WHITE,

*Chirurgien de l'Hôpital de Westminster, Examineur au Collège Royal  
des Chirurgiens, etc. etc.*

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MON AMI,

*Vous ne me connaissiez pas, et cependant c'est sous vos auspices que je suis venu apporter en Angleterre l'art précieux qui doit soustraire aux souffrances et aux dangers de la pierre les habitans de ce pays.*

*Vous ne me connaissiez pas, et j'ai trouvé en vous un appui, un conseil et tous les procédés délicats capables d'applanir devant moi les difficultés que je devais naturellement rencontrer.*

*Vous m'avez donc aidé seulement pour l'amour de la science et de l'humanité, puis-qu'au tems où vos soins étaient les plus pressés et votre sollicitude pour mes succès était la plus grande, je n'avais pas encore pu vous inspirer l'intérêt que vous avez bien voulu me témoigner.*

*Souffrez donc que je vous remercie au nom de l'humanité et de cette science que vous cultivez avec tant d'avantages, et dont vous entendez si bien les intérêts.*



*Souffrez aussi que je vous dédie ce petit livre comme un témoignage de mon inaltérable et vive reconnaissance.*

*Votre Ami,*

**BARON HEURTELOUP.**

*No. 1, Vere Street, Cavendish Square,*

*Ce 10 Mars, 1831.*

TO

ANTHONY WHITE, Esq.,

*Surgeon to the Westminster Hospital, and one of the Court of Examiners of  
the Royal College of Surgeons, &c. &c.*

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MY ESTEEMED FRIEND,

Although a perfect stranger to you, it was under your kind auspices that I ventured to introduce into this country the valuable art of Lithotrity—an art which tends materially to diminish the sufferings and danger resulting from calculous diseases.

I am happy in thus publicly acknowledging the support which I have derived from your friendship, and that I found in you a counsellor peculiarly capable of directing and supporting me in subduing the difficulties which I might naturally expect to encounter.

You have aided me, because you were influenced by a pure love of science and humanity; for at the time that your solicitude and exertions in my behalf were most energetic, I could not

have inspired you with that interest which you have been pleased to take in my success.

Permit me now to thank you, in the name of humanity, and in the name of that science which you cultivate with such distinction, and with the true interests of which you are so intimately acquainted.

Permit me also to dedicate to you this little book, as a memento of the deep and unalterable gratitude entertained by

Your Friend,

BARON HEURTELOUP.

*No. 1, Vere Street, Cavendish Square,*

*10th March, 1831.*

## INTRODUCTION.

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EIGHTEEN months have elapsed since I first introduced lithotrity, or the art of removing stone without incision, into England. In London, as in Paris, my successful operations have been numerous. I have published the first cases, with a view of attracting the public attention to this important operation. This new method consists in the introduction, by the urethra, of instruments adapted to the crushing of calculi in the bladder, in order that the powder, and larger fragments, may be carried away in the stream of urine. It may be easily conceived, that when well executed, this process will induce no danger, since regard is paid to the security of the parts.\* It is important

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\* The destruction of the stone takes place in the middle of the water with which the bladder is previously injected, so that the part of the instrument which grasps the stone is never in contact with the parieties of the bladder.

that this system of operating; so beneficial to mankind, should not only be known to exist, but also that it has already been put into practice with success in England, for the cures effected in a country which is to derive benefit from this novel and effectual means, afford a more striking conviction than those obtained in a distant country; it is with this intention solely that I limit myself to the publication of the first cases which I have obtained in England, exclusive of those much more numerous instances which I have happily treated in France.

I subjoin to the examples of cures, a description of the primitive symptoms of stone, extracted from a work which I am about to publish;\* although these symptoms are generally known to medical men, I publish them nevertheless, because I believe they are presented in a more methodical manner and in a truer light than they have hitherto appeared in, and because now that lithotrity is established, the knowledge of them cannot be too widely spread. In fact, lithotrity, although an excellent means of treating without danger, persons afflicted with stone, has, like other modes of treatment, its difficulties

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\* This work is entitled "Principles of Lithotrity, or the Art of Curing the Stone, without Incision;" its publication is delayed by the difficulty attending the English translation, and the execution of the plates.

and unfavourable cases, which renders it sometimes inapplicable.\* The patients being sometimes ignorant of the first symptoms which denote the presence of a stone in the bladder, live in a deceitful security; they permit the calculus to enlarge, and allow time to the bladder to become diseased. These are the unfavourable circumstances of which I wish to speak, and which are chiefly owing to the ignorance which generally exists respecting these primitive symptoms. We see, therefore, how important it is to render the knowledge of them as popular as possible. It is evident that by not doing so we deprive lithotrity of one of its greatest elements of success, for numerous examples have proved that, employed

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\* Several times I have been compelled to abandon the idea of applying lithotrity on patients whom I did not think in a favourable condition to undergo the operation, and I shall most likely meet with similar cases. There are at present patients, who having been long afflicted with the stone, will present themselves in a less favourable state than they would have been at the commencement of the disease; a considerable number of examples have, however, proved that such persons are treated by lithotrity with complete success. One of the most important advantages possessed by this mode of treatment over lithotomy, is, that it can be tried without the least danger, which the other operation does not admit of.

In proportion as lithotrity becomes more generally known, these unfavourable cases will be more uncommon, for the surgeon will not then have to treat patients who, from their timidity, have given time for their bladder to become diseased, and for the calculi to increase in size.

at the commencement of the disease, the recovery is generally rendered infallible. . In fine, I have published these leading symptoms, because I am persuaded that if the knowledge of them were generally spread, lithotrity would efface the stone from the catalogue of serious maladies. Being firmly *convinced* of the advantages which may be derived from this publication, I am bound in duty to make it.\*

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\* It would not be unworthy of the attention of the numerous societies for the promotion of useful knowledge in England, to promulgate the knowledge of the first symptoms of stone, by distributing copies among the poor ; to this effect, and in order to contribute my feeble aid to the efforts of the benevolent, I fully authorize the publication of *the introduction to this little treatise, and of the first symptoms of stone*, by which means they will be generally known, and patients will present themselves to the surgeons at the commencement of their disease, when their condition is still favourable.\* Why should not an acquaintance with lithotrity be promulgated as carefully and as universally as vaccination ?

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\* Every Thursday, from two till four, I shall be at home for the consultation of the poor, and I will treat at my house those who are in a favourable condition for the operation of lithotrity.

## CASES OF LITHOTRITY.

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THE following pages contain\* an “exposé” of the first operations of Lithotrity, which I have been called on to perform in London, since I have had the gratification of introducing into this country a new and important method of removing calculi from the bladder, as well as the means which I employ to obtain this result; for the invention of which, the “Institut de France” has honoured me with several rewards, and particularly with the first prize of Surgery, in the year 1827.†

Since it is not my intention to enter into any scientific considerations, which will afford a sub-

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\* I was desirous that these cases should have been read from the manuscript at the Medico-Chirurgical Society, but having been compelled by circumstances to hasten the publication, I was prevented from soliciting this honour; I however earnestly hope that the learned society will discover in my intentions a proof of my profound respect.

† This prize was conferred with the unanimous consent of Messrs. Portal, Boyer, Chaptal, Dumeril, Dulong, Gay-Lussac, de Blainville, Frédéric Cuvier, and Magendie, who were chosen by the society as arbitrators, to distribute the prizes of Medicine and Surgery, established by M. de Montyon.



ject for a more considerable work, now in progress, I shall state simple facts, and briefly point out the most striking circumstances which have attended them.

Before we take into consideration the interesting details afforded by a new mode of treating a disease, we must prove that the means employed for obtaining the cure are advantageous, and consequently worthy of our attention; this I hope to accomplish by presenting a considerable number of successful cases.

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Mr. Wattie, formerly a seaman, 64 years of age, residing at No. 78, Upper Ebury-street, Pimlico, was presented to me by Mr. White. In three applications of the "perce-pierre," which took place on the 24th and 30th July, and on the 20th August, 1829, two calculi were destroyed, which might have been from six to eight lines in diameter.

There was nothing very remarkable in this case, except a violent contraction of the bladder, which Mr. White and myself proved to be, as nearly as possible, equal to that which would result from a pressure of thirty-seven pounds on an animal's bladder distended with water. Mr. Wattie's case is, however, to myself rendered interesting, from his having been the first patient treated by Lithotrity in England; and I feel much gratified in

having this opportunity of expressing my obligation to Mr. White, for his liberality in confiding to my care the first patient operated on in this country, with the instruments used in Lithotrity, and for thus laying the foundation of that success which has accompanied my subsequent progress. The first operations were performed at the house of Mr. White, in the presence of Messrs. White, Edwards, Maitland, Gilbert, Ware, &c. &c.

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Major Moore, of Dublin, 46 years of age, was recommended to me by Messrs. Brodie and Crampton. His bladder contained a spherical calculus, composed of triple phosphate, of a soft substance, and about ten lines in diameter, which a surgeon of distinction had unsuccessfully sought to extract with a pair of curved forceps.\* This

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\* Among the patients whom I operated on, several had, previously to their confiding themselves to my care, unsuccessfully sought to have their calculi extracted with the curved forceps, the ingenious author of which is too well known for me to think it necessary to name him.

This is a useful and valuable invention, since, by its means, patients have been cured of the stone, without being obliged to run the risks of Lithotomy, but tis of less importance since the discovery of Lithotrity; for if it could be applied with advantage when patients could only be relieved of calculi by having recourse to the knife, now that it can be compared to Lithotrity, it is attended with many and serious risks, of which I will select the three most important :—

patient was relieved of his stone, and recovered completely after two operations.

The only circumstance worthy of remark is that the stone, when once forced into the cervix of the bladder by the urine, was retained there for a considerable length of time; this threw the patient into a continual state of spasm, and produced a

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1. By employing the forceps the surgeon is in danger of lacerating the urethra, and of producing urinary fistulæ.

2. It often requires that an incision should be made, in order to extract a calculus, which from its size sometimes remains entangled in the urethra; and if this takes place near the neck of the bladder, it differs little from the operation of Lithotomy.

3. When it has been found necessary to make an incision in the perineum, which in itself is not unaccompanied with danger, and that there still remain several calculi in the bladder, which is often the case, this operation is of little avail, for the portion of the urethra which was cut into in order to extract the stone, must necessarily contract more or less, and thus present an obstacle to the introduction of the instruments of Lithotrixy; the patient will consequently be compelled to have his bladder cut open in order to have the stone extracted, which remains in its interior.

Thus we see that the application of the curved forceps is attended with danger, and that it can only be completely successful when the calculus is very small, and even then, notwithstanding the skill of the operators, it is seldom seized and extracted; searching for the stone always fatigues the patient much more than several operations with an instrument of Lithotrixy. Another disadvantage is that the surgeon can never foresee whether or no it will be necessary to make an incision in the perineum, not knowing whether he has grasped a stone with projecting angles, or one too large to pass through the urethra.

catarrh of the bladder, which ceased entirely when the stone was extracted.

Major Moore was operated on in the presence of Dr. Boyton, Mr. Pierrepoint, and several of the Major's friends, not medical gentlemen, at No. 2, Northumberland-court, Strand.

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Admiral \*\*\* of Exeter, 64 years of age, was placed under my care by Mr. White. He had, for several years, been afflicted with a stone, which was about fifteen lines in diameter, when I sounded him; it was spherical, composed of uric acid, and very hard. The prostate gland was enlarged to such a degree, that it obstructed the free passage of the urine, which was thick, and deposited a considerable quantity of muco-purulent catarrh, and which the patient could not eject in a full stream; he felt a desire to make water nearly every half hour, and the expulsion of the urine was attended with acute pain; the bladder was very uneven, and intersected with septa; beneath the enlarged prostate there existed a considerable pouch which lodged the stone. Notwithstanding these disadvantages, I undertook to destroy the calculus. It was first broken down with the "évideur à virgule," and afterwards comminuted with a common three-branched instrument, with only one hooked extremity, on

account of the irregularity of the bladder. As the cavity situated under the cervix of the bladder, hindered, the stone or fragments from being either felt or seized, while the patient was placed horizontally, it was frequently found necessary to operate on him in an inclined position, which was easily obtained by means of a rectangular bed.\* The case before us proves the importance of this position. The Admiral being unable to make water in a stream, on account of the enlarged prostate, it followed, that he could only pass the powder, and no fragments; this circumstance induced me to construct an evacuating sound with which the patient was enabled to void large pieces of calculi.

The Admiral left London in perfect health in February, but wrote me a letter about five months after his arrival at Exeter, stating that his former sufferings had returned. I desired him to come up to London immediately, sounded him, and

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\* This is a sort of couch on which the patients are conveniently placed, as well for the surgeons as for themselves; the position of this bed admits of being inclined, by which means a stone, placed near the neck of the bladder, where it is seized with difficulty, falls to the fundus, and is easily grasped by the instrument. To this operating couch we may in a great measure attribute the little pain and fatigue which patients experience.

This rectangular bed also has the advantage of maintaining the instrument immoveable in the middle of the water injected into the bladder, whilst the stone is being acted upon.

discovered a calculus, nearly as large as the one of which he had just been relieved. The stone was comminuted, and the fragments brought out in the same manner as before. The Admiral very naturally thought that this second calculus must have had for nucleus a fragment of the former one, left in the bladder. I was of the same opinion, although Mr. White and myself had sounded the patient three or four times after the last operation, without finding the smallest remnant of calculus; but a careful examination of the fragments of the second stone, convinced both the patient and myself, that it was quite a new formation, for it was white, and purely composed of triple phosphate, whilst the first one was red, and entirely formed of uric acid: if a fragment of this stone had remained in the bladder, it would immediately have been recognized.

It is probable that this patient will be again afflicted with the stone, since, in his case, it forms so rapidly. I warned him of it before he left, in order that he might not allow the calculus to attain any magnitude. The Admiral can only be completely cured, when, by a process of nature, his constitution changes; for as, from a sound state of health, he became subject to form calculous concretions, so, from a tendency to make stone, he may recover his primitive constitution: he has therefore every reason to hope for a perfect

recovery, if he has not already obtained it, and if, as I suppose, the disease has been removed from the prostate and bladder in consequence of the extraction of the stones.

The admiral's case is, above all others, suitably adapted for incontestably proving the importance of Lithotrity. The patient being naturally disposed to form vesical calculi, must repeatedly have undergone the operation of Lithotomy, and every time have endangered his life, had not Lithotrity come to his assistance, and afforded relief, without exposing him to any danger whatever.

This patient was operated on in presence of Sir Anthony Carlisle, and Messrs. White, Bransby Cooper, Copland Hutchison, &c. &c. &c.



Mr. Duncan, of Worcester, 50 years of age, was placed under my care by Messrs. Green and Pierrepont. He had been suffering for more than two years, and his bladder contained a calculus of about an inch in diameter: it was red, smooth, and composed of uric acid. The urine deposited a considerable quantity of catarrh, and often stopped suddenly during its expulsion: but the patient seldom suffered severely, unless he took too much exercise on foot or on horseback, which produced bloody urine.

This operation was commenced with a "trois branches à virgule,"\* with which the calculus was fractured, and the fragments were comminuted with a "perce-pierre," armed with only one claw. The only thing worth noticing in this case is the extreme sensitiveness of the bladder, which I sought to subdue by introducing bougies daily for some time before the operation. This preparatory treatment had the desired effect; for although the parts retained a degree of sensitiveness, it never amounted to absolute pain, not even during the operations. Another remarkable circumstance in the case before us is the immediate cessation of a blennorrhœa, which existed at the same time as, and was, without doubt, a consequence of the stone, for as soon as it was extracted the blennorrhœa disappeared.

The operations performed on Mr. Duncan were in the presence of Messrs. Green, Brodie, Pierrepoint, White, Edwards, Whymper, Eve, &c. &c.

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Mr. Sutcliffe, a farmer, residing at Thortle Bowers, Yorkshire, 55 years of age, having read an account of Mr. Wattie's case in the medical

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\* The "trois branches à virgule" is an instrument which can excavate and break a stone of an inch in diameter in one attack; the fragments resulting from its action resemble portions of egg-shell, which are easily comminuted by another instrument.



journals, came to London, and confided himself to my care. Two oval stones were discovered in this patient's bladder, which were smooth, and disposed in alternate layers of phosphate of lime and uric acid; they were about twenty lines in length, and from ten to twelve in thickness; the bladder was capacious, but very contractile, and the urethra was large. Notwithstanding the size of the calculi, I considered this a suitable case for Lithotrity; and the patient was subjected to the action of the "perce-pierre," which was employed in order to weaken the stones by a few perforations, so that the "brise-coque" might afterwards act with greater effect. It is to be regretted, in this case, that there was not at that time in my possession a "trois branches à virgule" sufficiently large to fill the patient's urethra, for with this instrument one operation would have reduced the stone to a favourable state for the action of the "brise-coque," which the "perce-pierre" required three or four applications to accomplish. In eight "séances," however, Mr. Sutcliffe was relieved of the large quantity of stone which his bladder contained.

This case clearly proves the importance of the "brise-coque," for after every application of this instrument, the patient voided a large quantity of detritus.

The only thing to which I shall direct attention in this case is the size of the calculi, the

detritus of which, when collected, weighed an ounce and a half.

I operated on Mr. Sutcliffe in the presence of Messrs. Earle, Brookes, Green, White, Babington, Partridge, Edwards, and many other gentlemen of the profession.

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Mr. Rodgers, of Limerick, 60 years of age, was recommended to me by Mr. Green. He had been suffering from the stone for more than a year, or what is more correct, he observed at that time the first symptoms of vesical calculus. By means of the sound a stone was discovered, which might have been from ten to twelve lines in diameter. It was attacked twice with the "perce-pierre" with little or no effect; on account of its smoothness and flattened shape, it escaped from the grasp of the branches as soon as the perforator was put into action. This circumstance induced me to employ the "brise-coque," with which, in one operation, the stone was broken; and in another, the portions of calculi which remained were reduced into powder, and fragments sufficiently small to be carried through the urethra.

A fact worthy of notice in this case is, that with the "brise-coque" was accomplished, in two operations, of short duration, what the "perce-

pierre" could not have performed in a far greater number of applications.

This cure might very probably have been obtained by means of the "perce-pierre" alone, but only by repeatedly submitting the calculus to the action of the instrument; by dint of chipping the stone, and breaking off small pieces, it might at last, perhaps, have been comminuted, but only after an exceedingly long and painful treatment. In this case, therefore, the "brise-coque" proved essentially useful. The orifice of this patient's urethra was also very much contracted, I was consequently obliged to make an incision of the little membranous fold which produces this contraction.\*

Mr. Rodgers was operated on at No. 10, Norfolk-street, in presence of Messrs. Green, White, Brodie, and Dr. Boyton.

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\* We seldom find it necessary to make this preliminary incision, but when the opening of the urethra is contracted, it is better to have recourse to these means, which are not at all, or but slightly painful, than to distend the passage.

Besides this contraction of the urethra, which is natural, there are accidental ones, known by the name of strictures, which impede the easy introduction of the instruments; these are treated before the operation is commenced. We have in our possession new instruments suitably adapted for removing strictures, by means of which we have been enabled to introduce through an urethra, which could at first only receive the smallest sized bougies, instruments of three or four lines in diameter.

Mr. Goldsmith, solicitor, about 30 years of age, residing at Watford, was presented to me by Mr. Bransby Cooper, who, having sounded the patient and discovered a stone, advised him to have recourse to lithotrity, which mode of treatment Mr. B. Cooper thought advantageous on account of the age of the patient, his good constitution, and the favourable state of his bladder. The smallness of the stones in Mr. Goldsmith's bladder rendered the application of the "perce-pierre" advantageous. With this instrument two or three small calculi were immediately seized and destroyed; but several times, one of them, although secured by the branches, eluded the grasp as soon as the drill was put into action. This clearly indicated that the stone was flat, and I resolved to destroy it with the "brise-coque," with which the flat calculus was immediately seized and crushed.

From this time every symptom indicative of stone in the bladder disappeared, and the patient recovered.

A circumstance worthy of notice in this case is, that Mr. Goldsmith, having some business to transact which required his attendance, went to Watford between the second and third operations. While he was at home, a fragment entangled in the urethra harassed the patient considerably;

he returned to London, and I pushed the fragment back into the bladder, by employing means so as not to produce any laceration of the passage. When he was relieved of the pain he felt, the operations were continued, and the remaining stone was extracted.

The shape of the flat calculus deserves attention: it consisted of two small stones, each of which resembled a large lentil; they were joined together by their edges, so that, although each one separately was about six lines in diameter, they formed together an elongated, smooth flat stone, which the "perce-pierre" seized with difficulty, and could not maintain with sufficient firmness for the perforator to act upon it. The patient passed a fragment which corresponded to the part where these two calculi were united.

Mr. Goldsmith was operated on in presence of Messrs. Bransby Cooper, White, Warren, Biggs, my pupil, &c.

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A Greenwich pensioner, about 48 years of age, consulted Mr. Dobson, surgeon to the Hospital, for a blennorrhæa. This gentleman having sounded the patient in order to discover what might be the cause of a discharge, for which no reason could be assigned, found a large stone in

the bladder, and did me the honour to send for me, and put the patient under my care.

The stone being spherical, and very large, it was thought right to commence the operation with the apparatus known by the name of "évideur à forceps."\* With this instrument, assisted by the "pince-servante," which then only served as indicator, the calculus was immediately seized, and firmly secured; for about ten minutes the eccentric excavator worked on its interior, but this was not sufficient to reduce it to fragments. The stone being formed of uric acid, and disposed in layers of different density, though they were all exceedingly hard, did not yield so readily to the action of the excavator as those calculi which are less hard, and, above all, of a more regular grain; all the centre was however wasted away by the action of the instrument.

The two following operations were performed with the "virgule;" with this instrument a large quantity of detritus was obtained, although the stone was only attacked four times.

Although the patient had voided many fragments, and a great deal of powder, the fourth operation convinced me that there still remained

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\* The apparatus "évideur à forceps" is destined to seize calculi exceeding an inch in diameter, to excavate and reduce them to concave fragments, which are crushed by the "brise-coque," of which I shall make mention in the present case.

in his bladder a large compact mass, in which there were several openings formed by the "virgule," and a central excavation resulting from the action of the "évideur à forceps."

The excavating instrument being of little avail against the excessive hardness of this calculus, I thought that by percussion I should more speedily determine the fracture of this mass, which, from being hollow, was more likely to be broken by these means than by any other. The excavator could not now act on account of the irregular interior of the stone, and the perforator was useless, from its tendency to fall into the numerous holes which had been previously made, and from thence into the hollow centre, where there was no substance for it to act upon.

It was consequently thought expedient to endeavour to break this hard concave mass by percussion; at the next operation the shock of a hammer was communicated to the stone by means of a drill, placed between three very strong branches: in a few strokes the stone was reduced to fragments.

The "perce-pierre" was employed twice, to reduce the fragments into smaller pieces, which were afterwards speedily comminuted with the "brise-coque."

This case is remarkable in many respects. In the first place, since this patient was operated on publicly, I thought it right to apply, successively,

all the instruments of lithotrity which I make use of, in order to shew the action of each one. The "perce-pierre" was employed, to prove that, although a pretty good instrument in certain cases, it had many imperfections, to obviate which I invented the "brise-coque;" the immense advantage of this instrument, as much with respect to seizing as destroying the fragments, was clearly pointed out.

In a word, this case was converted into a sort of study, by which all the medical gentlemen who were present at the different operations, were enabled to form an idea of the means now existing in the science for curing patients of the stone without incision. It was proved how important it was to be able to raise the pelvis, as is easily accomplished with the rectangular bed, for when the patient was lying on a horizontal plane, it was sometimes nearly impossible to seize the fragments, and especially the entire stone, but by changing the position, this was rendered easy, and gave much less pain. The "support fixe" was also employed with the greatest advantage; every one allowed it to be, not only of incontestable utility, but absolutely necessary, since without it the system of excavation could not be employed.

This is the first case in which percussion with a hammer was ever employed to obtain the rupture



of the shells of calculi, which the excavators could not reduce to fragments.

The gentlemen who saw this mode of proceeding could not but think it rather extraordinary that a hammer should be made to act in the bladder, but they were also unanimous in their opinion, that in many cases it might be of the utmost importance. From this cure then we may date an improvement in lithotriety.

When this patient applied to Mr. Dobson, it was to consult him for a discharge which had lasted some time; but the pensioner himself had not the slightest suspicion of the existence of a stone in his bladder, having never experienced the pains, nor observed the symptoms which it generally produces; we may therefore say, that in this case, the calculus was discovered almost by chance. This circumstance is curious, but not so uncommon as is in general imagined, and it deserves attention—for it proves that lithotriety will frequently relieve patients afflicted with large stones, although it has been said, that when this mode is generally known there will only be small calculi to destroy; but it is evident that they must sometimes become large, since persons can retain them a very long time in their bladder, without being aware of their presence. I have also to add, that this patient frequently indulged in drinking spirituous liquors during his treatment; this leads

us to the conclusion, that lithotrity is accompanied with very little danger, since, by its means, a patient was relieved of a large calculus, and restored to health, notwithstanding these deviations from a proper diet.

This patient was publicly operated on at the Greenwich Hospital in presence of a great number of medical gentlemen, and under the auspices of Mr. Dobson, to whom I express my warmest thanks for having afforded me an opportunity of making known a useful method in England, and for having contributed in so liberal and friendly a manner towards my success.

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Sir \*\*\*, Bart., residing in London, after having for about a year experienced the ordinary symptoms which indicate the existence of a calculus in the bladder, consulted Mr. Brodie, who sounded him and discovered a stone; this gentleman, thinking this a fit case for lithotrity, did me the honour to call me into consultation, and placed Sir \*\*\* under my care.

By means of the sound, a spherical stone of about ten lines in diameter, hard, smooth, and easily displaced, was discovered. Judging that it was composed of uric acid in concentric layers, and of a friable nature, from the sound produced when it came in contact with the instrument,

I employed the "perce-pierre." In three applications of this instrument the calculus was reduced into powder and fragments sufficiently small to be voided by the urethra, and the patient soon recovered.

The case of Sir \*\*\* is simple ; it consisted of a spherical, uric acid calculus, the two most favourable conditions for allowing the patient to be speedily relieved ; its spherical shape facilitates its seizure by the "perce-pierre," and its chemical composition renders its destruction easy by means of the drill.

This operation was, however, attended with difficulty on account of the violent contraction of the bladder. I must here make mention of a circumstance of some importance, which proves how little inconvenience patients sometimes feel from the operation of lithotrity. Sir \*\*\* was cured of the stone without his family being aware that he was treated for so serious a malady, and even now they continue ignorant of it ; for the patient, notwithstanding the pain he must occasionally have felt, never communicated the nature of his disease to any of his family. After every operation he returned home on foot, in the same manner as he came, and presided at his own table in the midst of his friends. I mention this circumstance, because it is curious that a person successfully treated for the stone, should have been all the while living with his family, and that they

should be ignorant of what was going forward. Every patient in the same favourable condition as Sir \*\*\*, and under the same circumstances, will suffer as little; for the most part, they walk to my house to undergo the operation, and return home in the same manner. Mr. Wattie, my first patient, 64 years of age, came two or three times from Chelsea to Parliament-street, where he was operated on, and walked back again directly after the operation.

Mr. Brodie was present at the operations performed on Sir \*\*\*, and my pupil, Mr. Biggs.

Mr. Castle, Surgeon to the County of Clare Infirmary, 62 years of age, after having suffered several years, consulted Mr. Crampton; this gentleman discovered a stone with the sound, and advised Mr. Castle to come to London and confide himself to my care. He immediately left Dublin for London, where he arrived in June, and took apartments near me, in Chapel-place, No. 16.

I sounded the patient, and discovered a stone, which was oval, not easily moveable, and composed of uric acid; it persisted in remaining under the neck of the bladder, where a proper examination could not be made without difficulty. The urine was catarrhus, and its expulsion was attended with considerable pain.

The calculus was first attacked with the "perce-pierre," which I thought might be employed with advantage in this case; but the stone being smooth and flatter than it had first appeared to be, escaped from the branches as soon as the drill pressed upon it. In five applications of this instrument the stone was not once perforated, its outside was grazed, and many small pieces were broken off, one of which evidently corresponded to the edge of a flat stone.

This was sufficient proof that the action of the "brise-coque"\* would be necessary; for to destroy a calculus of this shape, the "perce-pierre" would require a longer and more painful treatment than the patient could bear.

In three operations, a stone, which had resisted the action of the "perce-pierre," was reduced into fragments and powder.

This case is important, because Mr. Castle, who

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\* To the invention of this instrument I am chiefly indebted for having obtained the first prize of surgery conferred on me by the "Institut" of France. It is suitably adapted for crushing flat stones which are refractory to all other instruments, and the concave fragments produced by the action of the excavators on spherical calculi. The only instrument employed at present to cure the stone is the one invented by Messrs. Leroy (D'Etiolles) and Civiale, which, with a sort of drill or borer, repeatedly perforates the calculi; the action of this instrument is exceedingly tedious. The cure is seldom effected in cases of large stone, and never in cases of smooth flat ones; the "brise-coque,\*" on the contrary, immediately seizes and crushes flat calculi, as Mr. Castle's case clearly proves.

\* Shell-breaker.

is a surgeon, confided himself to my care, in order to find relief by my method. Let such a choice then call attention to that system, which, in the present case, has proved so clearly the insufficiency of the "perce-pierre," and the importance of the "brise-coque;" for let it be remarked that this instrument was only employed when we discovered the almost utter impossibility of curing the patient with the "perce-pierre." This circumstance may lead us to the conclusion, that when the science is better established, cures may be obtained more rapidly, for the treatment will be made shorter, by all the time which is wasted in ascertaining what instrument can be used with most advantage. Should I ever meet with a case similar to Mr. Castle's, I should immediately attack the stone with the "brise-coque," and by so doing, the patient would be cured in three sittings, each of which would last four or five minutes, instead of having to undergo the slow and useless attempts made with the "perce-pierre."

Mr. Castle was operated on at my house, in presence of Messrs. Hume, Clendinning, Hamilton, Biggs, and several other gentlemen.

Mr. Archer, 52 years of age, residing a little way out of town, feeling the inconveniences occa-

sioned by stone in the bladder, consulted Mr. Heelis, who sounded him, and thought he discovered a calculus, but he felt it so indistinctly, that he could not affirm positively that there was one. In this state of uncertainty, Mr. Heelis was kind enough to apply to me; I found Mr. Archer in the enjoyment of pretty good health, but the urine was rather thick, and deposited a little catarrh.

I sounded the patient, and experienced the same difficulty in feeling the stone as Mr. Heelis. In the same manner as this gentleman, I had a faint sensation of having touched a stone, but the feeling was so imperfect, that I could not insure the existence of a calculous body. The bladder was irregular, covered with cells, and during its contractions it was intersected with fleshy columns, between which the stone might conceal itself, and be secure from any contact with the sound. However, taking into consideration the symptoms of stone, which were well characterised, and the sensations which had been felt, however imperfectly, and being at the same time fully persuaded that the introduction of an instrument could not be productive of the slightest inconvenience, it was thought advisable to operate; for it was evident that if a stone did exist, it must have been small, and would be immediately seized and comminuted. By introducing an instrument to examine the bladder, I should not only be ob-

taining exact notions of the complaint, but should also be taking prompt measures for relieving the patient.

I put this plan into execution, and employed a "perce-pierre" with only one hook, on account of the inequalities of the bladder. Notwithstanding these inequalities, a fungous and varicose state of the cervix, and a high degree of contraction, a small round uric-acid stone was seized and reduced to fragments and powder.

This case is interesting for various reasons; it proves that a calculus cannot always be detected by means of catheterism, and that an instrument of lithotripsy is not only better adapted than a sound to discover a calculus, but that a surgeon may, in some cases, convert a simple examination into an immediate operation.

Mr. Archer's case is also curious, from his having had a bladder with a varicose neck, which swelled to such a degree after the introduction of the instrument, that it presented an almost insurmountable obstacle to the expulsion of the urine; for four or five days the patient could not pass a drop of urine without the assistance of a catheter, which was introduced daily, and sometimes more frequently, to empty the bladder: it had the two-fold advantage of bringing out the water, and enabling the patient to expel his fragments immediately, and without the least difficulty. In the course of a few days, he was able to make water



in a full stream, but for a fortnight he continued to pass a little glairy mucus.

I operated on Mr. Archer in presence of Mr. Heelis, and my pupil, Mr. Biggs.

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Captain Armstrong, from Banagher, 64 years of age, after having suffered for about two years and-a-half, consulted Mr. Crampton, who having discovered a stone, was kind enough to give him the same advice as he had given to Mr. Rodgers, and Major Moore, to come to London and put himself under my care.

The Captain came immediately, I sounded him, and discovered a large, smooth, oval stone, which could be readily displaced, but did not roll; the bladder was capacious, but contractile, the urethra was large, and the patient's health was pretty good, with the exception that he ate with little or no appetite.

Two days after the examination, Captain Armstrong appeared to be in a favourable condition to undergo the operation; the "trois branches à virgule," which is suitably constructed for breaking down oval stones, was employed.

In the first operation the "virgule" acted twice on the stone, and produced much detritus; I also discovered that there were two calculi in the

patient's bladder, for whilst one was held fast by the instrument, another was distinctly felt.

The second operation was performed with the same instrument: the oval stone which had been before attacked, was again seized, and the "virgule" acting in the very centre, reduced it to fragments, some of which were immediately seized and comminuted.

At the third operation the "trois branches à virgule" was once more employed, in order to destroy the stone which still remained entire. In trying to accomplish this, several fragments were seized and destroyed; but when I grasped the entire calculus, the more special object of my operations, it escaped from the branches as soon as the drill which contains the "virgule" was rotated. This circumstance led me to conclude that the stone was too flat to be comminuted by the three-branched instrument, and I was so much the more confirmed in this opinion, from the patient having voided a fragment detached from the edge of the stone, in one of the former imperfect attacks; this fragment evidently corresponded to a flat calculus, which required the action of the "brise-coque." With this instrument, in three applications of four minutes each, a calculus, which had been refractory to all the other instruments, was speedily reduced to fragments and powder.

After the second application of the "brise-coque," I waited a few days to see if Captain Armstrong would experience any sensations indicative of the existence of a fragment in the bladder. Observing that the stream of water was not so regular as it should be, I examined the patient with a "perce-pierre" which had but one hooked branch; and a small fragment was seized and crushed immediately.

From this time the patient made rapid progress towards his recovery, and soon afterwards returned to Dublin.

The quantity of stone in this patient's bladder, and the rapidity with which he was relieved of it, render this case interesting; it also shews the comparative advantage of two different instruments: the "brise-coque" and the "trois branches à virgule;" the latter was found to be applicable in the case of an oval stone, but proved to be very unfavourable when used in relation to a flat one.

Captain Armstrong resided, during his stay in London, at No. 16, Chapel-place, Cavendish-square, and came to my house to be operated on.

The operations were performed in the presence of Sir Astley Cooper, Messrs. White, Key, Bransby Cooper, Copland Hutchison, Propert, Sayer, Biggs, my pupil, &c. &c.

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Mr. S\*\*\*, of Chatham, 61 years of age, after suffering for more than three years, consulted Mr. White, who recommended him to apply to me, and wished me to undertake the case, although the unfavourable state of the patient raised some doubts in his mind concerning the success of Lithotrity, if applied in such a case.

In fact, Mr. S \* \* \*, notwithstanding a pretty good state of health, presented a complication of evils which rendered his cure by these means uncertain. Besides two inguinal herniæ, and a hydrocele, his bladder threw many serious and additional obstacles in the way. For a long time he had laboured under a considerable hæmaturia; his bladder, which was badly conformed and overrun with partitions, was lined with a soft spongy membrane, which bled at the mere contact of a sound; his prostate was large, his urine deposited a large quantity of muco-purulent matter, and was often bloody; he could not make water without experiencing great pain, and the stream was small and without force, so that there was no reason to expect that the fragments would be washed out. Notwithstanding all these difficulties, I thought that Lithotrity might be applied with advantage, for although the stones were numerous they were small, and I was so much the more ready to entertain this opinion from a perfect

persuasion that such an accumulation of unfavourable circumstances must render the success of Lithotomy more doubtful.

I therefore undertook Mr. S\*\*\*'s case, and employed a "perce-pierre" with only one hook, on account of the irregularity of the bladder. In a few applications we had the satisfaction not only to relieve the patient of all the stone which his bladder contained, but to see the urine become clear, and retained in larger quantities; it was evident that the desire to make water was less frequent, and accompanied with little or no pain; the membrane was even and resisting, and did not bleed at the introduction of a sound; the hæmaturia ceased entirely, and, in a word, there was a cessation of all the unfavourable symptoms which had before existed.

The stream of urine, although considerably better, is not even now quite as it should be; this depends on the enlargement of the prostate gland.

Mr. S\*\*\*'s case is remarkable for the happy change effected in his urinary organs, which were in so deplorable a state before the operation; it is also remarkable on account of the numerous difficulties which attended the manœuvres during the operation; for, before the instruments could be applied, it was necessary to open the hydrocele: during their application we were obliged to compress the two hernia; the calculi concealed them-

selves in the lateral pouches which existed in this patient's bladder; it was therefore necessary to find them out, and place them, with the sound, on a smooth surface, before attempting to grasp them with the instrument. The bladder being lined with a soft fungous membrane, it was very difficult to seize the stones, and more especially the fragments, without coming in close contact with this membrane in the folds of which the fragments were entangled. Finally, since the urine was not expelled with sufficient force to bring out the particles of stone, it was necessary to relieve his bladder of the detritus mechanically, by means of an evacuating sound. Lithotrity however surmounted all these obstacles, and has proved successful in restoring to a favourable state, a patient on whom lithotomy could not have been practised without the greatest risk of its proving fatal.

Mr. S\*\*\* is now in the enjoyment of good health, and his bladder remains in the same favourable condition, with the exception that there is now and then a gravelly formation of triple phosphate, which is, for the most part, expelled; but if it is too large to pass through the urethra, I immediately comminute it. This tendency to form gravel will very probably cease in a short time, either, as I before remarked, from a change in the disposition of the patient, or else by means of suitable draughts and injections.

I operated on Mr. S\*\*\* in the presence of Messrs. White, Gillett, Coleman, Martin, Biggs, my pupil, &c. &c.

The Reverend \*\*\*, residing at Sanderstead, 64 years of age, had experienced difficulty in making water, and pain after walking, for about a year. He could not bear the motion of a coach, and much less ride on horseback. In this state, the patient consulted Mr. Brodie, who soon discovered, by the symptoms, and by an examination, that a calculus existed. This gentleman introduced me to Mr. \*\*\*, and entrusted me with his treatment.

Mr. \*\*\*'s health, in general, was pretty fair; but he was very irritable, and had daily an attack of rigor, accompanied with fever, which usually lasted the greater part of the night. The urine was thick and oleaginous; it deposited a purulent sediment, and the patient could not void it with any force. By means of the sound, calculous substance was distinctly felt in the bladder; but it was impossible to affirm positively whether it consisted of one or more stones. The sound it produced, and the facility with which it was moved, indicated, however, that it was small and spherical.

It was thought advisable to postpone operating

until the patient should be completely free from the attacks of fever and spasm, to which he had been subject. In about six days, he was in a favourable state to undergo the operation; and it was about to be performed, when Mr. \*\*\* complained of considerable pain in one of his testicles. I examined it, and found it very much inflamed, without being able to assign any reason for its being in such a state. The patient was treated for this inflammation, which extended to the epidermis and spermatic cord; and, when I had obtained Mr. Brodie's opinion to corroborate my own, that Mr. \*\*\* was sufficiently recovered to submit to the operation, I proceeded to the destruction of the stone.

The "perce-pierre" was employed, but with this modification—that, instead of turning the drill by means of a bow, I determined to crush the stone by percussion. To that effect I struck the perforator with a hammer; and thus communicated the shock to the calculus, which was reduced to powder, and into such small fragments, that they were all voided, notwithstanding the small degree of force with which the patient made water. In two sittings, I destroyed five or six calculi, of four or five lines in diameter. A third examination convinced us that the bladder was free from stone; and a total absence of all bad symptoms confirmed us in our opinion, and gave



us the satisfaction of pronouncing the patient completely restored; he is now in the enjoyment of perfect health.

Many circumstances render this case interesting. Mr. \*\*\*, who was feverish and uncommonly nervous before he submitted to the operation, was relieved of these unfavourable symptoms immediately after the first application of the instruments, the mere contact of which improved his state of health to such a degree, that the day after the last operation, I surprised my patient jumping from a chair, to ascertain whether any unpleasant sensations remained.

I must also remark that the violent inflammation of the testicle, which shewed itself before the operation was commenced, never once appeared during or between the applications of the instruments; and yet, the testicle having been so lately inflamed, must necessarily have had a greater tendency to become so again. This circumstance is a convincing proof that, when the operation of lithotrity is well performed, it will never produce inflammation of these organs.

In Mr. \*\*\*'s case, the employment of a hammer to destroy small stones, also deserves attention. Its application was attended with great advantage; for it not only comminutes the calculi more rapidly, but more completely. This is very frequently an object of importance, and especially

in the case before us, since the patient could not have voided large fragments, from the want of force in the expulsion of his urine.

Mr. \*\*\* was operated on at 32, Weymouth-street, in the presence of Messrs. Brodie, White, Propert, Gregory, Locock, Biggs, my pupil, &c. &c.

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These are the first operations which I have had an opportunity of performing since my arrival in London; they have all been attended with success, notwithstanding all the difficulties I had to surmount in the treatment of these patients, whose cases were all of so different a nature. I found it absolutely necessary to modify and vary the mode of treatment for each one, either in what regards the course to be followed preparatory to the operation; or else in what relates to the circumstances attending it; or, lastly, as concerns the instruments themselves, which ought certainly not to be the same for destroying stones differing in size and shape, and consequently more or less favourably adapted to the power of differently constructed instruments.

From these operations we may infer many important conclusions for lithotrity—among which we have selected the following :

Since large and sometimes numerous calculi have been comminuted, and the patient restored

to health, it follows—that lithotrity can be applied in cases of large and numerous calculi.

Since many of the patients in question have recovered, notwithstanding a considerable catarrh, and great sensitiveness of the bladder, it follows—that lithotrity can advantageously be had recourse to in cases of diseased bladder.

Since many of these patients have been restored to health notwithstanding a large and swollen prostate, we may conclude that a considerable enlargement of this gland is not an absolute hindrance to the operation of lithotrity.

Since many of the patients were unable to expel their fragments, and we succeeded in bringing them out of the bladder by means of the evacuating sound, it proves that the impossibility of voiding the fragments does not render lithotrity inadmissible.

Since flat stones have been crushed with facility by the “brise-coque,” we may infer that calculi of this shape are no longer refractory to the action of the instruments of lithotrity.

Since the facility and rapidity with which a patient is cured, is in direct proportion to the small size of the calculus, it follows that the operation of lithotrity is far more advantageous when performed at the commencement of the disease.

Since none of the patients confided to my care have had an attack of fever, during their treatment,

since the greater part of them were operated on at my house, and since all experienced so little pain as to allow them to pursue their business more or less, we are led to this important conclusion, that the operation of lithotripsy is not attended with any danger, when it is performed in proper time, with necessary care, suitable instruments, and sufficient experience.

## ON CALCULI.

WHEN calculous patients were treated by lithotomy, it was customary to conceal from them the disease with which they were attacked; if the surgeon found a stone in a healthy subject, who suffered but little, he avoided telling him, and awaited till his suffering, becoming extreme, obliged him to make the melancholy communication. But now, that we are acquainted with the art of lithotrity, the simplicity of which is the greater the earlier it is performed, it must be evident, that it is not only advantageous that the patient should be early acquainted with the nature of his complaint, but also in order that lithotrity may afford all the advantages possible to mankind, it would be of great service if the first symptoms of stone were so well known that a patient could not remain long in a deceitful state of security with all the inconveniences which this disease produces at its commencement.

It is then with the express intention of making the knowledge of these symptoms more general, that I give a rapid sketch of their nature before I proceed to the consideration of the calculi. This sketch will be more carefully deduced from the causes which produce the symptoms, and arranged more methodically than has hitherto been done; so that by this means it will be rendered more easy to detect them, and consequently I shall arrive with more certainty at the end I wish to accomplish.

*An Account of the first Symptoms of Calculus.*

When from some circumstance or other, there is a foreign body lodged in the bladder, and it remains there a short time, the salts contained in the urine are deposited around it, covering it more or less rapidly, and thus forming those concretions which vary in size, and are named vesical calculi.

It is necessary then, for the formation of these stones, that there should be some substance in the bladder around which these salts may be deposited.

Now these bodies are found in the bladder, either from being introduced through the urethra, or from having penetrated through its parieties, or they may have been formed in its interior, or

lastly they may have been formed in the kidneys, and may have descended into the bladder through the ureter.\*

Thus there have been found to form the nuclei of stones, peas, beans, the end of tobacco-pipes, pieces of sounds, pins, the teeth of combs, &c. &c., which had been introduced through the urethra. Some have been found having for their centre, shots—even bullets—which have entered the cavity of the organ through its parieties. Others are formed at first by layers of lithic matter (*λιθος, stone*), deposited round a clot of blood, a little fibrin, or a collection of mucus secreted from the lining membrane. Others have occasionally for

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\* This part of our little pamphlet being published more expressly for the perusal of patients afflicted with the stone, I think it my duty to give a general idea of the kidneys and ureters.

The kidneys exactly correspond to that part of animals known by the same name; and the examination of these organs will give a very just idea of those of the human body: they are two in number, and are placed on each side of the spine, at the height of the last rib, and about the inferior third of the back. There is a communication between the cavity of the kidneys and that of the bladder, by means of a narrow pipe or canal, about twelve or fifteen inches in length, which is called the *ureter*, and serves as a passage for the urine which is formed in the kidneys, and flows from thence into the bladder. The kidneys are hollow, although the parieties are very thick and fleshy; the ureters are of the thickness of a goose-quill, but the passage through them is so thin as hardly to contain a horse-hair; this narrowness is the cause of the acute pain felt by patients, when a piece of gravel formed in the kidneys traverses the ureters to fall into the bladder.

nuclei other stones, extremely small, commonly known by the name of gravel, which, formed in the kidneys, has descended through the ureters into the bladder, where they have given rise to the formation of a larger stone ; for their size prevents their being expelled through the urethra as soon as they fall into the cavity of the organ.

Of all vesical calculi, those which have gravel for their base are by far the most numerous, since out of twenty stones there will probably be nineteen with gravel in their centre. We must, therefore, particularly study the sensations which accompany this most frequent mode of the formation of vesical calculi ; and, in order to know these sensations, we shall examine the symptoms produced by the gravel in its formation in the kidneys, in its descent from the kidneys to the bladder, by its remaining in the bladder, and by enlarging in this organ ; so that, in this manner, we shall have the precursory symptoms of the stone, and the first symptoms of the presence of this foreign body in the bladder.

Medical science has not yet resolved the important question of what can cause this particular disposition, the effect of which is to separate from the urine that red or white powder found in the water of some individuals, which is deposited at the bottom of the vessel, sometimes in the shape of small round or sharp grains, and, at other times, in the form of extremely fine powder.



But if medicine has not yet discovered the chemical process which Nature uses in the formation of this gravel, dissection has taught us that the kidneys are the part where it is formed—that from the kidneys it descends through the narrow canal which conveys the urine from these bodies into the bladder—and from which, finally, it is expelled with the urine. Such is the situation in which the gravel is formed, and such is its passage.

It may readily be conceived that, when this gravel is in a state of powder, it may pass through this route without the patient suffering much; and thus, we see many persons void this powder without its passage giving them the least pain.\*

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\* It is much more advantageous for patients to be treated when they pass stone in the form of a powder; for when they void gravel, the treatment required is much more tedious, and is accompanied with greater difficulties. When calculus is passed in powder, it may be considered as the first stage of the gravel, and is one of the precursory and active causes of the stone: in this state it is easily cured, by restoring the secretion of the kidneys to a sound state, which is effected by means of a suitable treatment, generally consisting of draughts composed of certain chemical substances, destined to destroy acids or alkalies: this treatment sometimes has the desired effect, but it must be applied with prudence and reserve, contributing, under certain circumstances, to form stone rather than to dissolve it. I am not, however, of opinion that the formation of gravel is a mere chemical process, as the treatment generally followed would lead us to believe; it must be combined with means capable of producing a favourable change in the vital functions of the kidneys.

But if, instead of being thus fine, the gravel traverses these passages in a gritty state, it then causes great pain, and this is proportionate to the size of the gravel, the nature of which changes as it remains in the kidneys, in the different parts of the ureters, the bladder, or the urethra.

When the gravel is in one of the kidneys, the patient has the feeling of being fatigued; he experiences a numb deep-seated pain, sometimes *shooting along one side of the spine just below the ribs*; this pain extends to the upper part of the hip, it ceases, and again is apparent upon some excess of diet; it is sometimes accompanied with fever, with a sensation of fulness, of heat and throbbing, a sensation which is deep seated. Occasionally, but very rarely, there are calculi in the kidneys without any of these symptoms.

When the gravel is lodged in the upper part of the ureter, just as it begins to distend this passage, the pains become more severe, they are more acute, and last longer; according as the gravel descends, they are felt lower and lower; they extend all along the side; when the gravel reaches the middle of the ureter, it gives most severe pain, which the patient describes as shooting deep down to one or other groin, and often along the whole inner side of the thigh. Sometimes gravel of considerable size passes through the urethra without the patient having these acute sensations; but at other times it is accom-

panied with most excruciating pain, vomiting hic- coughing, febrile symptoms, and, lastly, colicky pains, known by the name of nephritic (*νεφρικός*, the kidney).

The gravel remaining in the kidney, or ureter, sometimes gives a peculiar character to the urine; commonly during the violent pains it is white, and often very abundant, slightly mucous, some- times puriform, and, lastly, at other times it is voided tinged with blood.

When the gravel reaches the bladder, the mo- ment when it escapes from the ureter, there is occasionally a sensation of laceration, or that of a body falling into the organ; sometimes hemor- rhage takes place to some extent, from the lace- ration of the edges of the extremity of the ureter which opens into the bladder; the patient feels himself instantly relieved from all the pain which was caused by the gravel when in the ureter, and if it is sufficiently small to pass through the urethra with facility, it often happens that it is carried along with the stream of urine when this fluid is expelled, and he feels no more pain; but if the gravel be large, or if, although small, the neck of the bladder rebels upon its approach, and by its contraction prevents its passing, then the gravel increases to calculi, or, what is not uncommon, there are calculi and gravel at the same time; other symptoms now arise, caused by the pre-

sence of gravel in the bladder, which, as it cannot be expelled, is now called stone.

As soon as there is a stone in the bladder, the first symptom it produces is that of derangement in the expulsion of urine; obeying the laws of gravity it continually falls towards the lowest part of the bladder, and as the neck becomes, from its perpendicular position, this lowest part, it follows that when the patient makes water whilst standing up, the stream will suddenly stop, will again flow, and again stop, until the bladder is emptied. The alternate presence of the stone will explain the reason of this interruption, its resting upon the neck without entering, stops this opening more or less completely, according to its position. Thus the first symptom indicative of a stone in the bladder, is *the more or less complete interruption in the stream of urine during its expulsion*, which arises entirely from a mechanical cause.

But the gravel, by its continued presence in the bladder, gives rise to a peculiar sensation, which we are now going to describe.

We know that when the bladder contains urine, the gravel must have free motion and must obey the impulse given to it in the different movements of the body; now this moving is perceived by the patient, but not generally felt in the cavity of the organ where it takes place. The calculus when small, obeying the laws of gravity, always falls to the lowest part of the organ, but

as on the other hand, it is as it were suspended in the urine, which has always a sufficient degree of density, it follows that whilst the patient is walking, that little body is always moving, and that it continually rolls and bounds about in the organ, alternately striking against the neck with a degree of force proportionate to the shock given to the whole body: this shock, experienced by the neck of the bladder, is sometimes felt in the anus, but more commonly along the whole canal, and particularly at the extremity of the penis, the part where the patient feels, especially if he makes a false step, a sudden shooting sensation, which sometimes is only a momentary tickling, but at other times amounts to an acute burning sensation.

This peculiar sensation at the end of the penis, at first remains only for a moment, but afterwards becomes more permanent, whether it is that the bladder being emptied, allows the calculus to remain in contact with the neck which it stimulates, or whether it is that the stone becomes heavier, and does not so readily quit this part of the organ, the constantly aroused sensibility of which gives the patient a continual desire to void his water, although the bladder contains but little fluid.

Thus the second symptom indicative of the presence of stone in the bladder, *consists in a sensation of tingling or shooting at the extremity of the penis,*

*which is not permanent, but exists at intervals both during and between the periods of making water.*

These are the two first symptoms which occur in the greater number of cases at the commencement of stone: *the patient ought then to take the advice given him, and undergo the operation of lithotrity, which would then always be followed with success, for the stone being still small may be destroyed in a few seconds, and the bladder being still healthy, allows the instruments to be expanded in it, which process, when well performed, ought never to cause any pain.*

From the moment there is a stone in the bladder, it must increase by successive layers of the salts, which are always held in suspension in the urine; sometimes it rapidly acquires a considerable size, at other times it only enlarges slowly: this difference arises from the nature of the salts of which it is composed, and the peculiar disposition of the patient. When there are several stones they do not in general become so large: this arises from their being in contact, and rolling one against another, which impedes the deposition of the lithic layers.

But if, on the one hand, the stone increases, the organ which contains it soon becomes diseased, and then arise a train of symptoms, which become more and more severe, and which, according as they proceed, render the chances of the patient being cured by these means more doubtful.

Walking soon becomes painful, the desire to void the urine is very frequent, it becomes more and more acute, and so imperative that it must be complied with immediately. The patient feels himself obliged to obey; the urine does not flow; the desire still continues; a little escapes; it again stops; a state of anxiety arises; the pain is more acute; it is again allayed; the patient again attempts; and by degrees at last succeeds in nearly emptying his bladder, and thus purchases a momentary calm, by painful efforts which will soon again be required.

It is in this alternate state of calm and suffering, that the calculous patients lives, continually striving against the obstacle which opposes the flow of his urine; he is in constant apprehension from the suffering he has already had, and which he knows will not fail to return; his disease is by its nature always increasing and never diminishing; he has not the consolation of another patient, for he cannot like him hope for a spontaneous cure.

But if the anxiety of the patient increases under the influence of the pain he feels, it increases still more from the attacks the organ containing the stone suffers, and those which are injuring his constitution.

The bladder, which was at first healthy, dilatible, and not very irritable, gradually and day by day loses this desirable state; the internal membrane becomes irritated; it inflames, and

secretes mucus at first similar to the white of egg, but which becomes more yellow, and of greater consistency, loaded with a puriform matter; the sensibility of the organ is increased; it rebels against the presence of urine, which being frequently passed without the desire of the patient, leaves the organ nearly empty, to which at last it becomes habituated. Its parietes are then in constant contact with the stone, the sensibility still increases, and at last the organ is altered in its tissues, which become thickened, and its veins varicose, the glands connected with it enlarged and tumefied, the lining membrane soft fungous, hemorrhagic and sensitive. From this it results that the patient who has neglected having the stone broken down when he was in a fit state, finds his sole refuge in lithotomy, the bladder being contracted and the stone increased in size, two circumstances which prevent his cure by lithotrity.

The pains at last become so acute, and unremitting in the organs composing the urinary system, that other organs soon become affected: the skin assumes a yellow, earthy tint, a slow fever attacks the patient, a urinary smell exhales from him, digestion is impaired, and the general sensibility is increased, his breathing becomes affected, and the unhappy sufferer falls a prey to the most excruciating sufferings, vainly calling to his relief lithotomy, which he has rejected till it is too



late to perform it without the risk of his expiring during the operation.

Thus terminates the existence of the man attacked with stone, who yielding to a foolish fear, allows the disease to increase when it would be so easy to cure it at its commencement by means which are as simple as they are devoid of pain.

Such are the primitive symptoms of stone, and the consequences of the disease when neglected. May the rapid picture I have just drawn, give those who are suffering under it, a salutary warning against its fatal termination.

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