LECTURES

ON

THE SURGICAL TREATMENT OF STONE
IN THE BLADDER.*Delivered in the Royal College of Surgeons of England, June, 1886.*

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LECTURE I.

*Introductory.—Soundings.—Lateral Lithotomy in Adults: in Children.
—Median Lithotomy.—Difficulties.—No Stone Found.—Encysted
Stone.—Wound of Rectum.—Perforation of Bladder.*

THE Council of the College having conferred on me the honour of giving these lectures, I have selected the subject of the Surgical Treatment of Stone in the Bladder, because it is the department of surgery with which I am most familiar. It may, perhaps, be thought that it has so often been treated of publicly, and more than once partially from this chair, that further discussion of it can neither be required nor right. But when I recognise the progress of opinion, and the changes of treatment which have taken place in my own time; when I contrast the first two cases of stone on which I operated in 1850, with the last two, only a few weeks ago; the former, a case of lateral lithotomy, and a case of lithotripsy in six sittings; the latter, a case of suprapubic lithotomy, and a case of lithotripsy in one sitting; this contrast of proceeding will, I hope, in some degree, justify me in occupying your attention with the old, old subject of stone in the bladder.

I do not, however, propose to treat it systematically; that I have recently and briefly done elsewhere (*vide* Heath's *Dictionary of Practical Surgery*); nor to speak of the etiology or geographical distribution of stone, a subject of great interest; that, too, I have partially discussed in an address on surgery delivered at Norwich, in 1874. Rather, I desire to travel through the subject, and to communicate such facts and hints as my experience may furnish; and, chiefly, I intend them for the possible assistance of my younger brethren. Assuredly, it is not my intention to enlarge on any successful work, but rather to point out some difficulties and dangers which beset the surgeon's course. I have the belief that, in the literature of this subject, we have heard over-much of the triumphs and successes, and too little of the obstacles and failures, which are incidental to bladder surgery. It is probable that more instruction and benefit are to be derived from a candid statement of our failures and mistakes than of our clever doings. In lithotripsy especially, there is need for a fair and explicit account of certain drawbacks and defects which have been too little spoken of or thought of by its partisans; drawbacks which the operation can well afford to admit in consideration of its brilliant achievements. Neither is it my intention to trouble you, to any extent, with statistics, for obvious reasons. They are often fallacious; the practice of no two surgeons is the same; one who, like myself, practices largely amongst the poor in hospital, must, of necessity, deal with very different cases from those treated by him who sees chiefly private patients of the educated and wealthy classes. In the one case, the poor unenlightened labourer seldom applies for relief so long as he can earn his daily bread, while the rich private patient will seek aid early; in the poor, the stone is apt to be large, and the urinary organs damaged; in the rich, the stone is probably small, and easily dealt with. One surgeon, like myself, will have most to do with stone in the aged; in my list of 300 cases, there were only 31 in children under 10, while 182 were over 60 years; while another, living, for instance, in one of the midland counties, will probably operate chiefly on the young. One surgeon refuses scarcely any cases, another refuses many; one includes amongst his fatal cases those who die from all causes during treatment; another, those only whose deaths are directly connected with, or caused by, the operation. Hence statistics, except for special purposes, have little or no general value.

As I am about to speak from the experience and observation of stone as it is seen around and in the Norfolk and Norwich Hospital, I may be allowed to refer briefly to a few of those who have done good work in that institution. Before, however, the hospital was erected, it would appear that, as on the continent, so in Norfolk, the offices of

clergyman and lithotomist were sometimes associated. In the village church of Stoke Holy Cross, near Norwich, is a mural tablet to the memory of the Rev. Thomas Havers, "qui Theologia, Medicina, Chirurgia, et Lythotomia doctus fuit et expertus." He died in 1719, aged 60.

Benjamin Gooch, whose work, *Cases and Remarks in Surgery*, is a standard book to this day, practised in Norwich about the middle of the last century. He was a lithotomist of distinction, and a man of great erudition. He was one of the first, if not the first, who practised vaginal lithotomy, and he also advocated cystotomy for vesical diseases other than stone. He was one of the founders of the hospital, and was consulting surgeon to it, but without any active duties.

Mr. Donne was the first surgeon appointed to the hospital in 1772. He had two colleagues, but it would appear that Donne must have taken all the stone cases, for the names of the others do not occur in the museum-books. He must have been a very excellent lithotomist; his name and cases are frequently mentioned in Gooch's work; and, during his thirty-two years of service, he operated on 173 patients (a larger number than any of his successors, except myself), with a mortality of 1 in 7.

Mr. Rigby, the father of Edward Rigby, the gynaecologist, was surgeon to the hospital for twenty-four years, and then physician for another seven years. He operated on 106 patients. He was a man of strong intellect, and was the author of an admirable essay on uterine hæmorrhage.

Mr. Martineau, the writer of the well known paper on Lithotomy, in the eleventh volume of the *Medico-Chirurgical Transactions*, in which he reported 84 cases with only 2 deaths, was connected with the hospital for 50 years, during 35 of which he was full surgeon; he operated on 149 cases, with a mortality of 1 in 8. Very many were children, and he was known to be careful in the selection of his cases.

Mr. Dalrymple, the father of Mr. J. Dalrymple, the ophthalmologist, was surgeon to the hospital for twenty-five years, and operated on 90 cases with good success; in one case, the stone weighed 13 ounces, but he failed to extract it. Although a man of great ability, and enjoying a wide influence in the county, he was over-sensitive and nervous in his work as a surgeon, and was eventually unable to encounter great operations.

Mr. J. G. Crosse was undoubtedly the most distinguished of the surgeons who have flourished at Norwich during this century. His indefatigable industry, his untiring energy, and his habit of copious note-taking, and of critical commentary on all he saw and did and read, enriched his mind with abundant knowledge. That which he published bears but small proportion to the volumes he left of diaries and reflections, which richly deserve to be rescued from oblivion. His Jacksonian prize essay on Stone in 1835, with its solid body of information, its full illustrations, its appendix of important cases elaborately detailed, its statistical tables, and its full catalogue of works on stone and lithotomy in all ages, and in all languages, is a lasting proof of his great merit, and stamps him as one of the foremost of provincial surgeons. He was, for twenty-four years, surgeon to the hospital, and he operated on 52 cases of stone. This may seem to be but a small number for so eminent a surgeon, but it is explained by the curious fact that Dr. Lubbock, one of the hospital physicians, with a love for surgery, operated about that period on 85 cases of stone, chiefly in small private houses, and so depleted the supply of cases to the hospital that only one or two were admitted during several separate years.

I will not pursue further this biographical digression, but proceed at once to the subject before me.

Little need be said concerning the symptoms of stone; they are generally clear and palpable enough, but sometimes they are conspicuous by their absence, and many a surgeon, led astray by this absence, has lost credit in consequence.

When the stone is small, and falls readily about the bladder, it seldom fails to cause some degree of pain and irritation; but if the patient do not seek advice, and time go on, and the stone become a large one, the symptoms may become obscure, and it is the common observation of all surgeons that, occasionally, the largest stones produce the least trouble. Here, for instance, is a lithic stone, weighing nearly nine ounces, which was removed after death. The old man had little or no pain; he never, I believe, consulted a surgeon, and died from another ailment. I found the bladder perfectly healthy, and lying loosely round the stone, which seldom moved.

Another cause of obscurity is the fixed position of the stone. I know nothing of what is called adhesion of the stone to the bladder, nor have I ever met with an instance in which it passed occasionally in and out of a cyst or sac; but it is not very unusual to meet with cases in which the stone is held immovable by irregular contraction of the

muscular columns. This large rough mulberry calculus was held in the upper fundus of the bladder; the sound detected it there, and, at the operation for its removal, I was obliged to depress the handles of the forceps, and push the blades up behind the pubes. This gentleman had carried the stone for many years, during which he experienced but very slight symptoms; he travelled much, both in England and abroad; he occasionally called on an eminent surgeon as he passed through London; but so little did he suffer, that, for a long time, there seemed no excuse for sounding. Sometimes a stone case is mistaken for one of hæmorrhoids; this is apt to be the case in old men with enlarged prostate. The piles probably exist, and the associated forcing action of the bladder and rectum will aggravate the piles, and induce the belief that they alone cause all the trouble. Hæmaturia is, of course, an usual accompaniment of stone; it is generally small in amount, and is caused by movement in exercise; but it is sometimes in large quantity, and is attended by so little irritation of the bladder, that no suspicion of stone is entertained.

Many years ago, I removed a stone, weighing two ounces, from a man who had twice been in hospitals under the physicians. The stone broke in the forceps, and large quantities of black material, like cinders, came away mixed with scales of calculous matter. It was found to be composed of alternate layers of dried blood and stone, with a nucleus of oxalate of lime. This man was cut a second time, eight years after the first, and a mixed phosphatic and lithic stone removed, and I believe he was operated on a third time by Mr. Teevan in London, where he came to reside.

Sounding for stone is by no means always a simple or easy proceeding, judging by the large number of cases in which the stone is undetected by the sound, and of those instances, also, in which it was said to exist, but in which it was really absent. Nor can it be said that this uncertainty is always due to inexperience; for I believe, and I could support this opinion by a good deal of strong evidence, that there is no surgeon, however great his experience and his manipulative dexterity may be, who has not now and again left a stone undetected in the bladder. I quite readily admit the failure in my own case, and admit also the feeling of chagrin and self-reproach which I have felt on being told of my failure.

The difficulty sometimes experienced in introducing a sound may be due to spasm; it may be the first time that any instrument has entered the urethra, and we all know how often a hitch is found at a first attempt, when no organic obstruction really exists. By far the most frequent cause of difficulty that I have noticed, however, is enlarged prostate; the altered course of the prostatic urethra, or the bar caused by hypertrophy of the median lobe, may make it especially awkward for the short sharp curve of a sound to find its way; but there is one cause of failure to find a stone which I have specially noticed, and by which even experienced surgeons have been misled. It is by sounding the deep prostatic sinus, and never reaching the bladder; the latter is at a great distance; the sound looks as if it were well in, and can be moved more or less from side to side; the bladder is assumed to be contracted; no stone is felt, and an erroneous opinion is given. If the suspicion do not cross the surgeon's mind that he has not reached the bladder, he will rest contented and mistaken; if it do, he will overcome the difficulty by well raising the patient's hips, well depressing the handle of the sound, and, by a semi-rotatory and firm forward movement, making it glide over the obstacle; if it will not do so, a sound, with a less abrupt curve, will probably pass. In this, and in all cases, the use of an anæsthetic will greatly facilitate the proceeding; but in these prostatic cases, and especially in children, it is almost essential.

I do not profess to describe the usual mode of sounding, but I may venture to remind my younger hearers that the object of sounding is much more than simply to ascertain the presence or absence of a stone; we not only do that, but we also ascertain the probable size and nature of it, and whether it is movable or fixed; the condition of the bladder as to irritability, capacity, softness or hardness, whether it is smooth or rugous; also, we note the size and prominence of the prostate. All this information the practised hand will endeavour to elicit, in order to select by what operation, if any, the calculus is to be removed. It is good that some, but not too much, urine should be present—perhaps the secretion of an hour or two. Children will not unfrequently, so much do they dread the pain in micturition, accustom the bladder to retain a large quantity; in which case, the coats of the bladder feel hard and rigid, the bony wall of the pelvis is immediately contiguous, and, between these two conditions, the sensation, but not the sound, of a foreign body is produced; while the stone itself, if one be present, is not easy to find. Very often, as the chloroform takes effect, or as the sound is passing, the bladder contracts, and a large quantity of urine is expelled with straining. Phi-

mosis and other ailments will often give rise to vivid symptoms of stone in young children. Some months ago, I was requested to go to a distance, prepared to do lithotomy for a child three years old. When I stated to my medical friend that I had only once in my life met with stone in a child of well-to-do parents, he replied, that he had sounded, and felt no doubt of the presence of a stone of some size; however, no stone could we then detect, but simply a phimosis; this was remedied, the symptoms abated, and I have heard no more of it.

Sounding, as every one knows, may be followed by serious and even fatal consequences. Retention, prostatitis, orchitis, cystitis, and nephritis—any of these may ensue, and we are warned, and properly warned, against sounding patients who have to travel immediately after it. It is, however, almost impossible to adhere to this rule; patients come up from a distance, expect to be told what is amiss, and return to their homes; and, without an examination, it may be impossible to diagnose or treat their malady. A few hours' rest should be insisted on, with simple food and a warm drink, and, where retention seems likely, an opium pill and hot fomentations. Two fatal cases from sounding have occurred to me: one from nephritis when all proper precautions were taken, just as it may occur after a simple lithotomy or after the first use of the catheter for atonic retention; the other, a few months ago, from continued prostatic retention. The sounding was easy, a small stone was detected, the patient never left his room, but there followed the necessity for constant use of the catheter, which was attended sometimes with difficulty, and bleeding, and death in about a fortnight.

The presence of a stone having been assured, the question whether any, and what, operation for its removal presents itself, and I know of none more difficult, in many cases, to decide; this question, however, I will defer for the moment, and will suppose that the old lateral operation is selected. Its applicability is becoming more and more limited, on the one hand, by the adoption of litholapaxy; and, on the other, by the improved method of suprapubic lithotomy. Those surgeons who recognise the drawbacks incident to this method, or who are not expert lithotritists, will still march on the old lines for all moderately sized stones, and it is yet to be proved that any more successful operation has been devised.

Lateral Lithotomy.—Without describing the details of the operation, I may say that at Norwich we have followed in the main the method as performed there by Martineau and Crosse, and here by Liston and Fergusson. When I entered on practice in Norwich, now thirty-five years ago, I first saw the blunt gorget in use; by degrees it became restricted to those cases in which, from great enlargement of the prostate, or from great obesity, the finger could not reach the bladder, and soon it disappeared entirely; I never used it, and now I believe the hospital is without one.

Let me say a word or two as to the mode of holding the staff. Most authorities advise that it should be held perpendicularly, and hooked up under the pubic arch. Liston used to say, "you may almost lift the patient off the table with it," meaning that it would thus be well out of the way of the rectum, and held steady. When I was demonstrating anatomy at University College, I was struck, in making dissections of the pelvis from the perineum and by vertical section, to see how easy it was to bring the membranous urethra nearer to the surface of the perineum, by inclining the handle of the staff considerably towards the abdomen. By this manœuvre its point need not, and should not, be withdrawn from the bladder; but, if it were, it would be of no consequence, because it would re-enter it the moment the handle is raised; the membranous urethra, instead of being almost perpendicular to the surface of the perineum, as it is when the staff is held upright, is brought down almost parallel with it, and is much easier to find with the knife; there is no inducement to open the urethra too far forward, and consequently less risk of wounding the bulb or its artery. The staff gets a steady rest against the front of the pubes; there is no danger to the rectum at this stage, the left forefinger is in the wound, the knife is close to it, and the bowel is guarded by it. As soon as the knife's point enters the groove, the staff is raised and hooked well up under the pubic arch, and the knife is carried on into the bladder, quite to the end of the groove. I did my early operations with the staff held in this manner—it was described in a short paper in the *BRITISH MEDICAL JOURNAL*; and I am so convinced of the facility it affords to the operator, and especially to the beginner, that it has been adopted by the members of the hospital staff ever since.

As to the deep incision, about which much has been written, I can only say that it should be moderate, but sufficient; it is useless to waste more words about it. I believe that, in many operations, the neck of the bladder is not incised at all, the knife being carefully drawn back in the same line as it was introduced, half hidden in the

groove of the staff. Some division of the prostate is necessary, and my plan is to make it as the knife is withdrawn, outwards and downwards. Experience alone can guide the surgeon, and even with experience he may do more or less than the size of the stone calls for; it is better to do less, because the knife can easily be re-applied if extraction of the stone is difficult; if more be cut than is required, the danger is, not so much of inducing urinary infiltration, as of dividing some of the plexus of vessels which surround the prostate, and so causing very troublesome hæmorrhage.

The finger follows the knife immediately; the stone is felt; and then comes what I have always deemed to be a very important step in the operation; namely, the dilatation of the deep part of the wound by the finger. Liston used to accomplish this while he seemed to be selecting the forceps, pulling the bladder down and pressing forcibly with the finger in all directions. In this I believe he imitated Martineau, who made this a special feature in his operation. Mr. Crosse says, "the staff being withdrawn, Martineau was accustomed to introduce his left forefinger (which was particularly long and large) into the bladder, forcibly dilating the opening and using the finger as a powerful but safe instrument for rendering the neck of the bladder ample to admit the forceps. The force and determination with which the finger was then used, dilating if not lacerating the undivided portion of the prostrate gland and the neck of the bladder, I always regarded as a particular and intrinsic part of his operation."

I have often thought that some special means might be adopted slowly to dilate the deep part of the wound. Such an instrument as this—a Todd's dilator for the rectum—would, by its smooth surfaces and gradual extension, make the prostate yield to the very utmost before lacerating. Professor Ellis has shown, by his excellent dissections, that the so-called gland is very largely composed of muscular fibres (*Medico-Chirurgical Transactions*, vol. lxxxix); and we all know to what a great extent the sphincter and other muscles will yield to slow and forcible stretching. Let the dilatation, however, be as slow and careful as possible, laceration will take place if the stone be of any considerable size, or if it be awkwardly seized. When splitting does take place, it is always at the rectal aspect, between the two lateral lobes, and not through the left lobe, where the knife has traversed. Who has not felt, when a full-sized stone has been dragged through a large prostate, the unmistakable sense of yielding? and, when the finger is introduced, there are the two lateral lobes, and a rift, or sense of nothing, towards the bowel. If the resistance to extraction be great, and the yielding just spoken of do not occur with moderate tractile force, it is the common and good practice to re-apply the knife; and the only question is, what is the safest and most serviceable direction in which to cut? The majority of surgeons and writers recommend a division of the right side of the prostate; but Martineau, Crosse, and the Norwich surgeons generally, have made the further incision in the same direction as the first. It may, indeed, be made in any direction; but it has always seemed to me best to keep to the first line of wound, and cut, by little and little, until the stone shall come through with moderate force applied. The motive for cutting on the right side was the fear that urinary infiltration might follow the too free division of the base of the prostate and its enclosing fascia; but now we know that infiltration of urine is seldom the cause of death after lithotomy, and I know of no fascia, at the base of the prostate, other than that which encloses it altogether. The one objection to this left side extension of the incision is, that the numerous veins which surround the gland may be cut, and lead to hæmorrhage, which is difficult to arrest; and this has always made me not averse to obtain the necessary room by splitting.

Let me advert, for a moment, to those cases in which, either from the great size of the prostate, or the great amount of fat, the finger cannot reach the bladder. I have often thought that very fat people are unusually prone to stone; and, I might add, to diabetes. Within the last three years, I have cut three men, who each weighed about 18 stones. Brodie speaks of a patient, from Norfolk, who was so large and fat that he was obliged to have a lithotrite of extra length expressly made for his case; and it fell to my lot to attend the son of this gentleman, who weighed 24 stones, and who died of suppression of urine, due to calculous obstruction of the ureter. Whatever may be the cause, the inability to reach the bladder is a serious drawback. You cannot tell the size and shape of the stone, or the precise condition of the vesical orifice; and, what is of more importance, should there be several stones, or a breakage of one, there cannot be absolute certainty of entire clearance of the bladder. In my earlier operations, I used to be somewhat disconcerted by this difficulty; but it has so often occurred, that I am quite familiar with it now. I have never resorted to the gorget as a guide to the forceps, but have introduced

the latter over the finger, and have scarcely ever found any difficulty in reaching the bladder with them. Should the stone, as well as the prostate, be of full size, and the patient fat, an association of evils by no means very unusual, in such a case the chiefest difficulties of lithotomy are accumulated; and it will require the utmost care and steadiness to overcome them, and do the least amount of injury.

In very large stones, the prostate is seldom much increased in bulk; the stone seems to weigh down the neck of the bladder, and is readily approached, if not easily removed. It has never been my lot to encounter a huge calculus, such as are to be found in every museum; the pleasant idea has been suggested that, in these enlightened days, when medical education has reached a high perfection, and when the fear of operations is allayed by anæsthetics, stone, if not stamped out, should be detected when it is small, and easily cured without lithotomy; yet even in this very year, stones weighing respectively twenty-five, twenty-three, and fourteen ounces, have been met with. I find that, a hundred years ago, the first fifty adults cut at the Norwich Hospital had an average weight of stone of 765 grains, the average age was 47, and there were thirteen deaths. In the last fifty, the average weight of stone was 590 grains, the average age was 64, and there were eight deaths. It should, however, be remembered that, during the last period, a considerable number of cases in which the stones were small were relegated to lithotritry; still, the difference is not so much as might have been expected.

Lithotomy in Children.—To go from great things to small, I desire to say a few words on lithotomy in children, chiefly with reference to the difficulty of passing the finger along the staff safely into the bladder. Sir W. Fergusson described the difficulty so well, that I will quote his words. He said: "In March, 1849, I had to operate on a boy, aged 4. I used a scalpel, and made the usual incision. In making the deepest part of the incision, I purposely used the knife as lightly as possible, with a view to open only a part of the membranous urethra, and notch the prostate and neck of the bladder. These objects being effected, the point of the left forefinger was, as usual, placed on the staff, and pushed gently towards the bladder. The finger went on, but I was aware that it had not got between the urethra and staff. With an insinuating movement (much to be appreciated by the lithotomist, who, as I do, professedly makes a small incision in this locality), I endeavoured and hoped to get its point, as usual, into the urethra and neck of the bladder. But here I felt conscious that I had failed, and was aware that the finger was getting deeper as regarded the depth of the perinæum, but that I was not materially nearer the bladder. I could feel a considerable space at the point of the finger, and was convinced that the upper part of the membranous urethra, as well as the sides above the wound, had given way to the pressure, and that now, as the finger was getting deeper into the wound, I was only pushing the prostate gland and neck of the bladder inwards and upwards. These parts seemed to recede before the smallest imaginable force, whilst I felt that I could, in a manner, make any amount of space round the bare part of the staff. I had no difficulty in distinguishing between the surface of this space and that of the mucous membrane of the bladder. Moreover, I knew that I had never crossed that narrow neck which is always felt as the finger passes into the bladder when a limited incision is made. An impression came over me that I was about to fail in getting into the bladder, and I had an idea that, unless I could open the urethra just in front of the prostate more freely, I should probably never reach the stone. This I effected with great caution, and then I could appreciate the passage of the finger, as usual, through the neck of the bladder. The stone was thereafter easily touched and removed; but, when all was finished, I was forcibly impressed with the idea that I had nearly failed in the performance of the operation." Fergusson was a master of the art of operative surgery; and, if the difficulty occurred to him, we may conclude that it is not unlikely to occur to any of us. He was under the impression that the difficulty had never been described before he mentioned it in 1864; but, in Crosse's book, published in 1835, there is a case exactly similar, with this addition, that the staff had been removed before the bladder was opened, whereas Fergusson recognised his error in time, and remedied it by a further incision.

I have seen this misadventure in several cases; in one, the staff was withdrawn; it could not be reintroduced; the stone was not removed, and the child died. One of these cases occurred to a very experienced operator—Keith, of Aberdeen. He was on a visit to me, and having two stone cases, I invited him to do one, a child aged 3½. This was in 1862, and I find, in my notes, that "he quickly bared the staff, laid aside the scalpel, used a probe-ended bistoury, and ran it along to the end of the groove, but could not find the bladder with his finger. The staff was carefully replaced in the bladder, a further division of its

neck made, and two stones easily removed." How is this mishap to be avoided? I have just stated how Ferguson and Keith overcame it by a further incision; but there must be a limit to even free incision, and my object in discussing this matter is to point out another plan which I have frequently adopted, and I can best describe it by relating the only case in which this difficulty has occurred to myself. It was many years ago when I first began to operate; the patient was an infant, only 1½ years old. I felt the impossibility, even with a fair incision, of distending the wound with my finger—it was like trying to get it into the orifice of the urethra; I therefore desisted before doing any harm, and, taking a pair of common dressing forceps, I passed them easily along the staff into the bladder; by opening the blades gently but firmly, room was gained, and the finger entered, and made room for a small lithotomy-forceps. But I have repeatedly, after passing the dressing-forceps, withdrawn the staff, and removed the stone with them, without introducing the finger at all. I can recommend this manœuvre, as both safe and efficient. I dare say it has been adopted by others, but I do not find it alluded to in modern text-books.

In older children, as in boys from 6 to 12, this want of room for the finger is still manifest. Pressure will probably overcome it, but I have sometimes pursued a method which renders the passage of the finger quite easy. Having made the requisite incisions, place the tip of the finger on the groove, and then direct the staff to be withdrawn; this being done, worm the finger along the empty urethra gently, and you will feel it glide along, dilating as it goes, until you place it on the stone; it is then used, as in the adult, to press and stretch the neck of the bladder in all directions. If the stone be found to be large, or the division of the neck of the bladder insufficient, nothing is easier than to slip a bistoury flatwise, alongside the finger, and extend the cut a little outwards and downwards. This plan I know contravenes that inflexible rule of never withdrawing the staff until the finger is in contact with the stone; but inflexibility does not always imply wisdom, and, I can answer for it, that it is much easier to pass in the finger through the empty urethra, than by the side of a large staff. The possible objection would be that the finger might perhaps wander elsewhere than into the bladder; but where could it go so easily as along the wound and open urethra, through which it passes as it would into a kid glove, and does not bruise, lacerate, or injure any part?

Median Lithotomy.—I need say but little on this subject. Some years ago we, at Norwich, gave the plan a good trial. I believe that for some years there were very few lateral operations; nearly all were done by the median method, but by degrees it came to be almost relinquished, and now it is very seldom practised there, for these reasons. By it there is not room enough to deal with stones of any considerable magnitude; the rectum on the one hand, and the bulb and its artery on the other, are both in greater danger of being injured than in the lateral operation; troublesome bleeding is more frequent; the wound being small, you cannot bury the knuckles in it and reach the bladder as easily as in the larger lateral wound; and therefore, having done fifty to sixty cases by the median plan myself, and having had rather a higher mortality than by the lateral, I am not disposed to continue or advise it, except in particular cases; cases in which the stone is small, and in which, for some good reason, lithotripsy is not available. While, however, I should seldom resort to it, I must admit that I have seen a quite considerable number of instances of it in which recovery has been marvelously rapid; the urine has resumed its natural route almost immediately after the removal of the tube; the wound, instead of gaping and healing slowly as the lateral wound does, falls into accurate apposition naturally, and heals almost by first intention. All this, however, does not compensate, in my opinion, for the disadvantages just described. Some surgeons, I believe, still retain a preference for it, especially in children; but my observation and experience would lead me to say, avoid it generally, but especially in children, in whom, comparatively speaking, a free incision is necessary in order to facilitate the passage of the finger into the bladder, but in whom the limit of space for the knife is very small indeed.

Other methods of lithotomy have been practised; namely, the medio-bilateral; the recto-urethral or recto-vesical; various directions of the external and deep incisions; the combination of perineal lithotomy and lithotripsy, etc. These various proceedings have never found much favour in this country; and, as I have no personal experience of them, I may pass them by. The suprapubic operation I will speak of by-and-by.

Difficulties.—Let me, however, refer to some of the troubles and accidents which may occur during and after lithotomy. The staff may fail to touch the stone; this will seldom occur, but, should it do

so, a sound will probably at once detect it, and the operation may proceed. Should it, however, elude the sound, it will be right to postpone the operation for a few days. I have never had to do this, but I well remember that, in a private case of Liston's, the operation had to be postponed twice. This was annoying, seeing that preparations had been made, assistants had come some distance, and the patient and his friends were disappointed by the delay. On the third occasion, the stone still could not be felt by either staff or sound, although it had been clearly detected the day before. The operation was done. The patient was a large fat man, with hypertrophied prostate, and the finger could not reach the bladder; the forceps was used, but no stone was felt. Practically, however, two stones were unconsciously removed, so enveloped in a clot of blood, that they did not communicate any sense of touch to the operator. Once, and once only have I seen the bladder opened and no stone removed; but that case impressed itself on my memory, not only because of this awkward incident, but it was also the first case I ever witnessed at the Norwich Hospital. The surgeon, now deceased, was a good and experienced lithotomist, and after trying various instruments—I do not think he syringed the bladder, which would probably have washed the stone out—he desisted, and the stone came away with the urine a day or two after the operation. In this case, too, the stone was small; and I apprehend that the difficulty arose from its having got into some recess of the mucous membrane, or having been held by the muscular columns in a part which the finger could not reach, and enveloped in clot. These, however, are but curiosities of experience, and can but very rarely happen.

Encysted stone, too, is, happily, a rare occurrence; but, on looking through my notes, I find records of five cases in connection with lithotomy, and as many, or more, with lithotripsy, of which, however, I will not now speak. The mode of formation of cysts, or sacculi of the bladder, is too well understood to need explanation; they are due, in all cases, to obstruction to the easy outflow of urine, and by far the commonest cause of obstruction is enlargement of the prostate gland. When sacculation of the bladder co-exists with stone, this has been by some thought to be the cause; but, inasmuch as sacculation of the bladder very frequently, indeed generally, exists more or less completely in the bladder of old people whose prostate is enlarged, where no stone is present, so I conclude that the co-existence of stone and sacculation is only a coincidence, and that the utmost which can be said is that stone may add to the completeness of the sacculation by increasing the irritability of the bladder, and its vain efforts to overcome the prostatic obstruction. Moreover, stone in the young and middle aged seldom exists with sacculation.

The fact of the stone being in a sac or cyst can seldom be accurately diagnosed, but it may sometimes be shrewdly suspected. The pain is felt more in the bladder itself than in the glans penis; there will be unusual difficulty in finding the stone; and, when found, probably only a point of it can be touched, and it cannot be moved. This fact of always finding the stone at one spot, where it seemed to be fixed, has several times led me to make an accurate diagnosis, more especially if that spot were somewhere near the right ureter, which, I believe, is the most frequent place in which to find an encysted stone. If there be chronic cystitis, the point of stone which projects into the lumen of the bladder becomes covered with phosphatic deposit, so that there are two stones, one composed of uric acid, the other of phosphates, connected by a narrow neck; the phosphatic part is often broken off by the movements of the bladder, and again a fresh mushroom-like deposit of phosphates grows up from the broken neck; and in this way is explained the occurrence of one stone lying free in the bladder in addition to the encysted one.

In 1860, a man, aged 30, was cut by my colleague, Mr. T. W. Crosse, and a cup-shaped phosphatic stone was removed; it had clearly formed over some projecting surface, and, on searching, the finger detected a round smooth substance at the base of the bladder; its exact nature could not be made out, and it was left. The patient rapidly recovered, and remained well for a year. Symptoms of stone then returned, and he was again admitted into the hospital, by chance, under my care. One stone, which was free in the bladder, having been removed, the forceps then grasped the substance above mentioned, and, with very little force, it was extracted. It proved to be an encysted stone, covered only by mucous membrane; it was pear-shaped, about the size of the end of one's thumb, and had on it at one end a nipple-like process, which protruded through the opening of the cyst into the bladder. The stone lying free was composed of white phosphates, and that in the cyst of brown uric acid. The patient suffered nothing from the injury to the mucous membrane, and was almost well in a week. This, however, was not a typical case, although a very interesting one, and one the like of which I have never seen in museums

or read of in books. The mucous membrane was not, as in true sacculation, forced through the muscular wall, so as to be, as it were, outside the bladder; the patient was only aged 30; had, of course, no prostatic enlargement, and no obstruction to lead to sacculation. The stone, as I have said, lay directly beneath the lining membrane, bulging it up, and communicating with the cavity of the bladder by a narrow opening. I know not how to explain its mode of formation. These sacculi, however, although they are generally complete, and are formed of only the mucous membrane and peritoneum, in which case they may reach any size, larger by far even than the bladder itself, may, when small, consist of all the coats of the bladder. They may be numerous or single, large or small, and in any part of the bladder; but when they exist, and when, in addition, a stone passes down from the kidney, they form a very present danger, lest this wee stone should be entrapped in one of them. It is true that their communication with the general cavity of the bladder is small, and is almost closed by the interlacing muscular columns; but it is impossible to overlook the risk that, as the urine constantly passes into them, when there is distension of the bladder, so, every now and then, will a stone or piece of stone, no larger than a millet-seed, find in them a resting-place too, to the future trouble of the surgeon, and the probable ruin of the individual.

The records of surgery contain many instances of gallant encounters with these hidden calculi; too often they resist all attacks, and the surgeon has to acknowledge his defeat; and, when his resolute endeavours have been crowned with success, too often it has been at the cost of the patient's life. I have failed, as others have, in these cases; but two instances may be mentioned in which the stones were removed, because they exhibit points of interest, and perhaps hints, for the guidance of others.

In 1862, a man, aged 58, applied to me, having a piece of stone impacted in the urethra near the meatus; this was extracted, and he showed me other pieces which he had voided during the previous years; he had never had an instrument passed, and they were the product of spontaneous disintegration of a stone. In the bladder, there were indications of multiple stones. He was cut by the median method, and five calculi, weighing thirteen drachms, composed of urate of ammonia, were removed. He recovered, and remained well for six years; then his symptoms returned, he re-entered the hospital with persistent cystitis, and a small stone was detected. A lithotrite was used, but the stone could not be properly seized, and only some soft phosphatic matter was scraped off it. A second trial was made, but with no better result; the stone seemed to be fixed at the lower and right side of the bladder. He was again cut median-wise; the finger could hardly reach the bladder, owing to prostatic enlargement, but the stone was felt at the lowest part of it. Small forceps broke off portions of phosphates, but still I could just nibble with my finger-nail the small stem of an encysted stone embedded amongst the folds of mucous membrane. With a stick-sponge, well oiled and pushed up the rectum beyond the prostate, I could elevate and pull the bladder forwards, so as to reach the stone more easily, but not sufficiently to raise it out of its bed. A small forceps, however, grasped and brought it away with a portion of mucous membrane, sabulous matter, and mucus. It was dark-coloured, small, and had a narrow neck, with a fractured surface, from which the white phosphatic bladder-stone had been broken. The bladder was well washed out, and searched, but no more stone could be felt. He recovered fairly well, but, in a few months, his old symptoms recurred; he was examined with a lithotrite, and a soft stone was detected, just as before, on the right side of the bladder, and fixed, so that it could not be grasped. Feeling sure that this stone was encysted at that spot, and thinking that a little better approach to it would be obtained, I performed lateral lithotomy on the right side, with my left hand; it was awkward, but the bladder was quickly reached, and, with the utmost stretch of the right forefinger, I could just feel the point of the stone; the left finger could not reach it, and, with the right, the knuckles were so buried in the wound, that no instrument could, at the same time, be used. Forceps would not seize or even touch the stone, but I succeeded in slipping a narrow sharply curved scoop, along the back of the stone down into the cyst; then, finding the scoop had a good hold, by pulling it towards the perineum, and giving it a half turn, the stone was dislodged and brought into the wound, and easily caught by forceps. It was oval, pointed at one end, marked by slight circular grooves, where the mucous membrane around the orifice of the cyst had clipped it. This operation was followed by cystitis, and the discharge of some soft phosphatic matter, but he entirely recovered, did not have any recurrence, and died, some years after, of paralysis. The practical hints to be drawn from this case were: that cutting on the right side gave rather a freer access to the stone, and, also, that tilting up the

rectum and base of the bladder facilitated the operation. In the present day, we, perhaps, should use a rectal bag moderately distended, or, better still, should have recourse to the suprapubic operation. Dr. Humphry has recorded a case, almost the very copy of this, in which he met with the same conditions and the same position of the stone. He performed lateral lithotomy four times, but could not, on the last occasion, extract the stone. On the fifth recurrence, he resorted to the recto-vesical plan, and succeeded in enlarging the mouth of the sac, with a hernia-knife, and removed the stone with forceps; but, unfortunately, this entailed rupture of the cyst-wall, and death of the patient. Dr. Humphry also records another case, in which, at a second operation, he enlarged the opening into the sac, and extracted the stone with forceps, and complete recovery resulted.

The only other case with which I will trouble you was in a woman, aged 61, who came into the hospital two years ago. She had difficulty in micturition, owing to a thickening and swelling around the orifice of the urethra; this was clipped off with scissors, but still the pain and irritation remained; and, on sounding, a stone was felt lying free in the bladder, and in addition, there was a hard lump to be felt with the finger in the vagina, which I took to be a stone in a cyst. She was in a low weak state, and the urine was alkaline, thick, and foetid. The urethra was dilated, and the stone, lying loose, and about the size of a chesnut, was easily removed. Again using the finger, I could detect the encysted stone, and on trying to dislodge it, the part which projected into the bladder was broken off and removed. Then it was not easy to find the broken stalk, as it lay embedded in folds of membrane; but when it was found, I dilated the orifice of the cyst with the finger, and, guiding a narrow scoop into it, and at the same time tilting the stone up with another finger in the vagina, I easily drew it out of the sac, and removed it with forceps. The woman died of peritonitis in a week, and the *post mortem* examination showed that the bladder was rather thick and contracted; there were two sacculi, one as large as the bladder itself, communicating with it by a round aperture in the centre of the posterior wall; this sac was thin and sloughy, and was the starting point of the pelvic peritonitis which proved fatal; the other sac, much smaller, was that from which the stone had been removed; it was situated close to the right ureter; it contained some creamy pus, and the orifice had contracted, and bore no sign of my manipulation, nor were there any indications of inflammatory mischief around it. This is the only instance of genuine sacculation of the bladder and encysted stone in the female that I have met with.

These cases, with a few others like them, which I have met with but have not now described, are numerous enough to form almost a class, having many features in common, and worthy of being specially noticed, because they will probably occasionally occur to those who may be frequently called on to treat cases of stone.

They differ entirely from those in which the stone lies embedded and fixed in a recess or pouch; the true cyst which I have been describing is a hernia or protrusion of the mucous membrane between and through the muscular fibres, but the pouch is simply a bulging of the entire bladder-wall in some direction, in which hollow a stone, frequently a large one, is fixed and embedded. This is sometimes seen in women, when the bladder wall and stone are more or less prolapsed towards the vagina; or, in men, when the stone lies almost fixed in a pouch behind an enlarged prostate; such a case, for instance, as that described by the late Mr. Southam, in which he successfully removed a very large calculus from this situation by the recto-urethral operation.

Wound of the rectum is an accident which, I suppose, has occurred to all lithotomists; generally it betrays a fault on the part of the operator, but it may be an unavoidable incident due to sloughing, following the extraction of a large stone. I have sometimes traced it, I believe, to the pressure caused by a plug used for restraining hæmorrhage; and it is more liable to occur during the median, than during the lateral operation. The surgeon who wishes to avoid this fault, should observe caution on three points: namely, to guard the bowel with the left forefinger as much as possible; to direct the staff to be well hooked up against the pubic arch during the deep incision, and to lateralise the edge of the knife well and cut away from the bowel. Against this last rule I am disposed to accuse myself of having offended; and when we remember how the old surgeons speak of directing the first incision towards the left hip, and of their sometimes cutting the trunk of the pudic artery, I am led to think that they kept more clear of the rectum than we do now. The part most in danger is the ampulla, just above the internal sphincter; and, seeing how close is the anatomical relation of the two canals, we ought not to be too quick to attribute blame or express surprise at the occasional occurrence of this accident. I have only one hint to give by way of remedying this mishap: namely, to wait for a long time before resort-

ing to caustics or to division of the sphincter. Nature seldom fails to bring about a cure, or so to contract the wound as to leave but trifling inconvenience.

Perforation of the bladder.—I have twice witnessed this accident, once by the elbow of an assistant striking the handle of the staff while the anklets were being locked, and so driving its point through the posterior wall; and a second time, by either the point of the staff or the knife being carried too far across a contracted bladder. The accident has been attributed to the rough use of the forceps; but this, if it ever happen, must surely indicate a degree of violence that could only be used by a wild and nervous operator.

INGLEBY LECTURES ON SOME FUNCTIONAL DISORDERS OF FEMALES.

Delivered at Queen's College, Birmingham.

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LECTURE II—(concluded).

BEFORE proceeding to consider some of the details of this subject, let me ask your assent to certain postulates of a general character. These will serve the useful purpose of helping in the distinguishing of hysterical cases one from another. Let it be granted, then:

1. That any nerve-centre (that is, any collection of grey nerve-matter) may have its excitability exalted, so that it becomes unusually responsive to its accustomed stimulus.
2. That any nerve-centre may have its excitability lessened, so that it becomes less than usually responsive to its accustomed stimulus.
3. That the permeability of any part of the nervous system may be increased.
4. That the permeability of any part of the nervous system may be diminished.
5. That increased permeability may cause ganglia to co-operate which do not usually do so. That is, that excitement of one ganglion may excite the action of other ganglia which, under other circumstances, it would not excite.
6. That diminished permeability may have the contrary effect, so that ganglia which usually act consentaneously, may cease to do so.
7. That any one or more of the cerebral ganglia which usually co-operate may be thrown out of gear, so that it, or they, cease to co-operate with the rest.
8. That the ganglia not thrown out of gear continue to co-operate as usual.

It may be that nerve-trunks have their sensitiveness or excitability increased or diminished. I do not propose either to deny or to affirm that this is so. The result would be the same as if the centre with which they are connected were affected.

Let us turn, now, to the consideration of some diseases commonly termed hysterical; and, first, to a common form of hysterical paralysis.

The patient has lost, almost completely, the power of moving one or more limbs—almost, but rarely quite completely; for I can recollect only one case in which no power of movement remained. The motions which do remain are, although extremely limited in area, yet often of considerable complexity. Such a paralysis, though remaining constant for weeks or months, or even years, may yet disappear in an instant, under the influence of sudden and violent mental emotion—such, for example, as an alarm of fire. Hence it has very properly been termed functional, as distinguished from organic. How are we to interpret this curious phenomenon? It was long ago suggested that we should look upon it as a paralysis of “the will;” and this view is still pretty generally current.

Without raising abstruse metaphysical questions, I fancy that, in speaking of the “will,” we commonly include two separate and distinct ideas—one, the idea of a wish to do something; and the other, of our power to give effect to that wish. If we consider “paralysis of the will” by the light of this analysis, we come to this result: firstly, that, in regard to the second idea, it is a mere clothing, in pseudo-scientific phraseology, of the fact that the patient has lost the power of voluntarily moving her arm or her leg. It contains no explanation of this fact; and, therefore, conveys none. It is, in short, a

meaningless phrase. Secondly, as regards the first idea, it is untrue in fact. These patients, so far as I have been able to understand them, have a very strong wish to be able, and are deeply distressed by their inability, to move the limb. They are also extremely grateful to us when we have cured them. To arrive at a more adequate interpretation of these cases, we must go some way round, and consider subjects which may, at first sight, appear remote. Nature is, in some cases, not content to leave the activity of a nerve to be regulated by the greater or less amount of force emitted by its ganglionic centre. A second nerve, arising from a different centre, is told off to diminish, or even arrest, its action. Such superior nerves are called, as you know, “inhibitory” nerves; and the control which they exercise is called “inhibition.”

It is not difficult to perceive that this method is employed in the highest departments of the nervous system, as well as in the lower ones. We find evidence of this operation in connection with the high cerebral ganglia, the organ of the mind, as we call it. In the passage, “Thou shalt renounce, thou shalt renounce, thou shalt renounce—this is what the whole world is hoarsely crying to thee,” “inhibit” might be substituted for “renounce,” without any alteration of the meaning. An inhibition of this kind, which at first requires a voluntary effort, acquires, by frequent repetition, an involuntary or automatic character. Most of us can see a desirable object in the possession of another, without any nearer approximation to an intention of annexing it, than is contained in “I wish I had one like it.” In the child, this inhibitory power is, at best, but latent, and requires, for its development, moral and social education. In some children it is difficult to develop it, even when the reasoning-powers are indirectly stimulated by irritating applications to the peripheral nerves distributed to the skin covering the gluteal muscles. In some few, it appears to be absolutely non-existent; we hear of individuals in whom the reflex act of taking is, all their lives through, the inevitable result of the act of seeing a desirable object. Some little mass of grey, or some slender thread of white, nerve-tissue, is wanting. The same thing is seen in some savage races, who are incurable pilferers.

We find, in another set of circumstances, something even more directly bearing upon our subject. We have most of us, at some, now probably remote, period of our lives, run up to a hedge with the intention of jumping over it, but, not “liking the look of it,” stopped short, without making a spring. This is a rational and intelligent act, though it may afterwards be evident that it was a mistaken one. We have, also, similarly run up and made a spring, but, at the same moment, allowed the principle inelegantly called “funk” to intervene, with the result of inhibiting our muscular action, and thereby “bringing us to grief;” while a second, more confident—that is, an uninhibited effort—has carried us safely over. The secret of what is called “Dutch courage,” lies partly, at all events, in the fact that one great effect of alcohol is to relax or paralyse inhibition. To this, mainly, is to be attributed the loquacity of intoxication; and so is the proclivity to the committal of crimes, by persons under the influence of alcohol. Examples of the higher forms of inhibitions are common among animals. Most of the tricks taught to dogs depend upon it. The exertions of a horse who has, on some previous occasion, been severely flogged, are, in some cases, inhibited by his hearing the sound of a whip raised to strike him.

Let us now turn to an entirely different class of phenomena. Under certain circumstances, those parts of the nervous system which usually, and, for useful purposes must, act in concert, cease to co-operate, one portion remaining active, while another portion is in a state of suspended animation. This is what happens spontaneously in sleep-walkers. A similar condition is producible artificially by means of mesmerism, hypnotism, and the like. In some instances, there has, no doubt, been fraud and imposition practised by unscrupulous performers; but, the most liberal abatement having been made on this score, there remains a series of facts of the most interesting description. If you or I were told that we could not lift from the table a pocket-handkerchief because it was so heavy, we should at once confidently proceed to show that we could. Why? Well, to put it shortly, because we should believe our experience, and disbelieve what we were told; but, if a hypnotised person were told the same thing, he would be unable to lift it. Why? Well, again, to put it shortly, because he would believe what he was told, and would be unable to correct the statement by reference to his experience, in consequence of some portion of his brain being out of gear; and something like this, I submit, happens in hysterical paralysis, in which, on this theory, the primary cause would be not deficient, but excessive, nerve-action. Muscular action is inhibited by the belief that it is impossible. A principal element of cure, then, is to con-