

**MARCH (ALDEN)**

*The same in N. W. 104*

ON

INTRA-CAPSULAR FRACTURE OF CERVIX FEMORIS

WITH BONY UNION;

AND

AN INTERESTING CASE OF URINARY CALCULI,

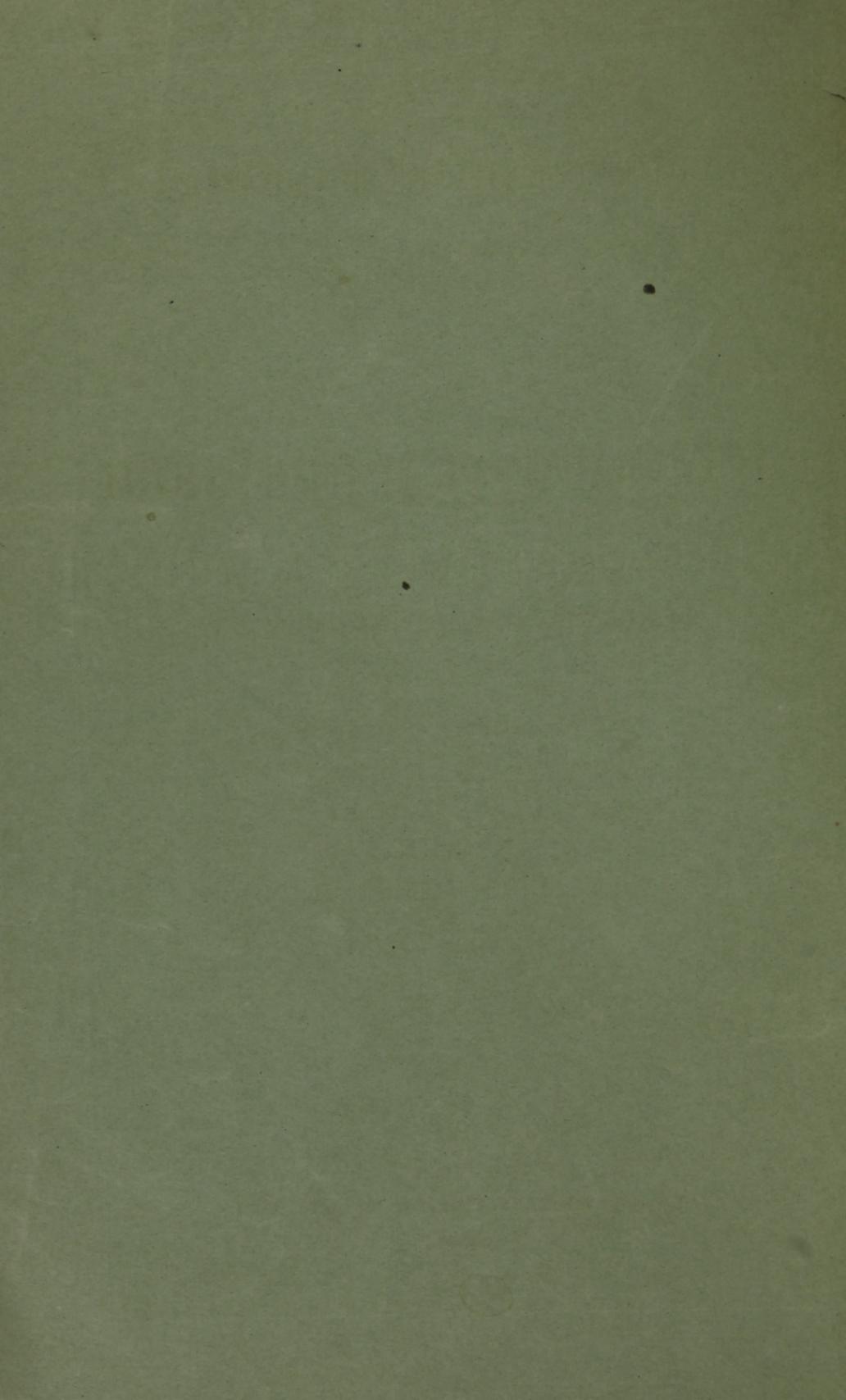
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BY ALDEN MARCH, M. D.  
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1858.



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*Presented by  
J. H. Ambley*

AND

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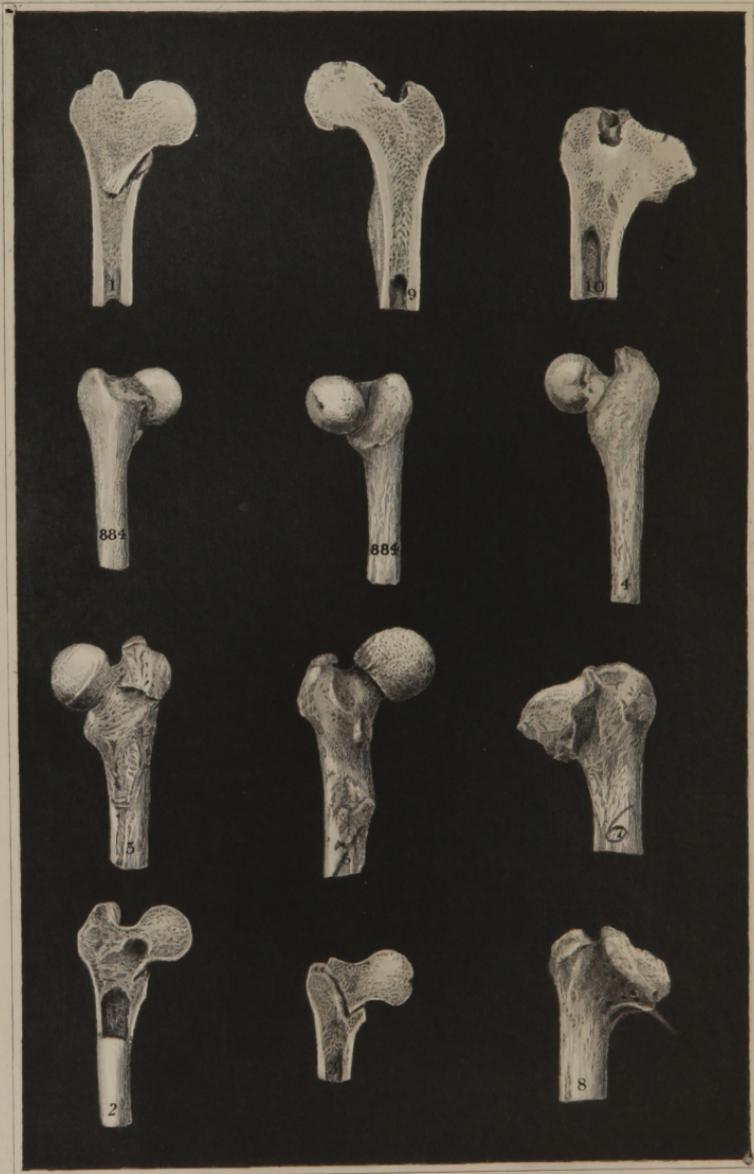
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### Explanations of Plate 3, on Intra-Capsular Fractures.

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FIG. 1, 2, 3, are good specimens of impacted fracture external to the capsular ligament.

FIG. 4, simple extra-capsular fracture united with the head depressed a trifle below the top of the trochanter major, and turned backwards; and presenting an anterior angular ridge, as is seen in No. 884, and in No. 6

FIG. 5, extra-capsular fracture of neck, and fracture of trochanter major.

FIG. 6, anterior view of entire specimen of intra-capsular fracture.

FIG. 7, fellow of No. 6, from the same subject, in its normal condition, or nearly so.

FIG. 8. posterior view of No. 6—the dark appearance on the neck shows the capsule in a dried state.

FIG. 9, 10, bisection of 6 and 7, showing a strongly marked difference in the structure of the interior of the normal and fractured specimens.

FIG. 11, 12, marked on the specimens 884, an anterior and posterior view of intra-capsular fracture with bony union, procured in London.



## OSSEOUS UNION OF INTRA-CAPSULAR FRACTURE OF THE NECK OF THE FEMUR.

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A few words of description of the anatomical structure of the head, neck, and ligaments of the femur, before we enter upon the consideration of the subject of fracture, and chronic rheumatic arthritis, or interstitial absorption, will be required, that we may properly appreciate the full merits of our subject.

All that part of the bone, surmounted or covered with cartilage, may be called the *head*. It is globular, embracing rather more than half of a sphere, and terminates towards the shaft in a somewhat wave-like, or irregular circular line, sometimes called the *corona*.

The neck of the bone sustains the head; and in its turn is supported on the shaft, and stands off from it at various degrees of obliquity, according to age, sex, &c. Its length and thickness are quite as variable as its position. In the normal condition, the highest point of the head ascends above the highest point of the trochanter major, from half to one and a fourth of an inch.

There appears to be no difficulty in fixing the boundary of the *neck* anteriorly, or rather inwardly, towards the acetabulum. Outwardly, or towards the shaft, it is bounded by the inter-trochanteric line, where it is broader and flatter than in the centre, or than where it is united to the head. It is united to the shaft obliquely, so that the inferior is longer than the superior part.

For our present purposes we need not describe the shaft, trochanter major, trochanter minor, nor the acetabulum. It is proper, however, for us to briefly consider the situation of the ligaments of the hip joint.

The ligaments connected with the hip joint are five in number: capsular, ilio-femoral, teres, cotyloid, and transverse.

The capsular ligament and the ligamentous processes or slips, sometimes called *cervical* ligaments, which run up from the base of the neck to the head, on its under and back part, will be all we shall have occasion to refer to in the farther consideration of our subject.

It is a matter of some importance to define accurately the attachments and extent of the capsule. For the question of deciding whether a given fracture be altogether within, or partly within and partly without, the capsular ligament, will often depend upon the *precise point* of location of its attachments.

The ligamentous capsule embraces, or is attached to the margin of the *acetabulum* superiorly, and inferiorly and anteriorly to the inter-trochanteric line,—superiorly and posteriorly to the neck of the bone just within the *trochanteric* or *digital fossa*, and within the posterior *inter-trochanteric line*, or lip of bone extending from the *trochanter major* to the *trochanter minor*.

Wilson says the capsule “extends further upon the neck of the femur on the *anterior* and *superior*, than on the *posterior* and *inferior* side, being attached to the inter-trochanteric line in front, to the base of the great trochanter above, and to the middle of the neck of the femur behind.”

Judging from a number of specimens I have examined, and from those herewith submitted for inspection, it would appear that the capsule is not attached “to the middle of the neck of the femur behind,” as above quoted from Wilson’s System of Anatomy. If the capsule were attached to the *middle of the neck*, then indeed we apprehend it would seldom happen that we should meet with fracture altogether within it.

The neck of the bone is provided with periosteum, and those dense cervical tissues or ligaments before referred to, and are useful in preventing displacement in case of complete fracture, and must be further considered in relation to the subject of partial or incomplete fracture, as advocated by some authors.

Those who have been disposed to follow the lead of authority so high and controlling as that of the late Sir Astley Cooper, in

denying that bony union can take place, when the fracture is *complete* and *altogether within* the capsule, are disposed to recognize a partial fracture of the neck, or to locate the attachment of the capsule much nearer the head than where it is ordinarily met with.

Mr. Colles and Mr. Adams, of Dublin, are advocates of the doctrine of partial fracture of the cervix. Robert Wm. Smith, of the same city, in commenting upon the views of these gentlemen, says: "However ingenious the remarks may be considered, they certainly afford no evidence of the occurrence of such an accident as a partial fracture of the cervix femoris."

The cases called *partial fracture* by Colles and Adams, Mr. Smith is disposed to regard as *impacted* fractures.

I believe that there are very few, if any, who would admit the occurrence of *partial* fracture of the shaft of the cylindrical bones of the extremities in *adults*, and much less so at an *advanced period of life*.

Mr. Smith adopts the following reasoning in relation to this subject. He says: "It would be very difficult to account, satisfactorily, either for the *shortening* of the limb, or the *rotation of the foot outwards*, as long as we suppose the posterior part of the neck of the bone unbroken; in my opinion, (he continues,) the presence of shortening necessarily implies, that if there be any fracture of the neck of the bone, it must be complete. No one surely, (he adds,) would be disposed to maintain that the thin stratum of the compact tissue which covers the posterior part of the cervix femoris is *likely to bend*, and thus to yield without breaking, in an old person, to a force which fractures the remainder of the neck of the bone; and yet, it is obvious that it must either bend or break, before retraction of the limb can occur."

After fully discussing the doctrine of partial fracture of the neck of the femur, as advocated by Messrs. Colles, Adams, King, Tournel, and others, Mr. Smith says, "The theory of partial fracture of the neck of the femur, is one that is interesting, both

to the pathologist and to the practical surgeon, and is of some importance that its truth or fallacy should be established. For my own part," continues Mr. Smith, "although I may have failed to convince the judgment of others, I am satisfied that the doctrine has not yet been proved to be correct; nor have I arrived at this conclusion hastily, but after having given to the subject that degree of consideration which is due to the opinions of the distinguished authors referred to as the supporters of the theory."

I shall advocate the doctrine of *complete fracture within the capsular ligament and union by ossific deposit, without impaction*. If broad, rough, and even serrated surfaces, do not constitute an *impacted fracture*, which they do not, according to the definition of the best of authority, then I think we must look for other means by which the fractured surfaces are maintained intact, in intra-capsular fracture of the neck of the femur, where bony union has been observed.

We shall next examine the points of difference in the organic changes of the parts of the hip joint when produced by violence and mechanical lesion, and those abnormal appearances which result from morbid action, supposed to depend upon a rheumatic diathesis, and often observed in the hip joint of persons at an advanced stage of life.

The changes in the head and neck of the femur, which result from severe contusion, as have been explained by Sir Charles Bell, from chronic rheumatic arthritis, and from disease in old bed-ridden persons, have been thought to resemble the appearances of *intra-capsular fracture with bony union*. The change of form and position of the head of the bone and shortening of its neck, is called by some *interstitial absorption*.

These wonderful changes—in some instances, a great carrying away, or loss of substance in one direction and accumulation in another, are due to the action of the secernents and absorbents; or in other words, to the *interstitial and progressive absorption*, and to friction after absorption of the cartilaginous surfaces.

The neck is shortened, or altogether carried away—the head may be *flattened* and *broad*; or it may be *conical*; and in both cases greatly *depressed* or *sunk below* the highest point of the trochanter major, and in all instances, *looking downwards* and *inwards*, exhibiting no *angular distortion* antero-posteriorly, as is pretty generally the case in fracture of the neck of the femur. In all cases of fracture of the neck of the femur, except in *impacted*, the head of the bone *looks backwards* and *downwards* while the shaft is *everted*, so that when union takes place whether within or without the capsule, a *convex angle* presents *anteriorly*, and a *concave angle* *posteriorly* at the seat of the fracture.

The following seems to be the characteristic marks by which a fracture united by bone can be distinguished from the great variety of abnormal changes in the condition of the head and neck of the femur, as observed in *chronic rheumatic arthritis*, or interstitial absorption at some points, and bony accumulation at others. In the latter, the head of the bone has *always* undergone change of *form, size* and *condition of surface*. It may be broader and flatter in its entire circumference, or flattened at the top\* or it may be pointed or conical, and some portion of it is always deprived of its cartilaginous covering. In the former, the head of the bone does not necessarily become either flatter or broader, pointed or conical, diminished in one or increased in another direction, nor even deprived of its cartilage.

In arthritic subjects, who meet with fracture at an early or middle period of life, and live to old age, morbid changes may be the result of chronic rheumatic arthritis, distinct from and independent of the fracture, and developed at a period quite remote from the occurrence of the fracture, as I shall endeavor to demonstrate in the case I am about to report.

The changes produced by chronic rheumatic arthritis are pretty uniformly met with at an advanced period of life. So, too, is intra-capsular fracture almost peculiar to old age, but not

\* As in case No. 2, figure 4, of Prof. R. D. Mussy's recent publication of "Fractures of Neck of Thigh-bone."

See American Journal of Medical Sciences, for April, 1857.

absolutely so ; as the recorded cases, and also the one I am about to present, will fully prove.

I believe that in all fractures of the neck of the femur, whether *intra* or *extra* capsular, (with the exception of the *impacted*) *angular distortion*, (anterio posteriorly) is *always* clearly marked. The projecting ridge, or more or less sharp angle in front, is due to the separation of the fragments ; and when bony union exists, to the deposit of new material in the space, and to the projection of the compact outer shell of the fragments ; and by the action of the rotator muscles of the hip, the limb is *everted*, which contributes to widen the fissure anteriorly at the seat of fracture, This space is filled up with bony deposit, and hence the angle is permanently maintained. While at the posterior site of the fracture, the compact surface of the bone may be intact, the fractured surfaces firmly resting upon each other, and there maintained by the very means that produced the separation or fissure in front.

Mr. Smith, from whose work we have before quoted, says, that “ in a great majority of cases of intra-capsular fracture, the posterior portion of the cervical ligament remains uninjured, and that large fragments of the compact tissue of the corresponding part of the neck of the bone, are *frequently found adhering to it.*”

All this I conceive to be most clearly consistent with the existence of *complete fracture absolutely within the capsule, and ossific union, without the aid of impaction.*

We think the question of osseous union of intra-capsular fracture of the neck of the femur, need no longer be regarded as a debatable one. The well-authenticated cases of Mr. Langstaff, Brulatour, Stanley, Swan, Adams, Jones, Chorly, Mussey, and many more that could be collected from the records of modern periodicals, would be sufficiently conclusive to settle the question. The *age* of the respective patients ; the *time* of the injury ; the *symptoms* ; the *length* of time they survived after the accident ; and the *post-mortem appearances* on dissection, are all accurately recorded. The age of the patients varied from eighteen to eighty. In some the symptoms of fracture were well marked

by shortening and eversion of the limb, and by *crepitus* ; and in others, some of the characteristic symptoms were wanting.

The patients survived the accident from five weeks to ten years ; and in all instances the post-mortem appearances are described, and most of them represented by wood cuts, in Smith's Treatise on Fractures, in the vicinity of the joints.

I hope to be able to add to the above, and to the contributions of this part of surgical science, my testimony in proof of osseous union of intra-capsular fracture of the neck of the femur, by presenting a description and exhibition of the following cases.

The evidence of the existence of a fact, and the influence it will have on the minds of others, will depend on the demonstrative proof in the thing itself, (if it relates to a material, tangible object,) and on the intelligence and credibility of the witnesses or narrators of the circumstances relating to such fact.

Dr. Abercrombie says : " In the acquisition of facts, we depend partly upon our *own observation*, and partly upon the *testimony of others*. The former source is necessarily limited in extent but it is that in which we have the greatest confidence ; for in receiving facts upon the testimony of others, we require to be satisfied not only of the *veracity* of the *narrators*, but also of their habits as philosophical observers, and of the opportunities they have had of ascertaining the facts.

" In the degree of evidence which we require for new facts, we are also influenced by their probability, or their accordance with facts previously known to us ; and for facts which appear to us improbable, we require a higher amount of testimony, than for those in accordance with our previous knowledge. This necessary caution, however, while it preserves us from credulity, should not, on the other hand, be allowed to engender skepticism ; for both these extremes are equally unworthy of a mind that devotes itself with candor to the discovery of truth."

So far as I am concerned personally, in establishing the fact of osseous union in case of *complete non-impacted intra-capsular* fracture of the neck of the femur, I need not attempt to forestall the favorable opinion of the medical public.

It would be unbecoming in me, or any one else, who makes any pretensions to modesty, to speak of superior advantages for acquiring knowledge, and of many years of practical observation in the treatment of diseases, and lesions of the hip joint. Suffice it to say, that I stake my reputation, be it more or less on the accuracy and truthfulness of the facts I am about to present. The testimony of others also, connected with the history of the case, rests on as sure a basis as that of my own observation and demonstration. All the individuals to whom I shall refer, are intelligent and honest, and several of them occupy a high position in society.

Of the two specimens here presented for examination, as examples of intra-capsular fracture of the femur united by bone, the smaller one, numbered 884, was procured in London, some years since, and at that time, was regarded by the curator of the old London Hospital Museum, as a good specimen of fracture and bony union of the neck of the femur within the capsular ligament. I can give no history of the patient, or subject, from whom it was taken. I think it could not have belonged to an old person ; and it is quite clear that he or she, as the case may be, lived long enough after the occurrence of the fracture, for it to become thoroughly re-united by bony material.

The neck of the bone is very much absorbed, which will be found to be the case in almost all instances of intra-capsular fracture, whether united by bony or ligamentous material. This specimen, with several others of various kinds of organic change, was submitted to the examination of an able Professor of surgery, who has recently devoted much attention to the study of fractures, and who remarks upon it as follows : “ Specimen 884, is plainly enough a *fracture*, and I think there can be no doubt, that on one side of the neck the fracture was within the capsule ; but I have no means of determining whether it was also within the capsule on the opposite side, since the neck is almost completely absorbed.”

On close examination, it will be found that about all the part of the bone that can be called *neck*, is connected with the shaft, and that the fracture appears to be nearly transverse, and close

to the *articulating*, or cartilaginous border of the head. It strikes me that it is just as clearly *altogether within* the capsule as it is a fracture.

The accompanying cast of a similar specimen, seems to be equally demonstrative of the three *points* so strongly marked in specimen eight hundred and eighty-four, viz. : *complete fracture, altogether within the capsule, and bony union.*

The large bi-section of a more recent specimen, was procured about three years since, the description and history of which is as follows : The subject from whom the specimen was taken, was a large framed man, about fifty-eight years of age at the time of his death. I think I must have known the person twenty-five or thirty years. His gait was peculiar—a kind of *side waddle*—one limb appearing to be two or three inches shorter than the other, and with the hip of the shortened side greatly projecting laterally.

When the two sections are replaced, and on looking at the head of the bone, it will be observed, that a pretty large surface at its upper part, and towards the trochanter major, is a little flattened, and has the appearance of having been worn away, deprived of cartilage, and becoming ebonated, or presenting at one point a *porcelaneous polish*. This change I regard as the result of *interstitial* and *progressive* absorption, aided by *attrition*, and as having occurred at an advanced period of life.

The ridge of bone on the anterior and superior part of the neck, where I suppose the fracture existed, is still covered with a portion of the dried capsular ligament. At the back and inner part of the head, there is a portion of cartilage to be seen, of a brown color, and thinner than natural. That part of the head occupied by the ligamentum teres, seems to have been getting into a state of ulceration, but how long before death I cannot conjecture. Most of the cartilage of the head of the femur, on the other side, is absorbed, and its surface more or less polished. In the specimen of this, in the right side of the same patient there appears to have been a fracture in the shaft, about two or

three inches below the trochanter minor, which was united without much distortion.\*

If we continue the examination of the bisected specimen—that of the left limb—after replacing the sections, it will readily be observed that the *head* of the bone has been *depressed* and *turned obliquely* backwards—in these respects occupying almost precisely the position in which we find the *head* of the bone situated in specimens where no doubt can be entertained as to the existence of fracture through the neck, as two or three of the accompanying specimens will prove.

This distortion of the head, or altered relation between it and the shaft of the bone, is due to the action of the muscles that carry the shaft, and the portion of the neck attached to it upwards; and those that evert it, or roll it outwards.

The long spine or rib of bone extending upwards and inwards was found imbedded in the tendons of the psoas and illacus muscles; and seems to have its attachment at its base, to the point where we should look for a trochanter minor.

In comparing the inner face of the sawed specimen with Mr. Jones' case, a wood cut of which is given in R. W. Smith's work on Fractures, at page 63, we shall see that the appearances are almost identical.

\* There was also some distortion of the pelvis, which I supposed might have been due to the violence which produced the fracture of the neck of the femur of the left side. The ala of the ilium on the right side was incurved, apparently bent in towards the centre of the base of the sacrum, so that the distance from the crest to the centre of the sacrum was three-fourths of an inch less than on the opposite side.

On farther reflecting upon the subject, after learning that the boy merely fell from the shed, instead of being crushed by the falling of the shed upon him, as I had been led to believe, I am disposed to regard the distortion in the upper part of the shaft of the right thigh bone, and the distortion of the ilium, as the result of a yielding of these parts while the bones were vascular, and abundantly supplied with animal material, to the weight of the body, and to the strong action of the abdominal muscles on that side, and to those of the inner and upper part of the thigh, to support and to maintain the vertical position in the act of locomotion.

The curvature of the upper part of the femur and the spine or ridge bone, on its posterior arched face, is only what we often see in the long bones of the lower extremities of sickly persons, and seems to be the provision which nature makes in the shape of a brace or girdle, to sustain the weakened and yielding shaft against the further effects of sustaining weight.

Thus much for the occular demonstrative proof of the existence of a former fracture, and after giving the historical facts connected with the accident, at the time the fracture was produced, we shall then undertake to demonstrate, that it was *complete* and *altogether intra-capsular*. If we succeed in establishing these two points, the third, that of *bony union*, we conceive to be self evident.

Fred. L——, the subject of our morbid specimen, according to the alms house record, died May 18th, 1854, aged 60 ; although it is believed that he was not as old by some two or three years.

I instituted enquiries of a great number of our old citizens, as to the *cause* of "Fred's" lameness, and the *time* of its occurrence. I shall select only a few from the large catalogue ; those that appear to be the most definite, and to the point.

A——C—— aged 70, a colored woman, born and had always lived in Albany, knew "Fred" and his mother well, when she (the witness) was young, and then a slave. When he the said "Fred," was a mere lad, she knew him to be lame and about as much of a cripple as at the time of his death ; also, that he (Fred) had informed her that a shed fell upon him, or that he fell from a shed and injured him severely in the hip, and that was the cause of his lameness.

W——H——, a very reputable colored man, over 70 years of age, had known "Fred" many years ; and from his earliest acquaintance knew him to be a distorted cripple.

Mrs. S——, the wife of a late distinguished citizen and statesman, now 83 years of age, says, she knew "Fred" from childhood until near the time of his death. She very well remembers when he broke his hip or upper part of the thigh bone ; and thinks that he could not have been more than ten or twelve years of age at the time, as she was in the habit of seeing the nurse, or woman who took care of him, carry him up and down stairs on her shoulders during his confinement with the injury ; and also immediately after getting about ; and that he was just

about as lame, as much of a cripple, and as much distorted in his figure as he was at any time previous to his death.

Mrs. L— H—, 83 years of age ; now, and at the time of Fred's birth, a resident of Albany—says, she was intimately acquainted with the family in which Fred was raised ; remembers well the time when Fred broke his thigh ; knew the physician who attended him ; and thinks he could not have been more than twelve or fourteen years of age at that time. She also knew that he was from that time, and ever after, lame ; one limb being much shorter than the other ; and that he continued to be a cripple as long as he lived.

But the testimony of the following two witnesses is as clear as to *time* and *place*, as incontestible proof can possibly establish any given fact.

Mr. G— D—, now about 57 years of age, and one of our most respectable citizens, was with "Fred" at the time he fell from the shed, or the shed fell upon him, and very distinctly remembers the time and place of the accident ; knew of his having been attended by a physician for a broken thigh ; and, also, has known him ever since to have been a great cripple, with the left limb much shorter than the right.

J— D—, Esq., the senior of the above eye-witness to the accident, saw "Fred" the next day after he was injured, and knew that Dr. James Low, a talented and well educated surgeon, attended him for a fracture of the thigh.

Now when we come to consider the history of the case, and compare the left *morbid* with the right normal specimen, and observe how strangely and strongly marked the contrast is, in relation to the *head, neck, trochanters* and *shaft* of the two bones, it seems to us that the proof of the existence of fracture at an early period of life is absolutely conclusive.

The proof of its being a *complete fracture*, and not *impacted*, is to be found in the *great shortening* of the limb, and in the *angular* and *rotary distortion*.

The evidence of the fracture being *intra.capsular* is to be found in the existence of the original attachment of the capsular ligament, anteriorly and posteriorly, in a dried state, and may be easily examined by any one who may see fit to do so.\*

The American Professor of Surgery, to whom reference has been made, and to whom I presented the specimen for examination, together with a detailed description of it, as well as a partial history of the occurrence of the accident, which resulted in the fracture of the neck of the femur, as I allege at an early period of life, disposes of the whole matter in the following laconic language: "I must concur with Dr. A—— in believing that specimen No. 1 is simply an example of chronic rheumatic arthritis, or interstitial absorption."

Now I submit whether the *importance* of the *subject*, the *strong points* in the case, and my own professional reputation were not entitled to at least a *show of reasons*, or a *single reason*, for the above belief.

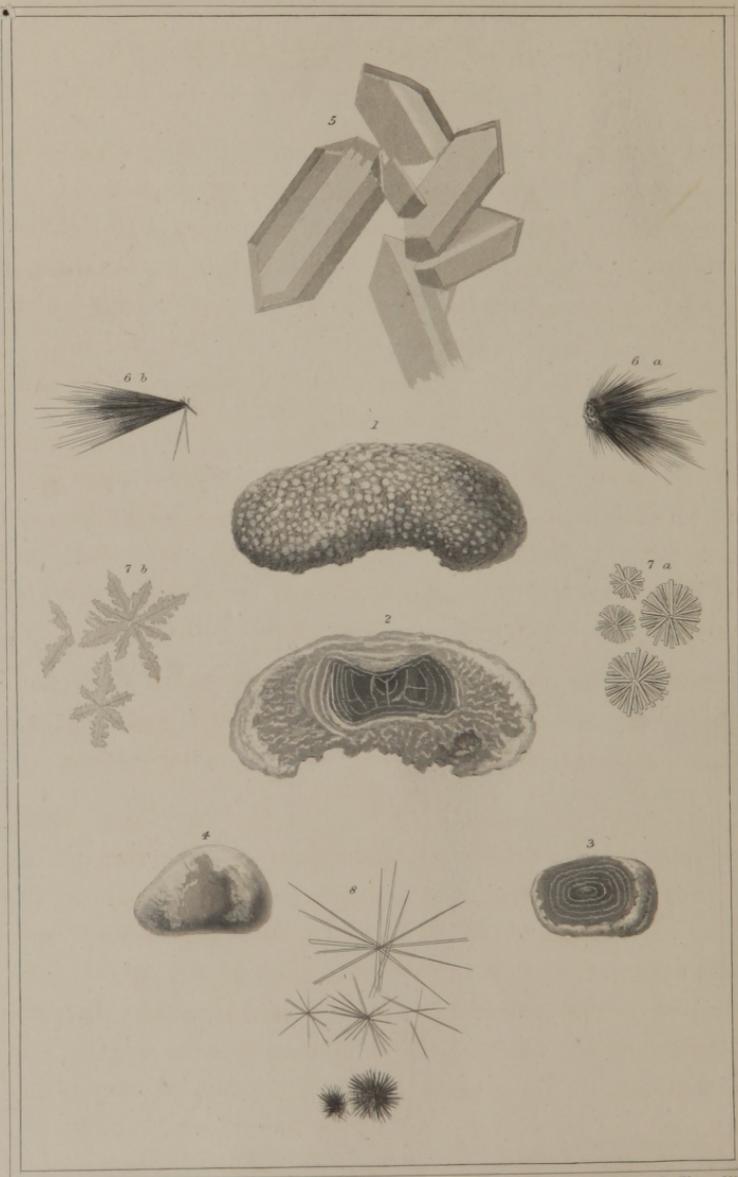
I wish the profession to examine the specimens accurately, and minutely, in every respect. And deeply do I regret the uncertainty of getting a good representation of them on paper, so that the subject might be more extensively circulated and examined.

I am content, however, to submit the whole subject to the decision of competent judges, to decide whether the facts are not sufficiently *numerous*, *clear*, and *convincing*, to warrant the conclusion at which I have arrived.†

*Albany, N. Y., April 25th, 1857.*

\* After exhibiting the specimens, and submitting the evidence of the occurrence of fracture of the femur in the person, the history of whose case I have given, to a medical friend, he argued that I had made out quite a strong case, unless, perhaps, it might be allowed that the boy was lame and a cripple before he fell from the shed. In legal "tactics" this might be regarded as a "loop-hole" through which the opposers of the doctrine of "bony union" of fracture of the neck of the femur within the capsular ligament of the hip joint might escape. Fortunately I have been able to settle this point by making enquiry of those who were his play-mates before the accident; and who inform me that no boy was more active, or freer from lameness than "Fred."

† This paper was prepared with the expectation that it would be presented, accompanied by the morbid specimens, for the consideration of the American Medical Association, at its last session. But on arriving at Nashville, I learned that some objections were made to the exhibition of a pathological specimen presented at the previous meeting, held at Detroit, by a distinguished member of our State. I concluded not to offer it, nor make a public exhibition of the specimens.



Nos. 1234 Calculi- 5 Triple Phos. Magnesia- 6 a & 6 b Urate of Ammonia.  
7 a & 7 b. various forms of Triple Phos. Magnesia- 8 Urate of Lime.

*John E. Cassin, Jr. Albany, N.Y.*

## CASE OF URINARY CALCULI.

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The chief points of interest presented in the following case, are, the great age of the patient; the number of calculi; the dissimilarity in the chemical composition of the calculi, spontaneously voided, and the larger and *outer* portion of that extracted by operation; the similarity or *identity* in chemical composition, of the *center* of the large calculus, removed by the operation of lithotomy, and those previously passed spontaneously; and, finally, the happy result of the operation.

Mrs. J——, aged eighty-seven, the person whose case is to form the subject of our paper, has resided in this State for many years; and, without doubt, has been blessed with an “iron constitution,” both mentally and physically, as we should be led to infer, from her present enjoyment of “a green old age.”

The history of the case is exceedingly brief, and I shall present it in the language of a near friend of the patient, from whose letter upon the subject, I select the following extract :

“For six weeks, or longer, previous to the middle of April, 1857, she had ceased to enjoy her usual good health; and during that time, she suffered once, for several days, from pain in the loins. The 14th of April, 1857, she was attacked, rather suddenly, with an intense pain in the lower part of the trunk, (she thinks, in the lower part of the back,) and the next day, she voided fifteen urinary calculi. After this, she soon rallied, and was very comfortable for a week or so. Then the painful symptoms returned, and constantly increasing in violence, continued till she was effectually relieved by the operation.”

As the author of the letter, from which we have taken the above extract, is not a medical man, it is to be presumed that he was not aware that the symptoms of vesical and renal calculi,

differ from each other in some essential points. By the expression, therefore, "then the painful symptoms returned," I suppose we are to understand, that a *new* train of symptoms *commenced*, "and, constantly increasing in violence," &c.

In this connection it will be proper to state, that the patient had been afflicted with *prolapsus uteri* for many years prior to the development of the symptoms of urinary calculi; and that before the information contained in the above history was obtained, the comparatively anomalous freedom from the *ordinary symptoms* of vesical calculus up to the period of about a week after voiding fifteen calculi, was attempted to be explained in either of one of the two following ways: 1st. That the calculi might have lain in a quiescent state in a membranous sac, formed of the inner coat of the bladder; or, 2d, That the prolapsus of the uterus might have forced the fundus of the bladder *backwards* and *downwards*, so that that portion of the viscus ordinarily the most *elevated*, actually, when still farther depressed by the accumulation of the calculi, occupied the most *dependent situation*; and that by a temporary reduction of the prolapsed uterus, or in some other way, the backward and downward reflection of the fundus of the bladder had been carried upward and forward in a position to empty itself forwards and downwards on the neck of the bladder, and thus to occupy a favorable position to discharge the calculi.

We will allow that this is merely speculative, but had we not obtained pretty conclusive evidence that the calculi voided spontaneously were originally *renal*, might not the theory or the idea be a plausible one? Nevertheless, it is reasonable to suppose, that the prolapsus of the uterus contributed to augment the symptoms, and increase the sufferings of the patient in every attempt to void the contents of the bladder.

From this brief history of the case, we learn that from the 15th of April, 1857, the time of voiding fifteen calculi, up to the time of the operation, on the 29th of September last, a period of about five and a half months, she was more or less severely troubled, (one week excepted,) with symptoms of stone in the bladder.

On the day of the last date mentioned, I visited the patient in company with my colleague, Prof. Thos. Hun, with the intention of operating on her by lithotripsy. In making an examination with a metallic instrument, a calculus was readily detected in the bladder, and of such size as led me to think that it might be extracted through the urethra by small sized dressing forceps.

It was readily embraced in the jaws of the instrument; and in making an effort to extract it through the urethra, already considerably enlarged, a portion of the side of the calculus, as may be seen by examination of the specimen, gave way, and thus the grasp of the instrument was detached. I was aware that the calculus was much longer in one direction than in the other. After making several ineffectual efforts to grasp it in the long diameter of its axis, I introduced the forefinger of my right hand into the vagina, by which I was enabled to press upon the bladder behind the location of the calculus; and by introducing the broad or scooped extremity of a common pocket case director, I succeeded, between the finger and instrument, in bringing the calculus into the urethra endwise. The pressure upon the posterior extremity of the calculus, by the finger and instrument, contributed to shorten the urethra, so that the distance from the orificium to the anterior extremity of the stone was scarcely half an inch. By these means it was so fixed that I could retain it in that position by the finger alone.

On the spur of the moment I determined what course next to pursue. Still maintaining the forefinger of my right hand, as before described, I requested Professor Hun to place in my hand a straight probe-pointed bistoury, which I introduced flatwise on the upper and outer face of the calculus about an inch and a half; then turned the edge up, and cut upwards and outwards towards the groin. The anterior extremity of the urethra was divided from a third to half an inch, which was amply sufficient to enable me to bring the calculus forward, and to extract it by the aid of the finger and grooved staff.

Although the operation was not very tedious or long protracted, yet the patient appeared to be quite fatigued at its con-

clusion. On the whole, she sustained it with heroic fortitude, and recovered rapidly, as will appear from the following extract of a letter I received from her friend, bearing date Nov. 4, 1857: "Mrs. J—— has recovered her health entirely—is perfectly comfortable and cheerful; goes from cellar to garret, and takes her meals with the family. The change seems miraculous."

It will be proper to state, that I found the patient confined to her bed, much emaciated, and in a constant state of suffering. The same friend writes me under date of December 9th, 1857: "At present her health is better than it has been for many years. She sleeps, eats, and digests as well as I do, though she is eighty-seven years of age."

The fifteen calculi voided on the 15th of April, varied in size from a small pea to that of the end of the little finger. They were white or ash-colored externally; and "pale fawn color" internally. Their form or shape was irregular, being mostly convex on one side, and plain or moderately concave on the other, showing that the concavity of one corresponded with the convexity of another.

The one extracted by the operation measured one and three-eighths of an inch long, and five-eighths of an inch in the transverse diameter. On sawing it through lengthwise, the center was found to be composed of a nucleus of the identical character, physically and chemically, of those that were voided on the 15th of April, as the following chemical analysis will show.

I wrote to a friend of the patient requesting him to procure for me a chemical analysis of the outer or cortical portion of the calculus extracted by operation; and also, of one or more of those voided spontaneously. This request has been ably and very satisfactorily answered by Dr. C. F. Chandler, professor of analytic chemistry of Union College, Schenectady, as will be seen in the following letter, which contains the results of his examination:

"DEAR SIR—I have examined the calculi which you gave me, and obtained the following result:

“ The small calculi, about one third of an inch in diameter, consisted of two portions, which I examined separately; an outer layer, about as thick as a wafer, and an interior portion which formed the bulk of the calculus. Both were of a pale fawn color, and proved to be very similar in composition.

“ The small piece sent, I believe by Dr. March, had an entirely different appearance. It was part of the outer layer of a large calculus, quite white, and about one-eighth of an inch thick. Its composition was quite different from that of the small calculi.

“ I have formed a table in which I have given the chemical composition in figures, which are, I think, pretty nearly correct. A few of the percentages were determined by direct quantitative analysis; but the others were estimated from the behavior with re-agents.

	“ Calculus sent by Dr. March.”	Interior portion of small calculus.	Exterior layer of small calculus.
Urate of ammonia.....	11	85	80
Urate of lime. ....	4	4	8
Tripple phosphate of magnesia,..	55	2	6
Phosphate of lime,.....	20	1	2
Water, .....	10	8	4
	—	—	—
Total,.....	100	100	100
	==	==	==
Ashes or inorganic portion,.....	57½	2½	6½

“ The first is a triple phosphate calculus, containing considerable phosphate of lime; but not quite enough to make it a ‘ fusible calculus.’ The small calculi are, however, water of ammonia, and contain very little inorganic matter.

Yours, very respectfully,

C. F. CHANDLER”

In reference to the above analysis the friend of the patient, in a letter accompanying it, writes thus: “ The great difference in chemical composition between the calculi, which were discharged spontaneously and that which you extracted, is very striking to the uninitiated, at least. “ Is it peculiar, or is it common? Did the interior of the calculus you removed resemble

in appearance those first voided? Would it not have been satisfactory to have had an analysis of it?"

Although I was fully satisfied as to the identity of the chemical, as well as of the physical characters of the small calculi and the *central portion* of the large calculus extracted by operation; yet, to obtain demonstrative proof, I sent to Prof. Chandler a longitudinal section of the latter, together with one of the former, for chemical analysis, and in reply have received the following note:

SCHENECTADY, *Nov. 22d 1857.*

DR. MARCH:

Dear Sir—I have examined the interior of the large calculus which you sent me by Henry Martin, and find it to be identical in composition with the small calculi which it so much resembles in appearance. It seems remarkable that calculi, differing so much in composition, should exist in the bladder at the same time; yet we know that salts almost always separate when they crystalize from a solution."

I think I can offer an explanation that will solve the difficulty in the mind of the friend of the patient, who is really a literary and scientific man, as well as reconcile to the mind of Prof. Chandler the apparent incompatibility of the existence of a calculus in the bladder, whose *external* and *internal* parts differ so widely in chemical composition.

If we refer to the history of the case, I think we shall have every reason to believe that there were originally *sixteen* instead of fifteen urinary calculi (the number voided on the 15th of April); that they were formed in the infundibula, or perhaps in the pelvis of the kidney, where they were clustered together, as was manifest, "for six weeks, or longer, previous to the middle of April," by pain in the loins; by a sudden and severe attack of pain in the lower part of the back, on the 14th of April, and by voiding the next day fifteen urinary calculi.

Now I believe, that the sixteenth, or one of the renal calculi remained in the bladder, which formed a *nucleus*, around which

a new and different chemical deposit took place and accumulated for five months or more, (while it remained there,) to the dimensions heretofore stated.

The early symptoms of renal calculi ; the intense pain and suffering during their passage from the kidney to the bladder, and voiding a large number the next day ; after which the comfortable condition of the patient for a week or more ; and finally development of the painful cystic symptoms of urinary calculus and their increase in violence up to the time of the operation, seems to sustain the explanation I have suggested.

It belongs to the province of the chemist to decide in what respect, if any, the urine differs immediately after its secretion, and while it yet remains in the renal apparatus, from its condition after it has reached and remained for some time in the bladder.

I have now operated for lithotomy twenty times;\* and on three patients for lithotripsy. This, however, is only my second case of lithotomy on the female ; and I will venture to say, that the subject of it is one of the oldest ever operated on with success so complete, and in every respect so perfectly satisfactory. It has neither left a fistulous opening in the neck of the bladder, as one mode of operating on the female is liable to, nor, incontinence of urine, as has often been the result of dilating the urethra, or of opening it in a downward direction.

The youngest patient was two years and ten months old, and the oldest male, seventy-two years of age. And I hardly dare to state, what is almost literally true, that they have been almost uniformly successful.

My first operation for lithotripsy was performed but a few weeks before I made a visit to Europe, in 1841 ; and although a large quantity of the fragments of the crushed calculus passed off, yet the bladder was not entirely freed from the foreign substance. The patient went to New-York, in my absence, and there died in the course of four or five months, as I was informed. The other two cases were completely successful.

\* Since this paper was presented to the Society, I have operated successfully for lithotomy, on a boy six and a half years of age.

Of the twenty cases of lithotomy, one patient died in about two weeks after the operation, of what was supposed to be an attack of acute rheumatism. The patient was located more than one hundred miles from my residence, and was left in the care of the attending physicians, who made a post mortem examination, and reported that they found nothing connected with the operation by which they could account for his death. All the other patients recovered.

I am aware that the number of my cases and the extent of my experience is small, indeed, in comparison with that of some of the surgeons of Europe, and especially with that of the veteran operator of our own country, Professor Benjamin W. Dudley, of Lexington, Kentucky.

On my return from attending the meeting of the American Medical Association, held at Nashville last spring ; and after witnessing the operation of lithotomy by the much respected and accomplished surgeon, Professor Paul F. Eave ; and after having, in company with many of the most distinguished physicians and surgeons of the United States, enjoyed his hospitalities, I was very desirous of making the acquaintance of Professor Benjamin W. Dudley, of world-renowned reputation in the operation of lithotomy

I called on Dr. Dudley, a nephew of the great lithotomist, and I believe, Professor of Surgery in the Transylvania University, by whom I was politely received, and immediately conveyed in his carriage to the residence of his uncle, located about one mile out of the heart of the city, where we found the gentlemanly patriarch of the profession upon the beautiful grounds around his spacious mansion, superintending the improvement of a carriage way. We met with a cordial and welcome reception—were invited into the house, and immediately entered into conversation upon the subject of lithotomy.

Some years since we had announced to the medical public that the doctor had operated one hundred and eighty times or more, for stone in the bladder. I felt an interest in receiving a statement of the number of his operations from his own lips. In

this desire I was gratified. He informed me that he had operated for lithotomy two hundred and seven times, and with a success unparalleled in the annals of capital surgical operations, having lost but five or six patients out of this large number. Indeed he informed me, that some of this small number of unfavorable results could hardly be attributed to the immediate effects of the operation.

Dr. Benj. W. Dudley, may be seventy-two or seventy-four years of age; and although rather slender in figure, he was erect, and appeared active in body, and in the full possession of his mental faculties. His hair is somewhat silvered o'er, long, straight and thin; he has a mild and pleasant countenance, a bland and winning voice, and a very easy flow of choice language. In short, he reminded me of the great statesman, and his late fellow citizen, Henry Clay.

He has entirely retired from the practice of his profession, and seems resolved to spend the evening of his days in the quiet, healthful, and agreeable pursuit of agriculture and horticulture; leaving the *field of surgery*, he has so successfully and profitably improved, in the hands of able successors, to cultivate.

I hope to be pardoned for making this partial digression from our subject, and will close, by referring to some statistics of mortality of the operation of lithotomy.

We gather from an American edition, of 1826, of Wm. Prout's work on urinary calculi, the following statistics of mortality from the operation of lithotomy, performed in the hospitals or infirmaries of Bristol, Leeds, and Norwich, England:

The mean ratio of mortality in Bristol infirmary, was one in four and one-fourth; in Leeds, one in seven and three-fifths; and in Norwich, one in eleven and three-eighths. Mean ratio in all three of the hospitals, one in seven and three-fourths.

Prof. Paul F. Eave, chairman of the standing committee on surgery, in his report of 1851, and published in the fourth volume of the Transactions of the American Medical Association, has collected three hundred and fifty-four cases of lithotomy

from England and Ireland, out of which seventy-nine died ; and from our own country, four hundred and seventy-seven cases, of which only thirty died. In the former, the per centage of deaths is twenty-two and one-third, and in the latter, or in America, it is but about six and one-fourth.

How it happens that the operation for lithotomy, is so much more successful in this country than in Great Britain, we are altogether unable to determine.

Are the constitutions of our citizens more tough and elastic than the subjects of England and Ireland? or is the greater amount of our success to be attributed to the exercise of more skill in operating, and more care in the subsequent treatment?



