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Dudley (B. W.)
OBSERVATIONS

ON THE

NATURE AND TREATMENT

OF

CALCULOUS DISEASES.

✓
BY BENJAMIN W. DUDLEY, M.D.

26807
Lexington, Ky.

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Observations on the nature and treatment of Calculous Diseases. By BENJAMIN W. DUDLEY, M. D.

In the whole range of surgery there is probably no subject in which is to be found a greater variety of unprofitable suggestions, than that involving the cause productive of calculous diseases. Until we shall have been rendered familiar with the laws of nature, and can comprehend the alliance subsisting between the healthy and morbid actions of the different organs of the body, there can be but little accomplished in regard either to the rational prevention, or the cure of disease. That the skin, the lungs, the bowels, and the urinary organs constitute so many avenues through which nature expels, by a secretory process, materials no longer suited to the sustenance and well-being of the system, is a position the truth of which cannot be doubted. The variety in the conformation of the organs engaged in the process, need not be urged against a fact well ascertained. The causes of calculus, whatever they may be, and however diversified in character, must produce their primary effects upon the general system; while the location of the disease upon the urinary organs, is an incidental and secondary action. In warm climates, it is a malady of very rare occurrence; the morbid association being greater between the bowels, the skin, and the organs receiving the primary impress of disease. In very high latitudes, and cold countries, the disease is equally rare; of which, evidence is drawn from the fact, that as many cases have been operated upon for stone *here*, in one season, as appear to have occurred in all New England, in a period of twenty years. It is in temperate regions, and especially where the waters are of an impure quality, holding in solution carbonate of lime, and other mineral substances unfriendly to the healthy and vigorous action of the stomach, that it is familiarly known in all classes of society, and is acknowledged to be one of great and distressing frequency.

That incidental cases of the malady may ensue upon exudations of blood, which become nuclei for calculous concretions, upon the secretion of coagulable lymph, or the too great and habitual retention of the contents of the bladder, can scarcely admit of a doubt. This, however, does not constitute the first step towards the explanation of the lithic diathesis in the system, and the formation of calculi in the bladder. A drop of blood, or a detached globule of lymph, a bullet, a portion of a catheter, or any other solid substance introduced and retained in presence of, or surrounded by the urinary secretion, may supply a nucleus, around which the calculous accretions will be formed. Such cases afford neither the facts, nor can the inferences be drawn, with a view to the explanation of a great majority of the cases, that occur in practice. The disease is common in Great Britain; and in their desire to account for its frequency, the great consumption of *malt liquors* is seized upon as a fact in explaining the calculous affections of the urinary organs; but in France, where the whole population is in the habitual use of vinous liquors, the disease is probably more common, and with reasons equally plausible, it is in that country ascribed to the consumption of *wines* of an inferior quality; while, in the absence of both these causes, in the United States, it has been, with not less confidence, referred to the effects of *lime-stone waters* on the system.

A distinguished graduate of this institution has made a variety of observations upon the effects of cantharides as a cause of calculus among children. Having witnessed several cases of calculus among those who had been afflicted with bowel complaints wherein blisters were resorted to in the cure, he was hence inclined to draw the inference, that cantharides in their effects upon the urinary organs predisposed to calculus. But if those who have been the subjects of tedious attacks of abdominal disease are especially inclined to calculous accretions, whatever the treatment, or the neglect of the case, then the suggestion in regard to the effects of cantharides is entitled to but little consideration; or at least, to no more than any other possible cause in supplying a nucleus for the disease.

The popular opinions and prejudices of every country upon unsettled questions in the profession, are worthy of regard, as furnishing materials connected with the customs and habits of society, out of which correct inferences may be drawn, truth unveiled, and practical science advanced. The cause of calculous diseases, however obscure in its seat and primary mode of action, must be sought for in the general system; while the affection of the urinary organs consists in a location of the morbid actions of the body upon those parts. Hence calculus is conceived to be a secondary disease, except where manifest local causes have been sufficient to account for its production; and, according as the habits and modes of living of different countries conduce to derangement of the organs engaged in receiving and appropriating the food, notwithstanding the variety of remote causes, the effect may be the same—the production of calculi. Crude materials, from a defective action of the digestive organs, thrown into the circulation for the purposes of nutriment and growth, must engage, to a greater extent than is safe or proper, those organs which are relied upon by nature to separate and throw off the noxious and useless part of the circulating fluids. Whether, therefore, the stomach and bowels be deranged by the use of sour wines, unwholesome malt-liquors, impure waters, or improper articles of food, the result is a transmission of nutriment to the system not properly elaborated, the injurious portions of which must be separated by the skin, the kidneys, or the bowels, as the emunctories of nature. The activity of the urinary organs at, or about the subsidence and cure of fevers of a protracted character, in relieving the system of materials no longer suited to the healthy purposes of the economy, is matter of notoriety to every observer, and it would seem to be a rational inference, that where nature has selected this outlet for substances no longer necessary, the liability to calculous accretions is in proportion to the unexcitable state of the organ, that for a time retains the secreted fluid. Where the bladder is lively in its sensibilities, and the calls of nature are attended to in season, the retention of the

urine in that organ is not ordinarily sufficient to admit of the formation of calculi; but in those more incorrigible cases, where the nuclei of the disease are formed and arrive at considerable magnitude in the pelvis of the kidney, and consequently, before they have reached the bladder, all remedies hitherto suggested are doubtful in their effects, and merit but a small share of confidence as lithontriptics.

But, that neither of the causes to which calculus has been referred, in different countries where the disease is of frequent occurrence, is directly concerned in its production, may be inferred from the fact, that it is a disease more especially incident, to *childhood* and to *old age*; while matured constitutions, and vigorous life, rarely become the subjects of attack.

Many children on whom the operation has been performed were great sufferers in cholera infantum previous to any symptoms of calculus in the bladder; and of the whole number that have been relieved by the operation, eight or nine were most probably born with the complaint upon them; as symptoms the least equivocal, and most distressing in character, appeared during the first two weeks after birth. At the time of writing this article, a young man is under a course of treatment for the operation, whose mother traces the disease back to his earliest infancy. But while conclusive evidence has been adduced, *in the number of cases*, to satisfy my mind of the occasional existence of the disease at birth, no observations have been made with a view to detect the cause of the malady in the particular state of the constitution, or health of the mother. The well known maternal influence, however, in the production and propagation of other diseases to the foetus in utero would justify the inference in regard to this.

Many of the cases that have been brought here for the operation had been repeatedly attacked by the aggravated forms of intermittent fever. Chronic derangement of the digestive organs previous to any manifest symptoms of the existence of calculus, as well as during its continued accretion, has been a distinguishing feature in the history of a majority of those cases where there was sufficient intelligence on the part of the pa-

tient to give a correct narrative of his case: but a large majority of the whole number of those operated upon were of a class not accustomed to much restraint in their manner of living, and whose promiscuous table embraces the most crude and indigestible articles of food.

No circumstance is better calculated to show the close connexion between this disease and the particular condition of the digestive organs, than that which is so frequently observed during the treatment preparatory to the operation of lithotomy. A subject of the malady who may have suffered intensely for months, or for years, has been known to be so completely relieved by those medicines selected for the purpose of regulating the digestive organs, and of preparing the system for the operation, as to retire satisfied with the benefit he had derived, under the delusive impression, that by occasional recurrence to the use of the same medicines, the operation might be avoided. Where the general system is maintained healthy under the influence of calculus, there are also cases in which the use of particular articles is calculated to obtund the sensibilities of the bladder, and thus preserve the patient in a tolerable state of repose. A British admiral, according to Sir A. COOPER, was so completely relieved of all the most distressing symptoms of calculus, by the use of calcined magnesia, that he continued to take this medicine to the extent of a tea spoonful three times a day, for many years, and was thereby enabled to attend to all the active and laborious duties of his profession. By the use of a remedy of the same class, *the carbonate of soda*, the water of crystallization being expelled by means of heat, I succeeded in one case, in bringing off large quantities of calculous material, bearing the appearance of having been partially re-dissolved in the bladder, and thus secured a like degree of repose to the patient. But such cases are so rare, and the remedy so delusive in its effects, that, like lights set up to decoy, they are calculated to injure by delay; or at least in a great majority of cases, to protract the sufferings of the patient, and to make the ultimate resort to the operation more doubtful in its result.

The variety of empirical prescriptions under the head of *lithontriptics*, which are used in calculous diseases, are proved to be void of these virtues, while they have, most generally, a deleterious influence upon the urinary organs. A large proportion of them are among the active diuretics, which, by increasing secretion, keep those organs excited, which are already too much disturbed. Others are of a nature that stimulate the bladder to frequent and violent morbid contractions, whereby the more distressing symptoms are aggravated to such a degree, as to have caused in some instances a rupture of a portion of its outer coats, the inner thus protruding so as to constitute hernia; the calculus being, in this manner isolated, and placed without the common cavity of the organ.

A highly intelligent gentleman, active in his habits, and vigorous in intellect, experimented upon himself for fifteen years, under circumstances of the utmost caution and prudence, using the entire class of remedies without benefit; and in his seventy-fifth year, when he submitted to the operation, did not hesitate to affirm his conviction, not only of the entire inefficacy of all internal remedies, but of the great and lasting injury resulting to the general system, and to the organs particularly involved, from their effects on both.

Calculous affections are more commonly met with among children who have been neglected, and who have suffered much with abdominal diseases; and yet under similar circumstances, there is a remarkable difference between the liability of the male and female to these disorders. Out of one hundred and thirty-five individuals who have submitted to the operation, *eight* only were *females*; of whom, two were married, one a maid of twenty years, and the remaining five, children. But the comparative freedom of the Africans, from the disease in question, is a fact more difficult to account for. With all his disregard to prudence, and his unrestrained indulgence in every species of food; and notwithstanding his liability to diseases of the digestive organs, still he is preserved comparatively free from calculous affections. Of all the calculous cases that have been under treatment, *five* Africans only have

been operated upon, all of whom were children, and not one of the number a female.

The return of the malady is so rare, as to constitute no obstacle to the operation among the afflicted; and yet I have seen BOYER perform it for the third time on the same patient: and, in my own practice, a second operation was resorted to in the case of the African who was last under treatment, and only about twelve months subsequently, when a calculus equal in magnitude to the first, was extracted. A perfect immunity from an attack seems more generally to be the result of the operation.

The conditions under which the operation may be performed with the best prospects of success, merit the special consideration of the surgeon. He is cautioned against its consequences by authors, in those cases, that are attended by ulcerations of the bladder, by hæmorrhage, and by enlargement and inflammation of the prostate gland. But of all states of the organs, that wherein there is great reduction in size, with a ribbed and indurated interior, as indicated by the movement of the sound in exploring its cavity, is the least propitious to recovery. Such a disease of the bladder is independent of, although an occasional attendant upon calculus, and in all instances of its occurrence, it is found to be the most destructive in its tendency. The calculous accumulations, in these cases, amount to little more than a collection of sand, which the organ is incapable of expelling; while the suffering of the patient is of the most excruciating kind. In the progress of preparation for the operation, it often happens that all the more immediately distressing symptoms are to a remarkable degree allayed, and that the active form of the organs diseased is not less agreeably changed in character. Hæmorrhage no longer recurs; discharges of pus and mucus subside; thick, muddy, and ropy urine is converted into a pale, limpid fluid, and from being excessively offensive, becomes comparatively inodorous; the small, frequent and painful, evacuations are also replaced by full, free and copious dis-

charges from the bladder. All these symptoms, which have presented so many difficulties to the surgeon, have been often known to subside under the preparative course of treatment.

Among the remedies belonging to the preparatory treatment, and with reference especially to the condition of the bladder just referred to, the *warm bath* occupies a conspicuous place. Its influence in checking spasmodic affections of the bladder, proceeding from stone, and other causes, is familiar to every surgeon. Its tendency to calm deranged action in the blood-vessels by establishing secretion, and by promoting healthy action in the skin, is not less familiarly known; and the lively, and indissoluble connexion subsisting between the skin and the digestive organs, secures the beneficial effects of the bath to the latter, in all those instances wherein it produces an agreeable effect upon the surface. By means of the warm bath, added to the free and judicious use of emetics, repeated as they may be indicated by the deranged state of the stomach, or the febrile condition of the system, together with mercurial cathartics, as called for by the state of the liver and bowels, much may be done towards preparing the calculous patient for a successful issue, when the operation is performed. But the diet and drinks are not less important items, than medical prescriptions, with a view to place the patient in a state of safety. Such articles of food and drink as impose the smallest amount of labour upon the digestive organs, and communicate the least excitement to the general system, should always be selected; and in addition, the patient must be restricted in regard to the quantity, as well as the quality of his food. Excess may be committed in the quantity of food consumed, however mild and unirritating it may be in quality, and in all cases of a deranged, or excited state of the system, and especially when to this is to be added the shock of a capital operation, such an indiscretion should be guarded against. Some cases of calculus have been under my charge, where the general system gave such evidences of a favorable state, that the operation was performed without delay, except so far as to administer a single dose of medicine to evacuate the bowels; while on other occa-

sions, the patient has required medical attention for two or three months, to place him in a condition to justify the operation. In every instance, however, it is an object of primary importance, that all morbid action in the general system, or in any of the individual organs, exclusive of what is the immediate consequence of the presence of the stone in the bladder, should be removed before the operation is performed. A defect in the circle of animal actions, so obscure in its influence on remote organs, as to have escaped observation, is often called into active existence, by the shock of a severe operation. For several seasons succeeding to the fatal epidemic of the winter of 1813-'14 no operation of magnitude was performed, and no severe injury in person was sustained, when the patient under my charge escaped an attack of bilious fever. This was generally developed previous to the third day; very often on the evening of the day of the operation; and notwithstanding all the caution used, in the discreet exhibition of medicine, severe fever almost uniformly ensued. But, while the liability to this fever has gradually subsided, observation has constantly impressed upon me the paramount importance of putting the general system of all patients requiring operations into a healthy state, in order to ensure a happy issue. I am the more explicit here because I know that many surgeons pay but little attention to the medical treatment of their patients, either before or after an operation; while they esteem their labour as nearly at an end when the dressings have been properly adjusted to the wound. This is indeed a very partial view of professional responsibility, and leads to consequences not less fatal to society, than humiliating to the practitioner. The preparation necessary for, and the treatment consequent to, all critical operations, is even more important than the greatest skill in the use of instruments. Why the European surgeon bestows so little attention upon his patients' general health, has ever been matter of surprise to me; for although he may receive his patient from the hands of the physician, the practice of the two being maintained separate and distinct; still, it is manifest, that improvements

cannot be made, or the practice of surgery successfully pursued, except by constant reference to those laws of life, and the principles of physiology, which constitute equally the basis of practical medicine, and of surgical skill. It avails nothing to the unfortunate sufferer, whatever may be the skill displayed by his surgeon in the use of instruments upon his person, when his system sinks, and the powers of nature fail, or when inflammation and death supervene upon the use of the knife. It is equally the duty of the surgeon to know, before his operation is performed, when his patient's system is defective in restorative power, as also, when causes of disease lie dormant, which being aroused and put into an active state, are calculated to endanger or destroy life. Unless he understands *when*, as well as *how* to execute, and is also prepared to control the morbid actions of the system consequent upon his interference, it were better to trust *all* to nature.

Among those who have adopted the principles of surgery inculcated by JOHN HUNTER, it is esteemed indispensably necessary to reduce the general system, however perfect the health of the patient may be, with a view to prepare him for an operation. Some are in the habit of free and frequent bleeding in order to suppress or extinguish any inflammatory disposition that might be made manifest, by any great shock of the system; whilst others, not very credulous in regard to the efficacy of any previous treatment, trust all to nature, except that they may evacuate the alimentary canal. The idea that high health is a state unpropitious to recovery, among those who have sustained violence from injuries, or operations, originated in false views on the part of Mr. HUNTER, and tends to great mischief in practice. Such an error could only have been embraced and propagated under the circumstances in which he derived all his experience. In camps, jail-ships, large hospitals, and very populous cities, the atmosphere is never pure; and hence the liability of the strong and vigorous to morbid action consequent to great injuries and extensive operations; a liability much less alarming to the inhabitant of villages and country situations.

The strong and athletic, placed under the favorable circumstances of others, who may have been freely and healthily evacuated in the treatment of their maladies, whereby the digestive circle of organs are maintained in their functions, would have given to Mr. Hunter a very different result as a consequence of injuries and capital operations. Fulness of health and strength of constitution are, in fact, the surest guarantees of speedy restoration from great injuries and capital operations; while danger may be apprehended in proportion to defect in one or both of these particulars. When the strength of constitution is sufficient for all the purposes of restoration, and the various important organs are in the exercise of their accustomed offices, success must ensue to an operation, whatever may be its nature or extent, provided parts essential to life be not actually destroyed. The efficacy of blood-letting, as a preparatory remedy in subduing the susceptibility to inflammation after operations, is relied upon by some of the most distinguished practitioners of Great Britain. My own experience is by no means in favor of this remedy; nor am I inclined to the opinion, that it can be sustained in general practice. The abstraction of a portion of the circulating fluids is necessarily followed by a loss of balance between the vascular and other systems, and the consequence of this loss of equilibrium, is torpor in some one of the more susceptible organs; a condition of things favorable to the development of inflammatory action, when the causes calculated to excite it are at hand. Inflammation succeeding to the frequent use of the lancet is the more difficult to control, by reason of the extent of the morbid associations which have been established, by the repeated abstraction of blood, which must subside before healthy action can be restored.

A distinguished oculist of Great Britain ascribed his success principally to the repeated use of the lancet before his patients were operated upon. I have never bled any patient, to prepare him for an operation; and the only case of cataract in which I have failed, because of the supervention of inflammation, in a practice of five-and-twenty years, happened in a lady

whose exceeding delicacy of health caused me to mistake the signs of inflammation for those of hysteria, and in which the most ardent advocates of the lancet would not have urged its use before the operation. I have not found it necessary to use this remedy with a view to control vascular excitement after any operation, except those performed on the eye; and then, when necessary, it has been used with admirable effects. The principles laid down by MARSHALL HALL in reference to the loss of blood, with a view to control vascular excitement, I have followed for twenty years, and embrace them as of inappreciable value. In the case of a man of middle age, on whom the operation of lithotomy was performed, whose life was in most imminent peril from hæmorrhage, the introduction of compresses into the neck of the bladder, along side of a catheter, arrested the bleeding, and when the compresses were taken away about the fourth day, suppuration had been established throughout the wound. By the tenth day, the wound was healed. But the weather being oppressive, the patient, contrary to the advice of his nurse, threw off his flannel, and contracted pleurisy, of which he died a week after, spitting blood and matter. It is believed that the excessive loss of blood sustained after the operation, by inducing torpor in the liver, spleen, and other abdominal organs, added much to the susceptibility of the system to the inflammation which destroyed this patient. A torpid state of the digestive organs, œdema of the lower limbs, a prostrate state of the muscles, general anasarca, a bilious aspect, and a morbid state of the general surface, are all known to ensue upon the loss of large quantities of blood; and should an individual thus situated sustain the shock of a severe operation, the danger of inflammation will be much greater, according to correct principles, and as known from observation. The inflammatory action, under such circumstances, may not run so high as when it is developed in a constitution of unimpaired vigor; but yet it is more difficult to control, while there is increased danger from a defect in the self-sustaining power of the system.

The distressing and dangerous nature of calculous diseases

has always elicited a large amount of professional talents, with a view to adopt the most appropriate medical treatment; to select the best among the variously modified instruments; and to execute the operation least hazardous, and most decisive in its nature. The *lateral* method of opening the bladder has received the sanction of so large a majority of the distinguished surgeons of every country, during the past and present century, as almost to put at rest all opposition. Still, however, this mode of penetrating the bladder, has been attended by such a frightful mortality in the large cities of Europe, where nearly all the afflicted with this disease congregate for relief, that attention has been kept alive to other modes, by which more success might possibly be secured.

The *high* operation has at all times since its introduction to public notice, maintained a certain share of professional approbation; and that it is peculiarly adapted to certain cases, while it may be performed with facility and success, we are not permitted to entertain a doubt. M. SUBERBIELLE, of Paris, the present advocate of this operation, had performed it, in the year, 1831, *fifty-six times*; and was successful in *forty-five* of this number; a very high degree of success for European city practice.

The mortifying and distressing effects of the lateral operation, as they are too frequently experienced among *females*, consisting in a loss of retentive power in the neck of the bladder, constitute alone an ample reason for preferring the high operation always in their case, where the calculus is very large and firm. In ordinary cases, its extraction may be effected without the aid of cutting instruments; and when, after the urethra is thoroughly dilated, the stone proves too large to be removed, and is, withal, too firm to admit of being broken up by instruments, the *high* operation should have the preference. In all the cases that have come under my charge, the female has been relieved without cutting instruments; and it is believed that in a very large majority a cure may be effected in the same way. But I have seen a case in the hands of a Parisian surgeon, M. BOYER, in which the calculus filled the bladder, and the

uterus was suspended at the os externum, in which the high operation was successfully performed, and the latter organ replaced in its natural position, after having been literally exposed, and suspended without, for many years. When the calculus is of large dimensions, and is, notwithstanding, removed by dilating the urethra, it may occur, that the part from over-distension or laceration may be left in the condition more especially to be apprehended after the lateral operation. A little girl, of eight years, who was under my charge, furnishes a case in point, in which incontinence of urine resulted from the dilatation, and continued for three years; but before puberty, she regained perfect command over the organ. On the contrary, females have applied to me for relief from the distressing effects of the lateral operation ten years after it was performed, and it is proper here to add, that I could not afford relief.

I have heard Mr. Abernethy suggest the propriety of maintaining a certain position after the lateral operation, in order to secure a healthy reunion of the divided surfaces; and it is possible were such patients required to rest on the stomach for four or five days, the object might be secured: but since the high operation does not endanger the healthy functions of the bladder, and involves parts not more essential to life than the other, there would seem to exist a strong reason for giving it the preference in all the cases among females, wherein the dilatation of the urethra does not afford the proper facilities of extracting the calculus without the necessity of cutting.

The method of CIVIALE has attracted much attention within the last ten years; and according to its advocates, it is an operation attended by equal success, excites less pain, and involves a smaller amount of danger, than any other. To the timid it offers the admirable recommendation of proposing a cure without the use of cutting instruments; as it is reported to be performed, while the patient sits in his chair, and is entertained in pleasant conversation. The instruments that are used in this operation are all fashioned with a view to accomplish one particular end; however varied in size and form,

the object in the use of all, is the reduction of the calculus in the bladder to small fragments. Whether, therefore, it is bored down with the perforator, crushed to pieces by the forceps, or reduced to sand by percussion, the principle upon which the merit of the operation is to be sustained before the community, is the same.

The calculus must be reduced to the condition of sand, or of fragments sufficiently small to be evacuated with the urine, and must be brought away, before the cure is made complete. The difference in the manner of reducing the calculus, is not in any respect a departure from the principle involved in the operation, as proposed by the original author of the plan. An inventor of an individual glass in optics is as much entitled to the reputation gained by Newton from his splendid discoveries in that science, as Huertetoup is worthy of the reputation gained by Civiale for destroying the stone in the bladder, on the bare ground of suggesting percussion as one mode of reducing the calculus.

It is the principle of grinding it down in the bladder, that sheds reputation on the inventor; not the variety in the mode by which this is put into practice. But while Civiale is entitled to all the credit of this mode of curing the most distressing malady to which humanity is liable, it remains to be decided, how far it is an operation that may be introduced into general practice; or whether by reason of its peculiar character, it is found only applicable to certain favorable, and not altogether common cases of the disease. Should the latter be the decision of surgeons upon it, then, like many other plausible innovations, its career will be short, while it will soon roll into the common vortex that awaits all suggestions more speculative than practical in science. That a straight instrument, and one of much larger dimensions than the common catheter may be passed without any particular difficulty into the bladder, is a fact well known; and it was from a knowledge of the possible advantages to be derived to surgery from it, that Civiale must have conceived originally the practicability of his operation. The medical public is yet to be informed in regard

to the particular effects of large straight instruments upon the parts involved in this mode of removing calculi. The experience of Messieurs Civiale and Heurtetoup enables them to communicate some interesting information upon the pathology of the testes, vas deferens, prostate gland, and bladder, as they may have observed it consequent to the use of their instrument; and they may have discovered why the left testicle is most subject to sarcocele under such circumstances. When the calculus is soft and small; the bladder, prostate gland, and urethra healthy, and the system unexcitable, the operation of Civiale may be performed with some safety and success by those accustomed to the use of his instruments. But when the calculus is either remarkable for its magnitude or hardness, when the bladder is ulcerated, inflamed, or highly excitable, when the prostate gland is diseased, or the urethra contracted and inflamed, the instruments of Civiale are inadmissible with the safety of the patient.

In very populous cities where the disease is common, the surgeon might have an opportunity of selecting those cases in which the method of breaking down the calculus in the bladder could be safely and successfully performed; but when in addition to the inconsiderable number of favorable cases that occur, it is acknowledged to be an operation requiring great mechanical skill in the use of instruments, together with a delicate tact in seizing and commanding the calculus, it must appear obvious, that it is a practice which cannot command public approbation.

The condemnatory opinions of Larrey and other distinguished surgeons of Paris, which are the result of observations made upon patients operated upon after this manner, for calculus afflictions, are before the public. With a knowledge of them, it is presumed the young aspirant in the profession would adopt a less objectionable and more simple method of cure.

The lateral operation being preferred to all other methods of treating calculus in the bladder by surgeons generally, it is desirable that equal concurrence should be had in the manner of its execution; and that the form and character of the instruments

for the different parts of the operation should be similar, in order to secure equal success among all competent operators. Even the position of the staff at the moment of making the external incision is worthy of particular regard. Monsieur Dubois recently of L'Ecole de Medicine, one of the most distinguished operators of any age or country, used the same knife for the external incision, and also for making the opening into the bladder; an instrument differing from the ordinary scalpel only in being somewhat larger and longer. Most modern surgeons use the knife to make the incision into the bladder, which is variously formed to meet their particular views of appropriateness; while many have condemned the gorget as an instrument better suited to the timid operator, and to those who are deficient in anatomical knowledge. The bistouri caché is a favorite instrument with some for the purpose of opening the bladder.

Sir A. Cooper, on one occasion, proposed to perform the operation of lithotomy in the presence of a large class, with the bistouri caché, but after springing the blade in the bladder, he commenced its withdrawal with the cutting edge turned to the symphysis pubis. As soon, however, as he discovered what was done, he cautiously withdrew it from the wound, cast it from him, and advised the class never to use an instrument of that description.

Sir A. Cooper's knife, a long slender scalpel with a beak at its extremity, fitted to the grooves of the staff, is an instrument known to most surgeons in this country; while some prefer it to all others for making the incision in the bladder. After making satisfactory observations upon the various methods of opening the bladder, I have become satisfied with the superiority of the gorget of Mr. Cline, an instrument preferred to any other, and therefore recommended by Mr. Abernethy in his lectures. Besides the accident which happened Sir A. Cooper with the bistouri caché, the most elegant operator, and the first surgeon of his age, the danger in springing the knife in the bladder, of wounding parts not *necessarily* involved in the operation and fatal to the patient, constitutes a sufficient rea-

son for its rejection. The liability to quick and sudden contraction of the bladder upon entering it with the bistouri, endangers its being wounded in its fundus, or side, before the movement is made with a view to the division of the neck; and this objection may be urged in part, against all the knives that are commended by different surgeons, as well as the *bistouri cachè*.

When a surgeon has a piece of anatomy fairly exposed to view, upon which a certain operation is to be performed, the superiority of the scalpel cannot be rationally contested. But when the neck of the bladder and the prostate gland, the parts upon which the deeper incision in lithotomy is made, are beyond the sight, nor even accessible to touch, another sense important to the successful execution of the duty of the operator, the case becomes materially changed: and if the bare remoteness from the surface, of the prostate gland and neck of the bladder, those portions of the deeper seated anatomy involved in the operation, presented the only difficulty to the lithotomist, then by exactness in the movement of the hand, the gland and the neck of the bladder might be opened with some safety and success; but in every subject of the disease that comes upon the table, there is more or less variety in the anatomy of the parts concerned in the operation.

In youth as well as in advanced age, in the deep as well as the shallow perinæum, in the feeble as well as the athletic habit, the prostate gland may be preternaturally hard or soft, large or small, firm and resisting, or it may yield before the cutting edge of the knife; a diversity well calculated to give uncertainty to the movement of the cutting portion of the knife which extends beyond the sight of the operator two, three, or four inches, according to the depth of the parts. Thus it is that the lateral surface of the bladder may be opened more extensively than the operator would desire; or the lateral blood vessels and nerves of the vicinity be divided, which should be guarded against with the utmost caution. The argument for opening the bladder with the knife, that the incision may correspond to the magnitude of the calculus, is of little

weight among those whose experience has been extensive in the use of the gorget, and who take steps to protect the general system from the consequences of the shock of the operation. The advantages of a *clean cut, with a fine-edged scalpel*, are in no respect equal to the estimate made by the advocates of the practice; nor is the bruising even to laceration of the soft parts, by the use of instruments in the extraction of calculi, so much to be feared in its consequences, as those are inclined to imagine, who have formed their opinions from injuries done to other parts of the system. The uninterrupted warm bath in which the wounded parts are kept, by the presence and passage of urine, maintains them safe under all circumstances, where the general system has been attended to, and where the violence done is not such as to destroy all power of reaction.

The immediate causes of death after the operation, are said to be, either hæmorrhage, mortification, or sudden sinking, as a consequence of the shock. It can scarcely in any case be made to appear, that hæmorrhage from those vessels which are *necessarily divided* in the operation, can become a cause of death. When the patient is extremely reduced, and thereby cause is given for such an apprehension, it becomes the duty of the surgeon to postpone the operation until the health and strength are improved; but this great reduction of vigor need scarcely be anticipated in practice. Out of one hundred and forty-five individuals afflicted with the malady who have made application to me for relief, the operation was performed upon all with the exception of ten; and of this small minority, two only were presumed to be too debilitated to justify the operation: one of these was a gentleman eighty-two years old, the subject of frequent and prostrating hæmorrhages from the bladder; the other a youth in the last stage of hectic fever from disease of the liver and lungs.

In the other eight cases the operation was rejected from different and various reasons. In the first case of calculus wherein I was employed as a surgeon, the transverse perinæal artery, a vessel necessarily divided in the operation, proved to

be of such magnitude, that the bystanders conceived it to be the internal pudic, and it became necessary to secure it with a ligature. On several subsequent occasions hæmorrhage from different vessels followed the operation, to an extent that excited some uneasiness; yet the first was the only instance in which a ligature has been applied by me to stop bleeding after the operation of lithotomy.

The blood vessels about the lateral portion of the neck of the bladder, together with those of the prostate, and bulbous portion of the urethra, but especially the first and last, are more likely to prove troublesome if opened in the operation; and when hæmorrhage occurs from those deep seated vessels, it is not without difficulty that efficient measures can be adopted to control it. The constant variety in the depth of the perinæum, in successive patients who present themselves for the operation, added to the variable condition of the neck of the bladder and prostate gland, including the enlarged and the indurated, or the relaxed and diminished state of this organ, tends very much to expose these parts to be unnecessarily and dangerously wounded, when the scalpel is selected with a view to open the bladder. A sweep of the knife, the extremity of which is made to perform an arc of a circle in the bladder, with a force applied, sufficient to carry it through a space precisely suited to one patient, might with similar force be quite too extensive for a second, and of insufficient dimensions in a third; and this is his dilemma whether the surgeon is desirous either that his incision shall correspond to the magnitude of the calculus, or that it shall be of the same dimensions in every case.

To secure uniformity to an operation made with the scalpel on parts not accessible either to the sight or touch, the hand should in every case be at a like distance from the incision to be made; while the parts to be divided must be similar in the resistance they oppose to the edge of the instrument. These are conditions which it is impossible to secure in the operation of lithotomy. Wounded vessels are no doubt inclined to bleed, more or less, according to the healthy condition of the general

system, and of the particular parts, at the time the operation is performed; and from idiosyncrasy one individual is much more exposed to hæmorrhage than another under like circumstances. These facts make it important that the subject for every operation of lithotomy shall be treated by diet and medicine so as to curtail, as far as practicable, the causes of difficulty and danger after it is performed.

Inflammation is represented, and no doubt with great propriety, as one of the most dangerous consequences to this operation. It may be the more immediate result, either of the unprepared state of the general system; of the highly diseased condition of the parts operated upon; of the incautious latitude of the incision through the prostate, and neck of the bladder; of the dressings applied to the wound; or of the mode of confining the patient in bed after the operation is performed. The remarks already made on the importance of a healthy condition of the general system, and especially of the organs involved, as preparatory to all capital operations, renders it unnecessary to add more on that subject.

An uncalled for extent of incision through the prostate gland and neck of the bladder, besides incurring danger from hæmorrhage, leaves the parts in a condition more exposed to inflammation. According to the extent of the wound in the neck and side of the bladder, will be the liability to infiltration of urine into the cavity of the pelvis, an occurrence that would produce the most destructive form of inflammation. Many surgeons in this, as after all other operations, are accustomed to apply what they may esteem the most appropriate dressings to the wound, a practice, the tendency of which is thought to be scarcely equivocal. The surgeon must desire, so long as the wound in the bladder remains unclosed, that the fluid from its cavity shall have a free passage through the external wound. He could not embrace the practice of maintaining the edges of the wounded bladder separated, with a view to favor the escape of urine. This would be in opposition to the efforts of nature wherein she is often successful in re-uniting the bladder by the first intention: nor can he, as I conceive, consis-

tently with views equally sound, make an application of dressing to the surface, the tendency of which would be to retard or obstruct the discharge of fluids, through the external wound, which may have escaped from the bladder, since such a course of treatment would be favorable to the infiltration of urine. The obvious line of conduct for the surgeon with these reflections before him, is to avoid all dressings, and to maintain the wound in a condition most favorable to the free escape of all fluid not within the cavity of the bladder.

The position in bed for the first two or three days after the operation, is a point worthy of the surgeon's care. Some of the most distinguished operators, and among them Mr. John Bell, placed his patient on the right side, and required him to retain that position as most conducive to safety. It is obvious that the patient cannot be the subject of a constant flow of urine through the wound when lying on the right side, inasmuch as the left side of the bladder is opened; but it is yet to be decided, whether this position is not most favorable to the escape of urine into the cellular substance of the pelvis.

While the right side of the bladder is progressively filling in this position, the inference is admissible, that the left is drawn off from the corresponding surface of the pelvis; whereby the escape of urine into the cellular substance is facilitated. Impressed with the correctness of these views, I have always required the position on the left side, to be scrupulously observed, until from the free and unrestrained flow of urine through the wound, all danger from infiltration has passed away. The exact correspondence between the incision in the integuments, in the perinæum and bladder is peculiarly favorable to the discharge of the urine when the patient rests on the left side; and after the operation, it generally flows uninterruptedly until the organ begins to regain its powers: hence the advantages of this position over any other. Yet I would not be understood to urge that *position can at all times* preserve the patient free from infiltration. My own observations would reject such an inference, as the following interesting case must exemplify in a very conclusive manner. Steele, a youth of 17,

applied to be relieved of calculus in the bladder, with which he had been afflicted for four years. In the meantime he had also been the subject of abscesses of a peculiar character on various parts of his body and limbs, all of which included more or less of needle-like formations of bone. One of these was in a state of maturity at the time of his arrival to be put under treatment. He had also sustained a luxation of the left hip-joint three years previous, as represented by himself and his father, occasioned by cramp in the muscles of the hip; and the limb remained three inches shorter than the other.

Being much reduced, he only took one cathartic as preparatory to the operation. When placed on the table and tied in the presence of some of the faculty, and of all the medical class, I was greatly astonished to perceive the left tuberosity of the ischium apparently two inches longer than the right, and its transverse dimensions so much increased, as to occupy most of the space between this bone and the constrictor ani; whereby it became impossible to perform the operation in the usual way. Under these circumstances, and while the assistants were taking their positions, the idea was conceived of making the external incision transverse, and of dividing the common point of insertion for the constrictor and perinæi muscles; which was executed before it was ascertained by those present to be the *only alternative* in performing the operation.

After great labor and difficulty, a calculus measuring about eleven inches in circumference, and upwards of three inches in diameter, weighing nine ounces, was extracted. The violence done to the soft parts by the forceps, the lever, and the calculus, caused the whole of the accelerator muscles, and the bulbous portion of the urethra, to slough and come away; and the bladder which was filled by the calculus, except between the entrance of the ureters and the prostate, being much lacerated by the various efforts made, to force the legs of the forcep within its cavity, for the purpose of seizing the stone, suffered extensive infiltration, followed by inflammation and sloughing of the cellular substance within the cavity of the pelvis.

The consequences of the operation became manifest in a

few days, by occasional discharges of a fluid of an excessively fœtid character, consisting of blood, pus, and urine; with swelling, soreness and pain in the lower portion of the abdomen, but especially in the left side just above the groin. The erect posture was found necessary to encourage the escape of this fluid; and when the patient was placed upon his feet, which was done from twice to four times in the twenty-four hours, a gill or more would frequently escape at a time, having a pungency and a fœtor almost without a parallel. On two or three occasions, between the sixth and twelfth day after the operation, and immediately preceding and during the successive sloughs of the soft parts in the perinæum, consisting of muscles, urethra and cellular substance, he became transiently and alarmingly prostrate, with feeble, frequent pulse, and vomiting, obtuse vision and deafness. Little could be done for the general system, during this critical stage of the local parts. By means of copious, often repeated, and long continued ablutions of warm water, to the lower portion of the abdomen and perinæum, the urgent symptoms were always greatly alleviated, and at the end of six weeks the patient was restored to perfect health. As a consequence of the loss of all the bulbous portion of the urethra, and accellerator muscles, but little power remained of propelling his urine to a distance from his feet, and from this circumstance he thought himself unfit for matrimony. He soon changed his mind, however, and has now a large family of children. But while this case is given in order to show that position does not under all circumstances maintain the patient free of infiltration, with its distressing and dangerous consequences, it does not in any respect militate against its efficacy as applicable in general practice.

In most instances where large calculi are extracted, the bladder is left for a time, by reason of the violence done it in the operation, incapable of acting upon its contents; and during this temporary suspension of its expulsive power, it is desirable the urine should have a free and unobstructed passage through the external wound. With this view, after every operation, the patient should be confined upon his left side, un-

til by the secretion of coagulable lymph throughout the whole extent of the wound, a barrier is thus constituted against infiltration of urine; for if the communication between the cavity of the pelvis, and that of the bladder be more direct than that through the external wound, it is clear the patient is in immediate danger; but when the position on the left side is maintained, whether the bladder has suffered a temporary suspension of its active power or otherwise, no accumulation will ordinarily take place in its cavity, since, according to the common principle of gravity, the urine will escape with almost the same regularity which governs this secretion.

After all the observations I have been able to make upon the different modes of performing the lateral operation, together with the various instruments that have had each a preference among the surgeons of most distinction, I cannot withhold my approbation of the gorgets of Mr. Cline. These are received as superior to all other instruments bearing the name, from their greater simplicity in construction, and because they are conceived to answer most perfectly the intent of the operator. The gorget is a knife which makes the incision as it enters the bladder; nor does it make one of less or greater dimensions than is designed by the operator, but precisely of the extent proposed.

In using the scalpels of the different surgeons, the incision is made after entering the bladder by means of a lateral movement of the hand, and consequently more to the hazard of the patient, inasmuch as it is subject to all the casualties from different degrees of resistance in the parts to be divided, from their remoteness from the surface, from their size, from the length and breadth of the blade of the scalpel, and from the manner of holding it. Who could pretend to accuracy in a piece of dissection carried on upon parts, to reach which, the instruments are passed through an obscure medium? And yet the operation for calculus with the scalpel is commended to public approbation, notwithstanding the remoteness of the parts to be operated upon deprives the surgeon of all the advantages of sight and touch, the two senses by which he is governed in all his operations.

There is no correspondence between the opening made by the gorget in the bladder, and the calculi to be extracted, as these vary from the size of a kidney bean to that of an ordinary orange in magnitude. But the advantage insisted on in favor of the use of the gorget, consists in the relative safety of the patient against hæmorrhage, or infiltration, with consequent inflammation and sloughing. Let the prostate gland be enlarged or of its natural size, indurated or broken down, inflamed or healthy, the incision made by the gorget cannot vary in extent or position. The staff being held firmly in one hand, while the other directs the gorget into the bladder, no varying condition in the anatomy of the parts, can in any respect effect the extent of the incision. It may, and is often found to be, too small for the passage of large calculi, and an important principle is there involved, while that laid down by many authors of distinction cannot be regarded as correct in practice. Incisions made with sharp instruments are more inclined to heal by the first intention, than bruised and lacerated wounds. The former under favorable circumstances are followed by a small degree of inflammation; the latter necessarily requires more, in order to relieve the bruised and lacerated surfaces from the violence done, as preparatory to re-union.

But if in the former there is great additional danger incurred from hæmorrhage, or from infiltration of urine followed by inflammation and sloughing, dangers consequent to the uncertain extent of the incision made through the prostate gland and neck of the bladder with the scalpel; then the whole aspect of the subject becomes changed, and the question comes up for decision, between the dangers proceeding from hæmorrhage, infiltration and inflammation with sloughing, in an incised wound on the one hand, compared with a bruised and lacerated wound on the other.

There can be no difficulty in deciding in favor of the comparative safety of incised wounds generally. No one doubts the additional danger proceeding from contusions and lacerations of wounded surfaces. It is in this particular especially, that a gun-shot differs from wounds inflicted by the small

sword, sabre or bayonet; and while surgeons may encourage the latter, to heal by the first intention; they as uniformly keep the gun-shot wound open, in order to favor the discharge of the dead parts along the line of the bullet. Without this precaution, under ordinary treatment, great additional pain, swelling and constitutional derangement are apt to ensue in these wounds, which by many are believed to be of a specific character; and which from their supposed peculiar nature, are encouraged in the sloughing process, as necessary to restoration.

The position of the wound in the bladder is especially favorable to the healthy recuperative processes of nature, and offers in itself an admirable subject for reflection to the surgeon, on an improved treatment of wounds of a like description elsewhere. Uniform warmth and moisture are secured to the wounded surfaces of the parts; nor are they entirely destitute of the advantages of pressure. In gun-shot wounds all the ordinary actions, consisting in inflammation, swelling, sloughing and granulation, by which the parts are finally restored to health, may be superceded by the direct process of adhesion, wherever mechanical pressure can be constantly and efficiently applied, and this is aided by the advantages of warm ablution. Mortification of the surface of a gun-shot wound is an incidental consequence, and may be prevented in most cases of wounds of the extremities. Even when complicated with fracture of the humerus, extending into the elbow joint, the adhesive process has been established by the bandage, kept wet with warm water, and thereby the compound reduced to the state of a simple fracture. The innocent character of the violence done to the bladder, in extracting large calculi through small openings, when compared with the history of a gun-shot wound, must be manifest to the most superficial thinker. Lacerated wounds upon the surface of the body are often observed to heal kindly. We are taught this, among a number of cases, by the instance of an individual whose arm and shoulder-blade were dragged off from his body; and in not less than sixty out of the whole number of those who

have submitted to the operation of lithotomy, calculi were extracted, the dimensions of which would require, but for the yielding of the parts, an incision which would have endangered in every instance, the plexus of blood vessels on the lateral portion of the bladder; and yet the opening in the bladder in these cases, was made by the gorget of Mr. Cline of medium size; an instrument not large enough to exceed the lateral limits of the prostate in the full grown subject, and in the use of which the blood vessels on the side of the bladder were not exposed to danger. An incision in the neck of the bladder from one-half to three-fourths of an inch in length, the precise extent being somewhat regulated by the nature of the urethra and prostate gland, answered for the extraction of calculi, varying from four to nine, and in one instance—the case of Steele already noticed—eleven inches in circumference. Notwithstanding the necessary laceration of these parts, in the passage of the calculus through the wound, yet every one recovered; while there was no difficulty from infiltration and inflammation, except in four cases. Parson King, residing on the banks of the Cumberland, a man seventy years of age, of short stature and remarkably large and heavy, submitted to the operation of lithotomy, and had instruments introduced into the bladder not less than twenty times before all the calculi, thirteen in number, were extracted. The great depth of the wound in order to reach the bladder, together with the embarrassment proceeding from a pelvis of unusually contracted dimensions, created much difficulty in the search after, and the extraction of the calculi. But after he was placed in bed, not a drop of urine escaped by the wound, while it was necessary to introduce a catheter to draw it off, as often through the day and night as seemed proper, in order to prevent painful distention, and to guard against infiltration.

At the end of the sixth day from the operation, the bladder assumed its control over its contents, when the catheter was discontinued, and in a week more the patient was well.

Doctor Burnett of this vicinity had the forceps introduced not less than forty times, for the extraction of thirty-one cal-

culi of various sizes; and yet before the tenth day the bladder was closed, and the outer wound cicatrised by the twentieth from the operation. One of the earliest settlers of this city, when in the seventy-third year of his age, a large man, weighing two hundred and thirty pounds, submitted to the operation, and had a calculus taken from him of two and a half inches in diameter. The extreme depth of the perinæum, the prostate being beyond the reach of the finger, made it necessary to direct the forceps into the bladder by means of a director, and the size of the calculus, when contrasted with the contracted nature of the wound through the bladder, prostate and parts more superficial, rendered the grasp of the calculus with the forceps a difficult achievement. After a long and varied effort, during which the bladder and prostate were dilated and lacerated, the opening was made large enough to admit of its extraction. But the force used with the forceps was sufficient to have drawn the patient off the table, and yet he recovered in the usual time, and without any untoward symptom: no sloughing, and not so much inflammation as to call for evacuant remedies, or even the use of warm ablutions to the groin and perinæum, supervened.

Cases like the preceding can scarcely admit of misconception; and they are calculated to sustain the merited confidence of the profession in the lateral operation: but the great amount of fatality attending it in the large cities of Europe, under the hands of the most distinguished surgeons of the two great capitals, has no doubt exerted a large share of influence in originating a treatment, whereby a cure is proposed, without the necessity of using any cutting instruments. This operation of Civiale is pressed upon a credulous public, not so much on account of conclusive arguments to establish its intrinsic merit, as from the want of success, and the unpopularity of that which is more generally in practice. The fearful consequences of all extensive wounds in large and crowded cities, such as London and Paris, and the great mortality consequent on many capital operations in surgery, is well calculated to suggest innovations in the principles and practice of

the profession, tending to curtail the use of the knife. And although the operation of Monsieur Civiale is in conformity to this principle, which for a long time has constituted a rule of practice, among the surgeons of London and Paris, in injuries of the head, and in fractures, still, however its advocates are very few in number, while it is even condemned in the French capital, where, if it were entitled to credit, that credit would certainly be bestowed. Inflammation never takes place, to an injurious extent, after an operation in a pure atmosphere, provided the patient has been prepared by appropriate medicine, and by proper restrictions in food, both in quality and quantity. When all the organs of the body are in the exercise of their healthy functions, the only struggle after an operation, is made by nature with a view to restore the integrity of the parts operated upon: and however great the violence sustained in the part, as a consequence of the operation, provided there is no diseased link in the chain of animal associations, there will be no response in the general system indicating disease; while all re-action will be confined within the limits of the restorative efforts of nature. But provided all recuperative power is destroyed in the part operated upon, the shock of the general system, and the danger, will correspond to the extent, and the location of the sloughing. The recognition of this principle is calculated to add in a material degree to the safety of him who may become the subject of a capital operation, at the same time that it composes an important item in the materials constituting the science of surgery.

Out of the whole number of those upon whom the operation has been performed, there are three youths who got out of bed with incontinence of urine; and although this mortifying result of the operation, was watched in each case, for several years, with the expectation that at puberty, if not before, the part might regain its retentive power, yet by reason of a change of residence, I have lost sight of their history, and am not prepared to state at present, what change may have been the consequence of puberty upon them. The calculus

was not large in either instance, nor was there any occurrence in regard to the character of the operation, the use of the forceps, in the extraction of the calculus, or the subsequent treatment, which could lead to an explanation of a defect in the bladder so distressing. It is presumed to have originated in some morbid union of the parts divided, at or about the neck of the bladder: but upon the cause to which this is attributable I am totally uninformed.

In performing the operation of lithotomy, it is always desirable with me to reach the groove in the staff, while this instrument is firmly held in a perpendicular attitude by the assistant; care being taken not to incline it either way from the centre of the perinæum. The instruction of some surgeons who require that the convexity of the staff be made prominent in the left side of the perinæum, in order that the incision shall be directed directly upon it, appears to me to be the result of false reasoning upon the subject.

An opening more central in the perinæum secures, to a greater extent, the facility of using forceps in the extraction of the stone; and after the patient is placed in bed, there is an advantage in the strait-lined character of the wound, from the superficies to the bladder. The neck of the bladder is equidistant from either ischium, and as there is nothing in the anatomy of the parts, which can forbid an incision being made to correspond with it, there should be no hesitation about adopting this manner of operating; especially when it is known to offer greater protection to the pudic artery, and also to furnish a more direct opening for the escape of urine, whereby the patient is maintained more secure against the consequences of infiltration.

The fear of injuring the rectum should not be urged as a reason for protruding the staff into the left side of the perinæum in the operation of lithotomy, inasmuch as different causes, not to be counteracted, all in the same manner, conduce to throw the bowel more or less in the way of the scalpel. Among children, who from bowel complaints, or the distress occasion-

ed by the calculus, become the subject of prolapsus ani, the rectum is in danger in the operation, and often requires to be held out of the way by the left hand of the surgeon, while he is engaged in making the incision into the groove of the staff with his right. This part of the operation being completed, it is conceived that no danger is incured in the use of the gorget, which instrument is conducted into the bladder by a forward movement of the right hand, and a reverse motion with the left, which commands the staff. By a happy association of these powers, bearing in mind at the moment of execution the inclinations of the under and upper strait of the pelvis, the surgeon cannot under any circumstances be defeated, nor the patient put in danger by a wound of parts not necessary in the operation.

The propriety of having due regard to the axes of the superior and inferior straits of the pelvis, in all examinations of the organs therein contained, and in the operations to be performed upon them, will scarcely be questioned. It is but a short time since a gentleman travelled from a distant quarter of the Union by the advice of one of the most distinguished physicians of the state in which he lived, in order to be operated upon for *calculus in the bowels*; bringing with him the instruments including *sound, forceps, &c.*, with which repeated efforts had been made by his physician to remove the supposed calculus. Such an error could only have been committed by one who had failed to attend to the axis of the inferior opening of the pelvis, and who, most probably, mistook the resistance his instruments encountered in the concavity of the sacrum, for a stone in the bowel. The patient had been the subject of deranged digestive organs, with difficulty in maintaining the freedom of his bowels. Being himself a physician, the introduction of his own instruments, very far beyond the imagined locality of the calculus, which had not been previously done, together with some explanation given of the peculiarity of his situation, enabled me to satisfy the patient of the error that had been committed; and by the use of appropriate diet and medicine he regained his health in a few months.

There is another state of the soft parts, which renders the operation of lithotomy hazardous, and in which nothing can be gained by throwing the convexity of the staff into the left perinæum. In emaciated habits the perinæum becomes a concavity, of which the anus is the centre; and the inclination of the integuments from the tuberosity of the ischium to the constrictor ani, causes great difficulty in guarding the pudic artery from being wounded on the one hand, and the rectum on the other. The operation being performed in such cases across an inclined plane, the safety of the parts is preserved only by *drawing off the rectum with the fore-finger of the left hand, at the moment that the incision is made with the scalpel in the right*;—a precaution which the deliberate and cautious operator will not fail to observe, and without which the rectum is in the utmost danger of being wounded.

But after all that may be said in favor of particular modes of operating, and of the instruments to be preferred, it is by experience alone that this question must be decided, and hence the value of faithful records. With the exception of two who were operated upon in Tennessee, one on the banks of the Cumberland, one near Bardstown, one near Richmond, and one in Paris, Ky., all the cases to which allusion has been made in this paper, were attended to in Lexington. One hundred and twenty of this number occupied the same apartments, and were under the charge of the same nurse. The remaining seven were operated upon, and attended to, in different parts of the city.

Out of the entire number, on whom the operation has been performed, four individuals failed to enjoy its benefits. One died of *pleurisy*, the consequence of laying off his flannel and exposing himself too early after leaving his bed. The second from *abscess of the kidney*, with great swelling in the lumbar region, which was thought, possibly, to originate in an obstruction of the ureter, and might therefore be relieved by the removal of the calculus from the bladder. The case being interesting, it is here related at length:—The patient, a young man from Bardstown, had been the subject of stone from his

earliest infancy, and for the last two years had suffered much from pain and weakness in the small of his back. A few months before coming to Lexington, an extensive swelling became manifest in the right lumbar region. Upon the first examination of this case it was clearly ascertained that the swelling contained a fluid. The integuments over it, were neither morbidly sensitive, nor discolored; and in the absence of symptoms indicating clearly the nature of the fluid, it was thought that the stone in the bladder might possibly have obstructed the ureter of that side, and caused a great enlargement of the ureter and pelvis of the kidney. Parallel cases had been met with in the gall-bladder which strengthened somewhat this doubtful opinion.

Accordingly after a few days bestowed upon the preparatory treatment of the patient, the operation was performed, and a calculus of some magnitude was extracted, without, however, in any respect changing the swelling in the back. The wound in the bladder closed in a week; but in a few days after that, the patient was attacked with diarrhœa, irregular fever, and copious perspirations, which resisted all the remedies that were resorted to, and in fifteen days more he died. Permission was obtained to examine the body. An incision directed upon the centre of the swelling exposed a cavity, that reached from the root of the liver to the bones of the pelvis, the walls of which were made up of peritoneum greatly thickened, and of the integuments of the side, and lumbar region; the muscles having been absorbed. The kidney of that side was entirely absorbed, and the sac contained one gallon measure of pure pus.

The third died from *inflammation of the kidneys*, supervening on the tenth day from the operation, with entire suspension of urinary secretion, and death on the 17th. The following are the particulars of this case: A large muscular man, from Bourbon county, submitted to the operation of lithotomy, and had a stone taken from him of medium size. No occurrence during the operation took place, nor was there any thing in reference to the general condition of the patient, in any re-

spect calculated to excite doubts about his speedy recovery. Accordingly by the seventh day from the operation, the bladder closed, and the urine resumed the proper outlet. But, in about three days, on the fourth day after the wound of the bladder healed, he complained of passing no urine, and never after passed a drop from his bladder; while the secretion by the kidneys was manifestly suspended. In six and thirty hours, fever supervened, and shortly after his person and bedding became offensive with a urinous odour. For four days he was the subject of more or less delirium and lastly died comatose.

The fourth one died from disease of the liver; and one from disease of the liver and digestive organs, after a protracted illness. No one has ever died in my charge before the bladder had closed or within the ordinary period required for the healing of that organ.

The time required to perform this operation is a subject worthy of particular attention. All unnecessary delay in the execution of one so important in its consequences, and in which the position of the patient is so distressing, should be guarded against as much as possible; but the conduct of the operator cannot be otherwise than highly censurable, who should exert himself more with a view to rapidity in the execution, than safety in the result. Sir ASTLEY COOPER observing a pupil on one occasion to hold his watch, in order to ascertain the time employed in the operation of lithotomy, turned to his class after having completed it and observed, that while it was executed in two and a half minutes, that circumstance afforded but little evidence of skill in the operator, or of safety on the part of the patient.

In the discharge of his duty, the surgeon must occupy time in proportion to the difficulties to be encountered, while *he* is most worthy of confidence, who, in cases of unexpected embarrassment and dangers, is most prompt in the application of rational correctives. There are to be found among surgeons, as well as in other classes of society, men whose hand, and whose intellect, are palsied by sudden, unforeseen, and hazardous occurrences; as there are others whose senses, under similar circumstances, become more acute, whose minds draw

with rapidity upon untried resources, and whose reasoning is like an intuitive impulse. To this latter class, society is indebted for the higher achievements in the profession. The operation of lithotomy is often performed safely, in the time occupied by Sir ASTLEY COOPER, but it can only be executed with such rapidity upon the most favorable description of patients.

In six different instances, I have operated on two patients, in immediate succession, and did not with any couple, occupy more than twenty minutes; including all the time bestowed upon the preparations for the second, after the first patient was removed from the table. On one occasion, three subjects were ready for the operation at the same time. One, a man of sixty, another of seventy-five, and the third a boy ten years of age, all of whom were operated upon in the same chamber, in less than forty minutes, including the time engaged in making preparation for each. At another time, three were ready; and when two of them had been operated upon, the third could not be found, having absconded from fright; otherwise it is possible the whole number might have been placed in bed in less time than the first.

There can be no doubt that patients are lost from exhaustion, occasioned by the unreasonable time consumed in the operation, as well as from heedless rapidity in its execution, wherein the safe limits for the incision in the perinæum and bladder are not observed. I have had a patient placed in bed in less than three minutes after the first incision was made; but in other and very embarrassing cases, it has cost the labor of fifteen minutes to accomplish the same;—such is the variety of obstacles to be encountered in executing the operation of lithotomy. As a general remark, the calculus is found immediately at the neck of the bladder, where it is placed by the contraction of that organ succeeding to the operation; consequently it occupies a position favorable to be seized by the forceps. Too often, however, it declines deep towards the concavity of the sacrum, where it becomes more difficult to direct the instruments upon it: and I have known the calculus,

in a large, lean subject, thrown forward and upwards and to rest upon the symphysis pubis, where, after some time, and not without difficulty, it was detected with the scoop.

The period of confinement after the operation is very various, and until the recovery is complete it is necessary to bestow particular attention on the general health—a precaution demanded not only with a view to speedy recovery from the wound, but also to maintain the union of the parts after it has taken place. A deranged state of the general system, accompanied by fever, is well calculated to excite the absorbents in the line of the incision; and thus by ulcerative absorption, re-open the bladder. In consequence of such a state of health, the wound in a gentleman of this city, who was the subject of the operation, was opened by ulcerative absorption, four or five times, in the space of the first four months after the operation. A young man of vigorous constitution and fine health, after recovering from the operation, proposed to return home on foot. After prosecuting his journey seventy miles, he was attacked by fever, from exposure and over exertion, which was soon followed by ulcerative absorption in the wound, so that he was confined a month, before the bladder closed and cicatrised a second time. It is desirable in this, and most other operations, that the wound should close and cicatrise as speedily as possible. Union by adhesion, the first intention of the authors, curtails very much the labor of the surgeon, and adds greatly to the safety and comfort of the patient: nor is the period of confinement a subject of minor consideration. On the contrary, any plan whereby the time necessary to effect a cure may be lessened, will be received by the profession, and by the sick, in the light of a boon of inestimable price. It will not be disputed that some very rare cases occur, wherein union by the first intention, might, by obstructing the passage of soft calculous material by the wound, expose the patient to a return of the malady. I have seen one case in point, in which a doughy calculus escaped with pain and difficulty through the wound on the tenth day, and again a similar discharge on the fifteenth, after

the operation; corresponding with a similar case described by Sir ASTLEY COOPER in his lectures, as occurring under the charge of one of the surgeons of Guy's Hospital. But these cases are so rare that they cannot be urged as objections to the practice of healing the bladder as speedily as possible. The mode of accomplishing this should not be misunderstood. It certainly does not depend upon the keen edge of a smooth cutting instrument; upon any direct correspondence between the extent of the wound and the magnitude of the calculus; nor upon the small number of times the instruments are introduced into the bladder, with a view to extract the stone, so much, as upon a prepared state of the general system to institute the healthy process of reparation; upon a bland, digestible, abstemious regimen; upon the position observed during the cure; and upon continued attention to the regular and healthy performance of the various important functions of the body, throughout the whole period of the confinement. Union by the first intention was effected in eight of the whole number of cases of lithotomy that have been under my care. Six of these had but a single calculus each; one had two of considerable size, that required unusual efforts to extricate them, and the remaining case, Parson King, had thirteen. No satisfactory reason can be assigned why many other cases, which, so far as the manifest circumstances are involved, were even more favorable to union by the first intention, have yet had a different termination.

The varieties of action, morbid as well as healthy, are like the physiognomy of man, infinite in kind and manner of expression.

ERRATA

In Dr. Dudley's paper on Calculous Affections:

Page 17, 15th line from the top for *Huertetoup*, read *Huerteloup*, and the same on page 18, 3rd line from the top.

Page 19, line 12th from the bottom, for *grooves*, read *groove*.

Page 28, line 12th from the top, for *effect*, read *affect*.

Page 37, line 11th and 12th from the top, erase "and one from disease of the liver," and read *The fourth one died from disease of the liver and digestive organs, &c.*