

Practical observations on urinary gravel and stone : on diseases of the bladder, and prostate gland; and on strictures on the urethra / by Henry Johnston.

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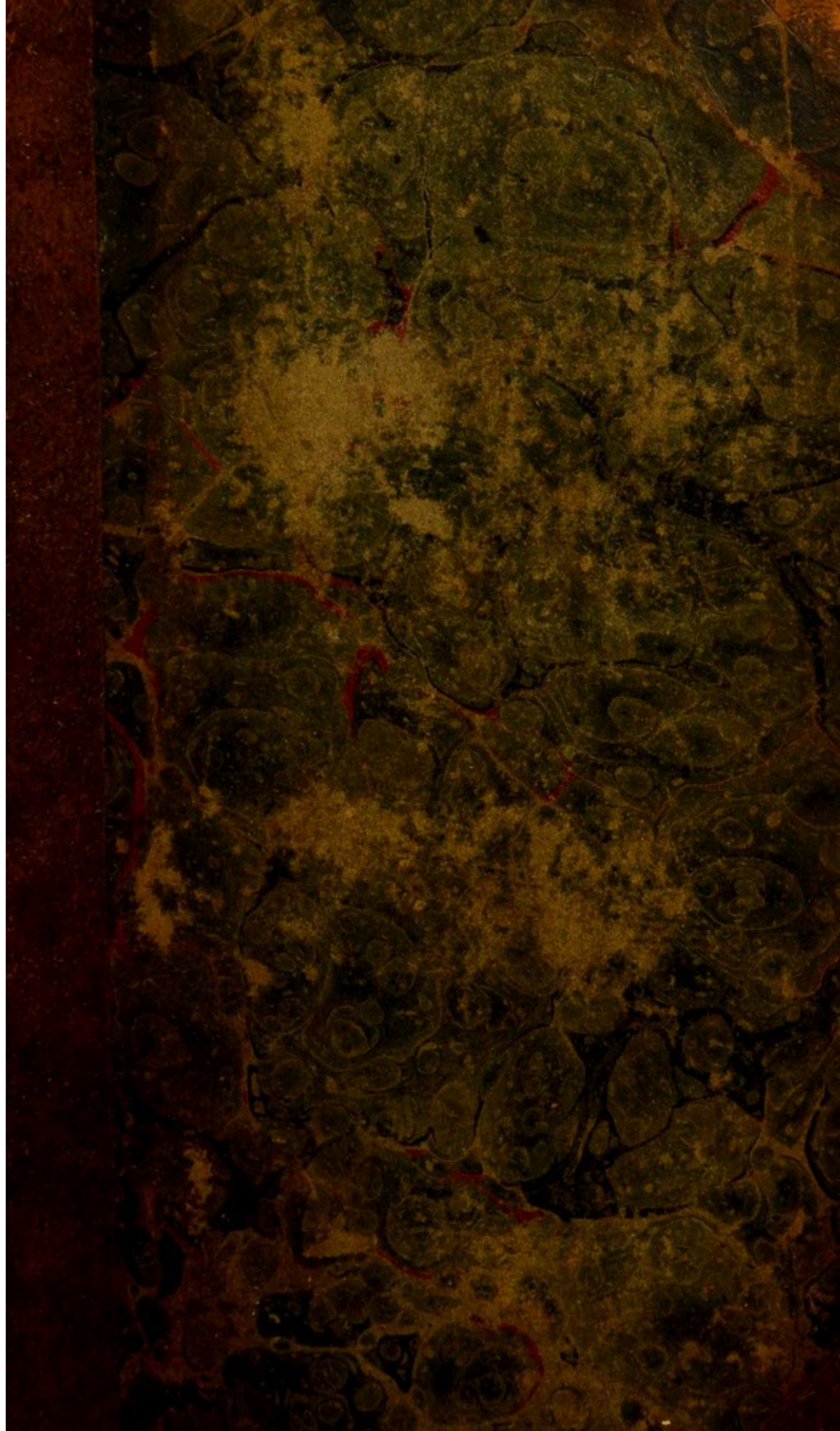
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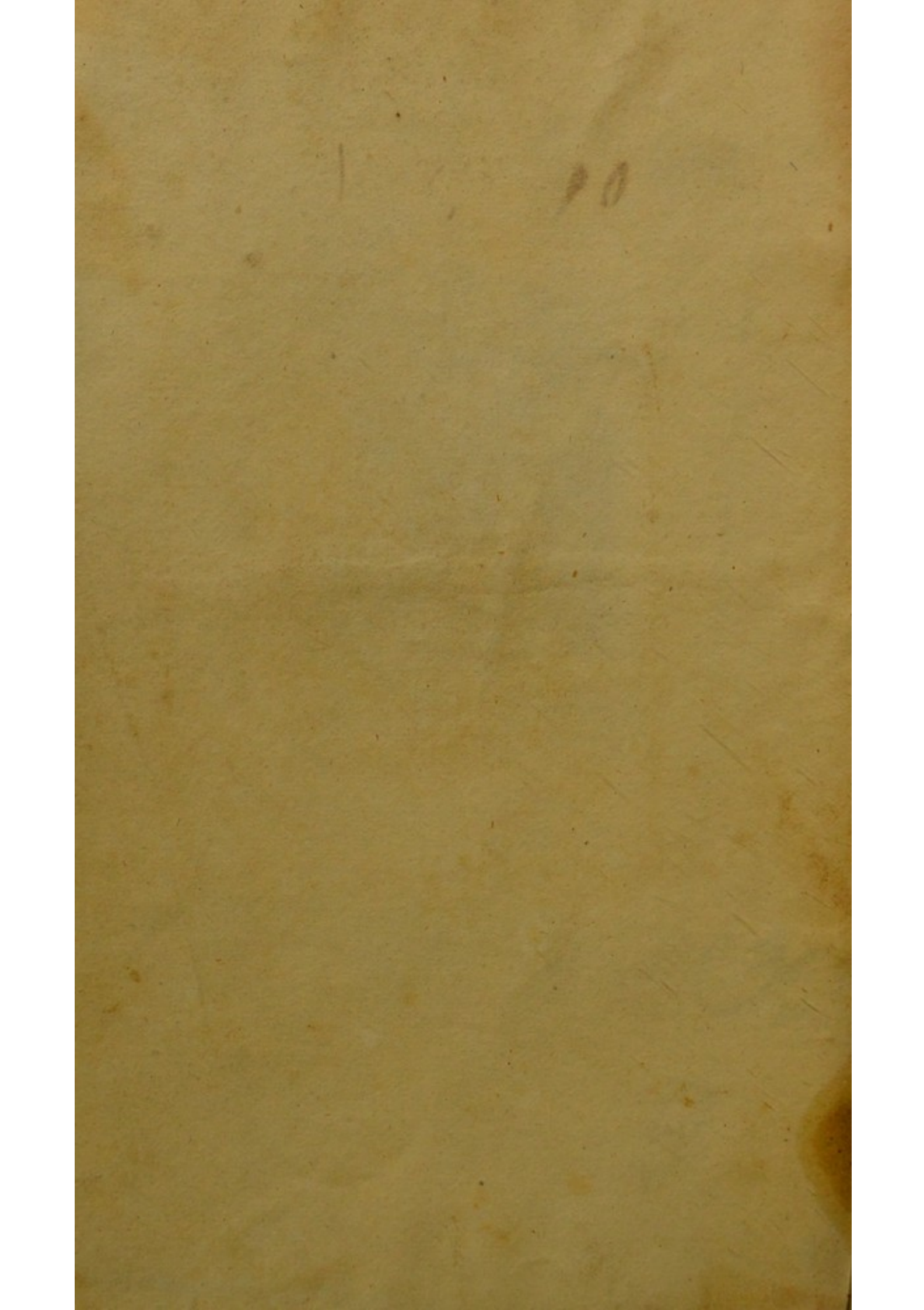
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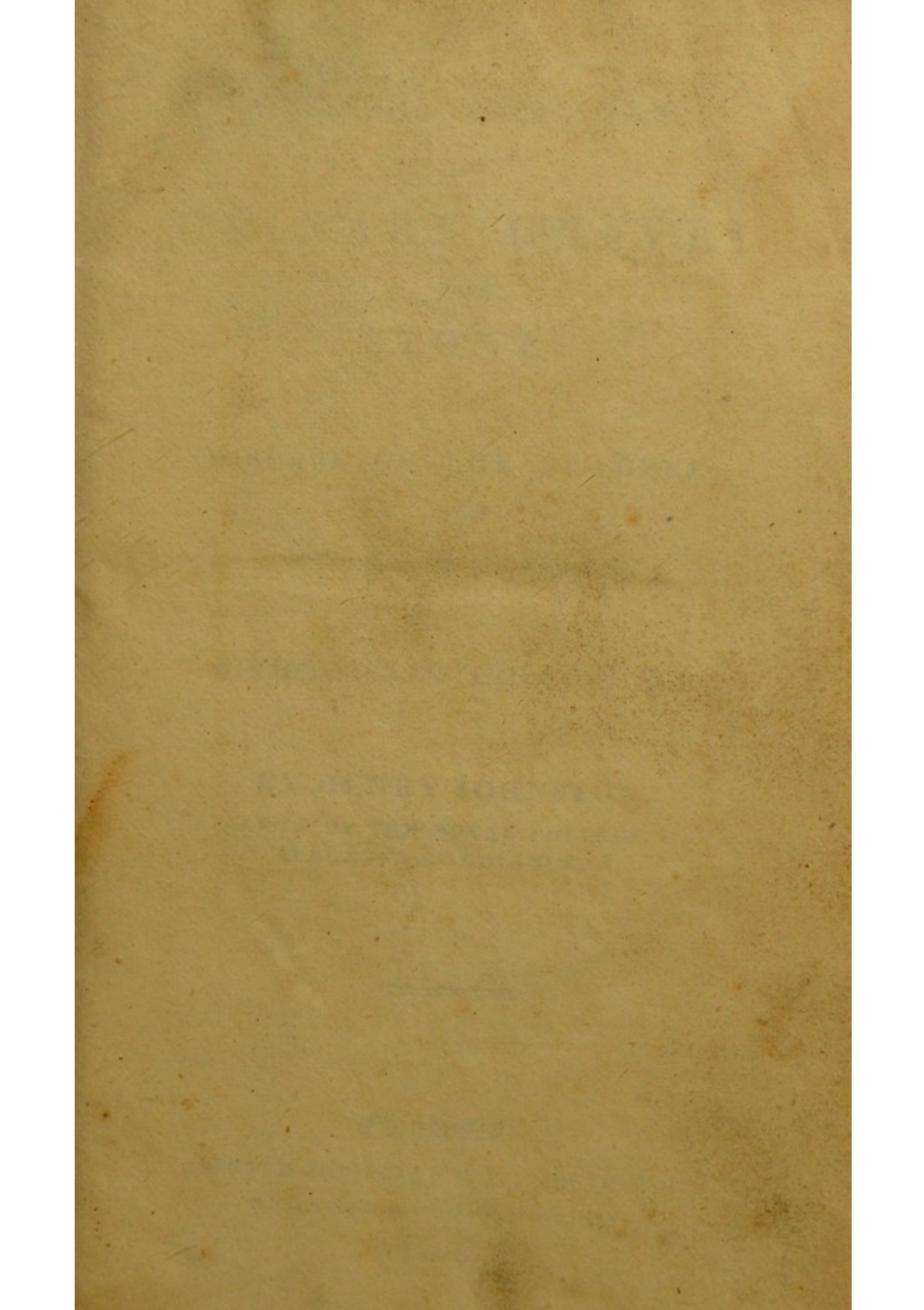
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PRACTICAL OBSERVATIONS
ON
URINARY GRAVEL
AND
STONE;
ON
DISEASE OF THE BLADDER,
AND
PROSTATE GLAND;
AND ON
STRICTURES OF THE URETHRA.

BY HENRY JOHNSTON,
FELLOW OF THE ROYAL COLLEGE OF
SURGEONS OF EDINBURGH.

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PRACTICAL OBSERVATIONS
ON
URINARY GRAVEL,
&c.

THE great importance of that branch of surgery, which embraces the consideration of those diseases, proposed as the subject of the following Observations, is universally admitted. An accurate knowledge of the rise and progress of these complaints, with the proper method of treatment applicable to each of them, is of the greatest advantage to the practical surgeon.

Few diseases are more common than those of the urinary organs, more troublesome in their management, or, in general, more difficult of cure. The slightest disorders of these parts seldom fail to occasion both anxiety and inconvenience, whilst there are others of a more serious nature, which give rise to very great and long continued misery, often terminating fatally; hence their alleviation and cure have ever been objects of much solicitude.

In common with other parts of the body, the urinary organs are subject to various diseases, arising from accidents, inflammation, or other causes, the symptoms attending which are plain and obvious; the proper method of treatment clearly pointed out; and, for the most part, well understood: but they are also liable to complaints of no unfrequent

occurrence, which are not always to be easily distinguished from each other. These are principally gravel in its different stages, from the urine loaded with sandy matter, to confirmed stone ; contractions, thickenings, scirrhusities, and ulcerations of the bladder ; affections of the prostate gland ; to which certainly may be added, strictures of the urethra.

The symptoms accompanying these different disorders are found to be very similar ; and hence there arises great risk of confounding them with each other. To avoid this, the strictest attention and care are called for, and from the want of these, there is too great reason for believing that serious mistakes do sometimes happen.

The frequent occurrence of these diseases may, in a great measure, be ac-

counted for, from the complicated nature of the organs secreting and excreting the urine, and from the peculiar condition and acrimony of the excretion itself, which, in the healthiest state of the body, is known invariably to contain all or most of the substances, that enter into urinary concretions.

It is chiefly, perhaps, in the more early stages of the diseases to be treated of, that misconception of their real nature is apt to occur. Their first approaches are in general slow, and not exciting much uneasiness, are often, in this state, viewed too superficially: for example, the irritation arising from an early state of stricture in the urethra, increasing gradually, and not appearing to be immediately occasioned by neglected or ill-treated gonorrhœa, nor by other evident exciting causes, more

especially if this should happen in the decline of life, is not uncommonly ascribed to gravel. The occasional attacks of spasm, and other symptoms of irritation, are alleviated for the time, by the same means which most effectually give relief in attacks of gravel, namely, by opiates taken into the stomach, opiate injections, the warm bath, rest, and gentle laxatives; and thus an erroneous opinion of the complaint is not only confirmed in the mind of the patient, but is sometimes impressed upon the medical attendant. Accordingly, instances are met with of persons having long laboured under supposed gravel, where the discovery and removal of strictures in the urethra put an end to all symptoms of distress.

In like manner, the sufferings produced by a diseased state of the coats of

the bladder, are very often, indeed in the early stages of the disorder, almost universally ascribed to the presence of gravel. Under this mistake, a mode of treatment may be long pursued, that will have no effect in retarding the progress of the disease; and those measures neglected which might have accomplished this end, if the real nature of the complaint had been understood, and early attended to.

A diseased state of the prostate gland is not perhaps so frequent an occurrence as at first one might be apt to suppose: however, when its posterior part has become considerably enlarged, it generally, by compressing the urethra, gives the same impediment to the full and free flow of urine from the bladder as arises from stricture; the same obstacle to the

introduction of a bougie or catheter is experienced; and, if due attention be not given to the precise point of obstruction, examining carefully, at the same time, if necessary, with the finger in the rectum,---the presence of stricture will very readily be inferred. That such mistakes have been made, there is too much reason to believe, and it is unnecessary here to dwell on the mischief likely to arise from attempting a cure under such misapprehension, perhaps by long continued and persevering applications of lunar caustic.

Every surgeon of any experience knows the difficulty which at times is met with, in endeavouring to ascertain the presence of a stone in the bladder. All the symptoms constantly attending this melancholy disease may be considered equivocal, and will be found often to arise

from other affections of these parts, particularly from thickening and induration of the coats of the bladder. Even the operation of sounding, to serve as a sure means of indication, requires to be done with great circumspection ; because the sensation communicated to the surgeon through the instrument, from this diseased state of the bladder, is by no means unlike the obscure feel of a stone there, and most distressing mistakes have been the consequence of a rash and hasty judgment in such cases.

Not only are the symptoms of these various complaints at all times much alike, but very often they are combined with, and seem mutually to give rise to each other. Thus the irritation produced by the frequent passage of calculous matter, or from disease of the bladder, seems to give a strong disposition to the formation of strictures in

the urethra. There is also strong reason for belief, that long continued strictures frequently induce that particular action of the kidneys and bladder favourable to the production and separation of redundant uric acid, which is the principal substance in the composition of the greatest number of urinary concretions. The long continuance of strangury, and other symptoms of irritation arising from strictures of the urethra, do also frequently give rise to thickening and contraction of the coats of the bladder, and sometimes to enlargement and ulceration of the prostate gland.

Thus a combination of these disorders, when any of them have been of long standing, will very frequently be found in the same case; and either for the proper application of remedies, or for forming a prognostic of the probable

chance of a cure, it will evidently be of much importance to ascertain which is the primary disease. This can only be done by a careful inquiry into all the circumstances, tracing every symptom from the first appearance of the complaint. Indeed, from every thing which has been said, it will appear, that few cases can occur where such an attentive investigation will not be necessary, in the course of which, little or no weight should be given to the previous impressions of the patient, as to the nature of his complaints, but every means should be used to obtain otherwise a clear and satisfactory knowledge of the real state of the disease.

The present state of medicine and surgery exhibits many advances towards a more accurate knowledge of the nature of these disorders; and, in the treat-

ment of some of them, most important improvements have, of late years, been introduced into practice. They have employed, too, the talents of many eminent writers, in whose works much useful information is to be found respecting them; still, however, it may be of utility to present a concise view of the whole subject, to point out distinctly the circumstances attending each modification, and to explain the practice which has been found, or may be considered most likely to remove or alleviate complaints so formidable and distressing.

CHAP. I.

OF GRAVEL AND STONE.

OF the preceding complaints, gravel and stone have unquestionably been reckoned the most frequent, and, in some of their stages, are surely the most formidable. The misery they occasion is too well known. No age, nor condition of life, is exempted from their attacks; and hence means of alleviation, and of cure, have, at all times, been eagerly sought after, and for these purposes a multiplicity of remedies has been recommended and employed.

Much is due to the industry of modern chemists for our present state of

knowledge as to the real nature of urinary concretions, by which the employment of medicines must be directed with a greater degree of certainty and precision than formerly. Prior to the time of Scheele and Bergman, the opinion entertained as to the composition of these concretions was almost universally erroneous: they were believed to consist of alkaline, earthy, or stony matter; whence the names of sand, gravel, calculus and stone, terms which are still retained in the language of medicine and surgery, although the opinion in which they originated is now fully admitted to be erroneous. The experiments of Scheele first led the way in removing this error, and in laying the foundation of that certainty as to the real nature of these substances, which, since his time, has been so fully established. Other chemists, following Scheele, have made

similar inquiries into the nature of urinary calculi, and with nearly the same result. But to the labours of Fourcroy and Vauquelin we are principally indebted for the correct and accurate knowledge we possess on this subject. Their experiments were very numerous, and the result appears very satisfactory. They did not confine their investigation to urinary concretions alone, but they also analysed the urine itself, by which they ascertained, that, in the healthiest state of the human body, this secretion is invariably composed of a great variety of substances, amongst which different acids are conspicuous, such as the phosphoric, benzoic, carbonic, and particularly that substance which Scheele terms the *lithic*, and Fourcroy the *uric acid*.

From the analysis, by the same che-

mists, of several hundred human urinary calculi, we learn that they are by no means uniform in their nature, as Scheele had erroneously imagined, but that several other substances besides the uric acid, either singly, or combined with each other, not unfrequently form a principal part of their composition. After numerous and repeated experiments, Fourcroy and Vauquelin discovered six or seven distinct substances entering into their formation, viz. uric acid, urat of ammonia, phosphat of lime, phosphat of magnesia and ammonia, oxalat of lime, silica, and an animal matter constantly found in the different species of calculi, varying in quantity, and serving as a cement to the other substances. It also appears, that in the healthiest urine they invariably detected all these substances, except oxalat of lime and silica; and hence it is inferred, that the genera-

tion of these two happens from some morbid change taking place in the secretion of the urine.

To enumerate the different genera and species into which Fourcroy and Vauquelin have divided urinary calculi, in consequence of the various combinations which they discovered of the seven substances already mentioned, were superfluous. It will be sufficient for our purpose to take a view of them only so far as the supposed solvent powers of medicines are concerned ; and in this way, according to Dr Thomas Thompson, the consideration of them may be referred to three heads, namely, as consisting of uric acid, or urat of ammonia, of the phosphats, and of oxalat of lime.

From the result of the investigations, made by Scheele and others, we are

led to believe, that calculi formed of the uric acid, are by far the most frequent. In all Scheele's experiments, he appears to have met with that kind of calculus only which is composed of the uric acid, and of an animal matter serving as a cement. Of many hundred calculi, analysed by Fourcroy and Vauquelin, a very great proportion likewise consisted of uric acid with animal matter, described as of a colour resembling wood, brownish, with shades of yellow and red, or reddish brown, but never white, grey, or black; their surfaces generally smooth, and polished, although sometimes otherwise; varying in size from a pea to a duck's egg, or larger; readily soluble in solutions of the caustic fixed alkalis, without emitting any smell; and when dissolved, are precipitated in the form of a white powder, by the addition of any of the

other acids, not excepting the carbonic. Alkaline carbonats seem to have little influence on them.

The loose or unconcreted gravel and sand, so often discharged from the kidneys of some people, along with the urine, seems constantly and entirely to consist of uric acid.

Urat of ammonia, although frequently found by Fourcroy and Vauquelin in calculi, seldom appeared to be the sole, or even the principal ingredient in their composition; and where it did appear to be so, the calculi were commonly very small. They very much resembled those formed of uric acid, but were generally of a paler colour; their layers very thin, and easily detached from each other. Their surfaces are usually smooth, sometimes brilliant and crystalline. Like

calculi composed of the uric acid, they dissolve rapidly in solutions of the caustic fixed alkalis, but with an abundant disengagement of ammonia during the solution.

The phosphats of lime, and of magnesia and ammonia, were frequently met with, sometimes separate, sometimes blended, and often united with uric acid. Calculi formed of the phosphats are described as white and friable like chalk, breaking easily under the forceps during their extraction from the bladder. They are often found of a very large size, and have been known to acquire such a bulk as to occupy entirely, and even to distend the cavity of the bladder. They are insoluble in alkalis, but are readily dissolved by the nitric, muriatic, and acetous acids.

It has already been observed, that oxalat of lime has not been detected in healthy urine ; but, joined with a large proportion of animal matter as a cement, it forms a calculus of very frequent occurrence, of very hard consistence, very insoluble, and with a rough spinous surface, supposed to resemble a mulberry, from which they have been termed *moriform calculi*. Their colour is that of dark grey, or sooty brown. They are perfectly insoluble in alkalis ; with difficulty dissolved by acids ; but may be decomposed by the alkaline carbonats.

A correct knowledge of these varieties of urinary concretions, namely, as being composed of uric acid, or urat of ammonia, of the phosphats, or of oxalat of lime, is of considerable importance in directing the application of medicines for their removal, or for alleviat-

ing the distress produced by them, especially when they are lodged in the bladder ; but this will appear more particularly, when we come to mention the method of dissolving stone in the bladder by means of injections, as suggested by Fourcroy. Upon this part of the subject, his observations, confirmed by those of others, have furnished certain general conclusions which are worthy of notice : that in hereditary or constitutional gravel, calculi almost constantly consist of uric acid ; that the loose sandy matter and gravel discharged from the kidneys in these cases, and appearing in the form of a sediment resembling brick dust, are always formed of this acid ; that where a stone forms in the bladder, having for a nucleus some foreign body forced into the bladder, and where no previous constitutional disposition to gravel existed, the concretion almost con-

stantly is formed of the phosphats ; and that the moriform calculi, consisting of the oxalat of lime, occur most frequently in children.

It is certainly not an easy matter to explain what are those circumstances of the animal economy, which give rise to the very frequent production of concretions in the urinary passages. That most of the substances detected in the composition of these concretions are invariably found in the healthiest urine, has been already remarked ; and of these substances, the uric acid is undoubtedly the most conspicuous. In a state of good health, these substances seem to bear such a due proportion to each other, that the whole are readily kept in a perfect state of so-

lution by the aqueous part of the urine. But in certain conditions of the body, particularly in that where a constitutional and hereditary tendency to the disease of gravel occurs, known by the name of the calculous diathesis, a redundancy of the uric acid appears to take place, and in such cases is copiously deposited from the urine when cooled, varying from a whitish to a brick colour, resembling sand, adhering to the containing vessel, and universally known by the name of gravel. This redundancy of uric acid occurs, however, at times, without any constitutional disposition to gravel; we perceive it particularly during certain stages of febrile disorders, and in a state of pregnancy.

According to Forbes, the precipitation of redundant uric acid, or gravel, as it is commonly termed, is occasioned by

the presence of other acids, whose chemical attraction for those substances which keep it in solution, is more powerful than the uric acid; such as the native phosphoric, the muriatic, or carbonic acids, produced by the animal economy in increased proportion, but more frequently by the presence of a foreign acid, received by the mouth, or generated in the *primæ viæ*, in consequence of debility or derangement in the functions of the stomach, and thence passing into the system by absorption. The same author remarks, that many who are subject to calculous complaints, are in the habitual use of acids; and that wherever sour fermented liquors are a constant beverage, gravel and stone have been observed to be more than usually frequent. During pregnancy, when the presence of gravel is very common, the stomach and intestines are found con-

stantly loaded with acid. The use of acid malt liquors by those subject to gravel, very often brings on a fit of the disease; and in such attacks we have the clearest evidence of great acidity in the stomach and intestines, for nothing so speedily and effectually gives relief, as the employment of alkaline medicines, the immediate effect of which is the destruction of this acid in the *primæ viæ*, and the prevention of its generation during their use.

The matter of calculus, either separated in consequence of its redundance, or precipitated by the presence of other acids, would readily run into a state of concretion, if its particles were not constantly washed off by the continual flow of the urine. But some of these particles being accidentally retained, do readily adhere to each other, and meeting with

that particular animal matter which serves as a cement, and which seems also to be superabundant in these cases, form a basis or nucleus, around which similar particles are attracted and adhere, and this process continuing to go on, all the terrible consequences of confirmed stone may, in the end, take place.

IN enumerating the symptoms arising from the presence of calculus in the urinary passages, the natural order seems to be, to trace them from the separation of loose gravel in the kidney, to confirmed stone in the bladder.

In an attack or fit of gravel, as it is called, although perhaps all the symptoms may be occasioned by one small calculus passing from the kidney to the bladder, there is commonly a great discharge of sandy matter, sometimes more, sometimes less granulated, accompanied with pain and heat in the region of the kidneys, occasional sickness, difficulty in stooping, ardor urinæ, stranguary, and other symptoms of irritation. The urine is loaded with mucus, and, upon stand-

ing, soon becomes very offensive to the smell. These attacks are very frequent in many people, without producing any serious distress. But where such a condition of the system takes place, a more formidable state of the disorder is constantly to be dreaded.

The formation of concretions in the pelvis of the kidney is by no means rare, notwithstanding the constant flow of urine washing away the calculous matter ; however, they seldom remain long there, but from the position of the parts, when the body is erect, naturally fall down into the ureter. Yet cases are met with, where, from long confinement to a recumbent posture, or from other causes, stones acquire such a size that they cannot be passed through the ureter, but remain impacted in the pelvis of the kidney, and in this situation,

upon dissection after death, they have been found of a bulk hardly credible, weighing even many ounces. Of such cases there are not a few on authentic record, in which there had been little comparative suffering by the patient: so that it would seem that a stone may remain long in the pelvis of the kidney, without exciting much uneasiness, particularly if exercise be avoided; but as it increases in bulk, it seldom fails to bring on attacks of inflammation, sooner or later ending in suppuration, gangrene, hectic fever, and death.

Happily this stage of the disease of gravel is but rare; and, for the most part, before urinary concretions have acquired any considerable size in the pelvis of the kidney, they drop down into the ureter, and if small, round, and polished, pass on to the bladder without much dif-

ficulty. If they have increased, however, to a bulk greater than the diameter of the ureter, and especially if they be rough and irregular, they produce the following train of most distressing symptoms.

An acute fixed pain in the region of the loins takes place, propagated along the course of the ureter, attended with a strong sensation of numbness in the thigh, and a rolling motion and retraction of the testicle of the side affected. Nausea and vomiting come on. At the beginning of an attack of this kind, the urine is pale and aqueous, is voided frequently, and in small quantities; and if it should happen both ureters to be similarly obstructed, a total suppression takes place. As the fit advances, the urine becomes higher coloured, mucous, sandy, and even purulent, and not unfrequently mixed with blood, either in such

quantity as readily to shew itself, or so small, as merely to give the secretion a dark coloured tinge.

During the first period of such attack, the pulse is little affected, and is only quickened by the continuance of the obstruction producing inflammation.

Whilst the pain and other symptoms, occasioned by a stone impacted in the ureter, continue, a state of costiveness, for the most part, takes place.

If the stone do not pass into the bladder, although the patient may have short remissions of his distress, these are followed by increased urgency of the symptoms; inflammation takes place; acid and bilious vomitings come on, with watchfulness and delirium, oppres-

sed breathing, cold sweats, and faintings ; great debility, paleness, emaciation, hectic fever, and death. Or, if the assertions of some authors may be credited, the urinary secretion being absorbed into the system, is discovered in the saliva and perspiration, or being effused into the brain, the patient dies comatose.

In general, however, after a longer or shorter duration of the symptoms, the stone gradually makes its way into the bladder, when a remission of distress immediately takes place, with a copious discharge of thick and turbid urine. At this time, most particular pains should be taken to promote the expulsion of the calculus through the urethra, and the patient should be directed to be careful to ascertain, if possible, when this happens. If not expelled in this way, it may lie

for a considerable time in the bladder, before it acquires such a bulk as to produce inconvenience. Its increase will depend on the greater or less redundance of calculous matter, and upon the precipitation of that matter from the urine. Gradually, however, the calculus goes on to augment, and, sooner or later, produces extreme misery. By irritating the coats of the bladder, frequent and most urgent calls to evacuate its contents are excited. The expulsion of urine is very painful, in consequence of inflammation propagated through the course of the urethra, and of the internal membrane being deprived of its defending mucus. Whilst flowing in a full stream, the urine often suddenly stops, or perhaps comes away by drops, in consequence of the stone falling upon the opening of the urethra; and hence the urine is discharged with more ease whilst the patient reclines,

than during an erect posture. The constant irritation kept up by the stone, occasions a great secretion of mucus, with which the urine is loaded ; and its qualities having undergone a change, from the diseased action of the vessels, it readily becomes foetid. After any irregularity, exertion, or exercise, the urine is often bloody, and even drops of pure blood are sometimes discharged.

One of the symptoms, considered most characteristic of a stone in the bladder, is a peculiar tickling sensation in the urethra, near to the frænum, and which seems to arise from nervous sympathy. This, and the sudden stop of the flow of urine, are, independent of the trial by sounding, reckoned the surest and most unequivocal of all the indications of a stone in the bladder. But it must be observed, that this sensation near the

point of the urethra, is also frequently present in any state of disease producing irritation about the neck of the bladder, and, particularly, it is a very common attendant of strictures accompanied with frequent spasm.

When the stone has acquired a considerable bulk, and by its weight presses upon the rectum, it occasions troublesome tenemus, purging, and prolapsus ani.

In many cases, stranguary, and other symptoms of irritation are constant, and resemble very much the same symptoms arising from strictures of the urethra, and from diseased bladder. Indeed, stone in the bladder not unfrequently gives a disposition to the formation of strictures, by the constant irritation and spasm kept up in the urethra. All the

symptoms, therefore, of a stone in the bladder must be viewed as uncertain, and a complete and careful examination with the sound, must be adopted as the only sure means of ascertaining its presence.

In the different stages of gravel and stone, the urgency of the symptoms will depend greatly on the shape and surface of the concretions. When round and smooth, they are frequently passed in considerable numbers, and of pretty large size, without creating much suffering; but when they are irregular, rough, and pointed, the pain produced is often most excruciating.

Where all, or several of the symptoms which have been enumerated as attending the different stages of this disorder, concur, they mark the presence of gra-

vel and stone with sufficient clearness ; but, individually, they must be considered equivocal, and liable to be confounded with the same symptoms arising from other diseases. A stone detained in the pelvis of the kidney, and acquiring such a bulk that it cannot be discharged through the ureter, is not a frequent occurrence. When it does happen, unless means be employed to prevent its increase, it will, for the most part, become very formidable. It has been already seen, that a stone may long remain in this situation without occasioning much severe distress ; and it may happen, the attending symptoms to have a strong resemblance to affections of the kidney arising from other causes, such as chronic inflammation, enlargement, and induration. Deep seated inflammation and suppuration in the psoas muscles, or other neighbouring parts, may also

be confounded with it. Even rheumatic affections there may be mistaken for it. Much information of the real nature of the disorder may be drawn from a minute inquiry into all the circumstances preceding and accompanying it. The suspicion of a stone being so lodged in the pelvis of the kidney, will be strengthened by a knowledge that the patient has an hereditary and constitutional disposition to gravel, and has at various times passed calculous matter, and small concretions.

The symptoms of a stone obstructed in its passage through the ureter are less equivocal. The pain, although acute, coming by intervals, and the little disturbance of the pulse, at least during the early stages of an attack, with the very opposite condition of the urine, which, at the beginning of an attack from cal-

culus, is thin and aqueous, in nephritis, fiery and high coloured, all sufficiently distinguish it from inflammation of the kidney. The stupor cruris, the rolling motion and retraction of the testicle of the affected side, &c. hinder its being confounded with colic. In lumbago also these symptoms are absent; nor is it attended with nausea and vomiting.

In no stage of this disease is it of so much importance to be accurate in the judgment we form, as where a stone is lodged in the bladder. Mistakes in this case have, at times, led to dangerous and even fatal practice. All the symptoms of a stone in that situation may be produced by morbid thickening and induration, or scirrhus of the coats or neck of the bladder. "So much are the symptoms of these two morbid affections blended," says Sherwin, "that I

believe the diseased and contracted bladder never fails to excite, for a great length of time, the strongest suspicion of stone, which nothing but the actual introduction of the finger per anum, or of the catheter into the cavity of the bladder, by one or more careful surgeons, can remove." Even the operation of sounding, if not done with great care and circumspection, and in many cases repeated, may lead to mistakes.

It may appear unpardonable carelessness to mistake, during a great length of time, a stone in the bladder for strictures of the urethra ; but such mistakes do happen. Along with Dr Monro, senior, I attended a case of this kind, in the course of last year. The patient, who came from a considerable distance, had been treated for two years upon the supposition of having strictures, without

any benefit to his complaints, and with much injury to his general health. The symptoms leading to a suspicion of stone in the bladder, I sounded him in presence of Dr Monro. The instrument went readily into the bladder, and at once discovered a stone, apparently of considerable size.

For the cure or alleviation of gravel and stone, many are the remedies which, in every age, have been recommended and used; the greater part of them harmless, many of them whimsical, and but very few which can be accounted of beneficial operation. The practice of the present day is almost exclusively confined to alkaline medicines. This useful class of remedies was introduced early in the last century, long before the real nature of urinary concretions was known, or suspected, and at a time when they were universally thought to be composed chiefly of alkaline or earthy substances. It appears probable, that their first application was directed solely to the correction and removal of superabundant acid in the stomach and in-

testines, which is so common during the presence of calculous complaints. The precipitation and concretion of the matter of calculus in the urinary passages, as already mentioned, is probably much influenced by this superabundant acid being absorbed into the circulation, and passing off in the urinary secretion. If so, the alleviation of the symptoms of gravel would speedily follow the use of alkalis, and thus establish their character.

The erroneous ideas entertained of the nature of urinary concretions, prior to the days of Scheele, when they were almost universally considered of an earthy or alkaline nature, seem, at times, to have given rise to most improper modes of treatment in this disease: thus, the constant use of acids, and of acescent diet, was once re-

commended for the cure of gravel. It is unnecessary to remark on the baneful effects likely to result from such a practice. But the accurate knowledge obtained of late years, concerning the real nature of these concretions, is of the greatest importance in guiding the medical treatment.

Alkaline medicines have maintained their reputation, more or less, ever since their first introduction into practice. Their utility in the disease of gravel is now universally admitted, although the extent of their power in curing the disorder is by no means agreed upon. However readily they act upon urinary concretions out of the body, few, if any practitioners of the present day, are sanguine enough to expect from their use the solution of a stone in the kidney or bladder. The great, and not unfre-

quently, the permanent relief obtained from long courses of Mrs Stephens's medicines, and of others of a similar nature, led at one time to a strong belief that this actually had happened in many cases, where dissection after death shewed the fallacy of the opinion, and obliged the favourers of these medicines to conclude, that their powers extended only to the prevention of fresh accretions of calculous matter, thereby allowing the surface of the stone to become smooth, and of consequence less irritating. Mrs Stephens's medicines, so long celebrated, were exhibited in three forms, a powder, a pill, and decoction; all of them composed of a nauseous disgusting jumble of calcined snail and egg shells, soap, swines cresses and honey, with wild carrot and burdock seeds, hips and haws, all burnt to blackness. As it became necessary, if benefit was expected from

these medicines, that the patient should use them for a great length of time, and take them in large quantities, almost every hour of the day, the disgust at them became in general so insuperable, that few comparatively had resolution to persevere in their employment. Dr Chittick's solvent, as it was called, is unquestionably a far preferable medicine. He took uncommon pains to conceal its nature, but it is known to be the caustic lixivium.

A very strong obstacle to the general and free use of all these medicines, arose from their great and nauseous acrimony, which no disguise was found to conceal. As a remedy less objectionable on this score, the mild alkalis, or alkaline carbonats, were recommended. Even these, to most people, are harsh and disgusting ; but of late years a method has been

employed of supersaturating alkaline solutions with carbonic acid, by which they are rendered palatable, and, if the process be properly conducted, even pleasant. The *aqua super-carbonatis potassæ*, better known under the name of *aerated alkaline water*, is familiar to most people afflicted with gravel. There is daily evidence of the essential relief obtained from these mild states of the alkalis; though it is contended by many, that when used in this neutralized form, they can have no more influence on urinary calculi than simple water, because their attraction for carbonic acid, with which they are completely saturated, is stronger than for the uric acid; and, therefore, the sole advantage arising from their employment is alleged to consist in their destroying redundant acid, and hindering its generation in the *primæ viæ*, on the absorption of which acid the separation

of the lithic matter in the urinary passage seems so much to depend. In this way, the free and constant use of these alkaline solutions, supersaturated with carbonic acid, will certainly be beneficial in all the different stages of calculus, where acid abounds in the stomach and intestines; they will, however, be more particularly useful in those cases where no stone of any size is formed, but where there occur, from time to time, discharges of sandy matter and small concretions, attended with those symptoms of irritation and uneasiness formerly described.

It may be proper here to mention a formula of mild alkali recommended by Dr Beddoes, which, from its cheapness, has the important advantage of being within reach of the poorest. His directions are to take soda in crystals, to

pound it coarsely, and expose it to a warm dry air, till it crumbles into a white powder. This powder is to be made into pills with soap, or any other cement, to which aromatics, extract of bark, &c. may be added. A quantity of soap, rather more than equal to the weight of the calcined alkali, is necessary to make it into pills: and of this powder, one or two scruples taken daily was found by Dr Beddoes of great efficacy, without being productive of uneasiness, or other unpleasant effect on the stomach.

But whatever benefit may result from the use of these mild alkalis, in certain cases, such as have been mentioned, there is no room to expect that they can have any influence as solvents of a stone already formed and lodged in the kidney or bladder. If we are to look for this

effect from alkalis, it must be when used in their caustic state. Caustic alkali, under various names, has, at different times, obtained great reputation as a solvent of stone. The most conspicuous of these was the medicine of Dr Chittick, which, as already observed, is ascertained to have been the caustic lixivium or soap-lye. The effect of this, at least in preventing the increase of a stone in the kidney or bladder, and thus allowing its surface to become smooth, may be inferred from the experiments of Blackrie; from which it appears, that the urine of those people who have taken this medicine for a length of time, becomes a very powerful menstruum of urinary concretions immersed in it.

The difference of success resulting from the employment of the caustic alkali, may probably, in a great mea-

sure, be accounted for from the very different nature of urinary calculi ; it being certain that this remedy can only act as a solvent, where a stone is formed of the uric acid, or urat of ammonia. But assuredly there is the greatest room to conclude, that many cases may occur where it may be administered with real benefit. Its acrimonious and disgusting taste may be a good deal covered by mucilages, milk, or any other soft diluting liquor, and by none perhaps better than what Dr Chittick himself used, veal broth. " Upon the whole," says Blackrie, " I am firmly persuaded, " that if patients were provident enough " to be attentive to the first approaches " of this cruel disorder, and to pursue " proper measures to prevent its increase, " by taking small quantities of lixivial " salts, and substances of which at present I know none so good and effectual

“ as soap-lye, in large quantities of soft
“ emolient diluting liquors, observing a
“ proper regimen, and repeating this
“ course occasionally, as symptoms indi-
“ cate, the future existence of such large
“ concretions would be entirely prevent-
“ ed.” He goes on to observe, that if
the disease be recent, and there be no-
thing but loose gravel, or if its concre-
tions be but small, small quantities of
this medicine, thirty or forty drops,
two or three times a-day, in half a
pint of weak veal broth, may be ad-
ministered ; and that this is to be per-
sisted in, so long as there is any appear-
ance of sabulous matter subsiding in the
urine, or continuing to furr the pot; and
that such a course ought to be renewed
from time to time. He also suggests,
that if, after a severe nephritic fit, there
be reason to suspect a small stone to have
dropt into the bladder, a large quantity

may be given to promote its solution and expulsion as soon as possible. He says, “ A tea-spoonful, or even two, “ twice or thrice a-day, cannot, I think, “ be too much ; the dose, however, as “ I before observed, ought to be regulated, and made more or less, according to its effects. By this prudent “ management, I know a person who, “ by degrees, was enabled to take an “ ounce of very strong soap-lye every “ day, for a great length of time, with “ good effect to the complaint, and no “ ill consequence to his general health.” He adds, “ If calculous concretions are “ become so large, compact and hard, “ that a total solution of them cannot be “ expected, our business then is to augment the dose of these substances by “ slow degrees, by which means I doubt “ not, that not only new accretions or “ layers will be prevented, but likewise

“ the rough surfaces of those already
“ formed, speedily rendered smooth ;
“ hence a permanency of ease will be
“ obtained, which persons in these cir-
“ cumstances were before unacquainted
“ with.”

From the foregoing remarks and quotations, then, there seems reason to suspect that this medicine, the caustic alkali or soap-lye, however objectionable in some respects, has fallen into unmerited disuse, since the introduction of alkaline carbonats. In certain stages of the disease to be presently mentioned, a due and steady perseverance in its employment may be really beneficial, where the milder forms of the alkalis will, comparatively, have little effect.

Before quitting the subject of solvents, it may be proper to mention lime water,

which long maintained a high reputation in the cure of gravel and stone. Any good effects arising from its use, seem entirely to depend upon its alkaline properties, correcting acidity in the stomach and intestines, which however is more effectually accomplished by the alkaline carbonats.

IN every stage of gravel and stone, due and constant regard to the general health and functions of the body will be found of very great service in mitigating the severity of the complaint. The state of the stomach and intestines, in particular, will require to be attended to. Their functions are invariably more or less impaired in this disease; and there is good reason for concluding, that the

beneficial effects of certain medicines, in alleviating the symptoms of calculus, are to be ascribed solely to their operation on the stomach and intestines, correcting and destroying superabundant acid ; on the absorption of which into the system, as already observed, it is more than probable that the precipitation of uric acid, in other words, the production of gravel, very much depends. Almost every attack of gravel is attended with loss of appetite, indigestion, flatulence, and costiveness ; and much may be done towards obviating this morbid condition of the functions of the stomach and intestines, by a proper regulation of diet. Where the circumstances of the patient admit, every article of food ought to be rejected which experience has proved to be of difficult digestion. Animal food of various kinds, dressed in the simplest manner, will in general

be found to be the best ; and all ascescent vegetable diet should, if possible, be shunned. Dr Chittick seems to have been well aware of the importance of attention to this point ; and to the strict rules laid down by him during the use of his celebrated solvent, the great relief so often obtained is, in a considerable degree, to be ascribed. He prohibited all acids and every thing having a tendency to acidity ; such as wine, beer, cyder, perry, and other fermented liquors, allowing only the use of a weak beverage of brandy and water ; directing the diet to consist of beef, mutton, lamb, veal, and poultry of every kind.

Where exercise is admissable, it will assist much in restoring and preserving a proper tone of the stomach and intestines. In most stages of gravel, exercise, however, must be used with much pru-

dence ; and, in certain states of the disease, even the gentlest will occasion irritation and distress.

In this disordered state of the stomach and intestines, recourse is had to the aid of medicines with the best effects. Gentle emetics may be exhibited occasionally, if need be. For the removal of costiveness, which is very common and distressing, a variety of laxatives may be employed according to circumstances ; such as castor oil, the aloetic and stomachic pill of the Edinburgh Pharmacopœia, rhubarb, magnesia, &c. In general, nothing will be found better for this purpose than a proper mixture of rhubarb and well calcined magnesia, with an aromatic, such as ginger ; and this medicine should be frequently exhibited.

For the immediate removal of acidity, at all times so distressing in this disease, nothing is so effectual as the alkaline carbonats. Few people labouring under gravel are ignorant of the aerated alkaline water. When well prepared, it is rather agreeable to the taste, and many so afflicted use it habitually. But the trouble and expence of preparing it, put it beyond the reach of indigent sufferers: effects equally beneficial, however, may be derived from the employment of the alkaline pill formerly mentioned, as recommended by Dr Beddoes, which may be said to cost only the trouble of making. The same may be said of lime water, which is very effectual in removing acidity.

For restoring the tone of the stomach, bitters are very generally had recourse to, and often with much advantage;

but their constant, or long continued use, is much condemned. Of this class of medicines, colombo ranks as one of the best. It may be exhibited either alone, or in conjunction with rhubarb, with the best effects. The following formula I have used with the greatest advantage in such cases :

R	Pulv. Colomb.	-	3 vi.
	Carbonat Potassæ puriss.		3 fs.
	Pulv. Rhei.	- -	3 ii.

Of this powder a tea-spoonfull may be taken twice a-day, in a sufficient quantity of water. It should be kept in a phial well corked, as the alkali readily attracts moisture from the atmosphere. For the same purposes chalybeate medicines are in daily use, and their influence in restoring tone to the stomach, when debilitated, is frequently very powerful. They are exhibited either alone, or in combination with other

remedies, chiefly with bitters. A pill formed of two parts of extract of cinchona, and one part of the sulphas ferri, and of the pulvis myrrhæ, is a valuable tonic medicine. Mr Forbes recommends a pill formed of the sulphas ferri, alkali, and gum myrrh, as excellent in this state of the stomach.

AFTER these general remarks on the treatment of gravel, a few observations will be necessary as to the application of the means of relief, or of cure, in its different stages.

The most frequent, and fortunately the least formidable state of the complaint is, where from time to time, in some cases almost constantly, loose sand, as it is called, or small granulations are discharged. This may continue long without concretions being produced of such a size as to occasion much trouble or irritation in their passage through the ureters or urethra. This condition may be considered as constitutional, and therefore not to be eradicated; the treatment, accordingly, must be directed

to the mitigation of symptoms, and to the preservation of the general health, so that we may guard against the formation of more formidable concretions. These objects are most likely to be attained by strict attention to those rules already laid down in respect to diet, and to every other means for preserving a healthy state of the functions of the stomach and intestines. Every irregularity, or whatever is known to bring on these attacks of gravel, should be carefully shunned. When much irritation occurs during any attack, opiates by the mouth, or opiate injections, will give much relief. A plentiful use of mild mucilaginous diluents will also be very serviceable. In such attacks, the almost immediate ease obtained from alkaline medicines is well known, and, as already remarked, is to be accounted for from their immediate action on the acidity of the stomach and intestines. In

these cases, then, the alkaline carbonats, lime water, the alkaline pill of Dr Beddoes, or any other mild form of alkali, ought to be had recourse to from time to time, according to the frequency and urgency of the attacks. Many people constitutionally liable to gravel, as before stated, are in the daily use of the aerated alkaline water, with the very best effects.

A stone formed and lodged in the pelvis of the kidney, having acquired such a size that it cannot pass through the ureter, is a rare occurrence, but where it does happen, it constitutes a disease, for the most part, of the most melancholy and helpless kind. So desperate have such cases been considered, that at different times it has been proposed to attempt the extraction of the stone, by an incision made into the body of the kidney, from the back. There

is more than one case on record, where such an operation has been performed with success; but as the symptoms indicating a stone in this situation, are by no means infallible, it is scarcely possible to conceive a case where the suggestion of such a method of cure would be warranted. It is in this stage of gravel that there appears most room for the free employment of the caustic lixivium.

From the observations which have been already stated, of Fourcroy and others, it would seem, that the greater number of concretions which form in the kidney, are composed principally of uric acid: and it has been mentioned, that the alkaline carbonats can only be beneficial in such cases, by destroying acidity in the *primæ viæ*, and thus probably retarding the increase of the stone already formed. But from those facts

formerly quoted, there is reason to expect much good from a steady perseverance in the use of the caustic lixivium or soap-lye, exhibited in the manner which has been directed. It can scarcely be hoped that a complete solution of the stone will take place from the most lengthened course of this medicine, but such a partial degree of it may be expected, as will render the surfaces smooth, and of course less irritating. Mr Fourcroy goes so far as to express his belief, that the internal use of the caustic alkali, will reduce small stones of the kidney, cure sand, and hinder the augmentation of calculi formed of uric acid. The principal objection to this remedy is its great acrimony, which, with some people, nothing can obviate; it may therefore be resorted to occasionally only, according to the urgency of the complaint; and may be alternated with the alkaline car-

bonats. But in this stage of the disorder, it is of the utmost consequence to prevent any increase of size in the concretion already formed; and therefore the continued use of some form of alkali, will be highly advantageous. The caustic lixivium, as being prepared at little expence, is a medicine well suited to the condition of the poor, who labour under this disease.

Constant and strict attention to the state of general health, especially to the functions of the stomach and intestines, will likewise be particularly beneficial in this stage of gravel. But, where there is room to suspect that a stone of considerable size is lodged in the pelvis of the kidney, exercise is a doubtful remedy, must be of the gentlest kind, and used with the greatest caution.

When, in the progress of the disease, inflammation, suppuration, or scirrhus come on, ending in hectic fever, very little can be expected from the power of medicine: all that can be done is to relieve urgent symptoms as they occur, support the strength by light nourishing diet, and guard against the attacks of pain, by rest, and the free use of opiates.

When a stone is obstructed in its passage through the ureter, from the kidney to the bladder, the chief and immediate attention is to be directed to the employment of such means as will promote its expulsion. For this purpose, those remedies are to be applied which are best calculated to obviate spasm in the ureter, and to prevent the supervening of inflammation, from the obstinacy of the obstruction. Where the patient is robust and plethoric, blood-letting may

be freely and advantageously used ; and leeches applied to the immediate neighbourhood of the parts affected, followed by fomentations, will frequently be attended with the best effects. Gentle laxatives, such as the neutral salts, castor oil, and emolient injections, will be found very beneficial. Nausea and vomiting, when very severe, may be relieved by administering effervescing draughts. But for the removal of that spasm which chiefly retards the descent of the stone, no means are so effectual as the very free use of opium, and the warm bath. The former should be given in large doses, especially after previous evacuations ; and probably the most beneficial form of applying this medicine, is to exhibit it frequently by injection, particularly if the stomach be much harassed with nausea and vomiting.

A due perseverance in these means will generally prove successful. But if the obstruction continue obstinate, and the danger of inflammation increase, the evacuation of blood must be more freely had recourse to, and blisters may be applied as nearly as possible to the parts affected.

During this stage of the disease, it is necessary to desist entirely from the use of alkaline medicines. The diet should be of the lightest kind, and mucilaginous diluents, as barley water, in very moderate quantities, will be proper.

By persisting diligently in this plan of treatment, the obstruction for the most part, sooner or later gives way, and the patient gets immediate ease. When a stone has thus dropt into the bladder, the attention ought to be immediately

and anxiously directed to promote its expulsion through the urethra. The patient must be directed to favour this as much as possible, by the plentiful use of diluents, and he ought to be careful to ascertain if the concretion really do pass off. If it do not, there is every reason to apprehend its increase in the bladder.

The improved state of modern surgery has divested the operation of lithotomy of many of its terrors, yet it is always formidable, and never free from danger. It will probably never be either proposed or submitted to, until the stone has acquired such a bulk in the bladder as to induce those symptoms of irritation and distress which have been already enumerated. Until these take place, therefore, the diligent use of alkaline medicines, particularly of the caustic lixivium, should be persisted in. By the

free employment of this remedy, before a stone has acquired any considerable bulk, some chance may be given of its still being discharged through the urethra.

The accurate knowledge of the nature of urinary concretions, resulting from numerous experiments, suggested to Mr Fourcroy a mode of attempting the solution of a stone in the bladder, by means of injections through the urethra. Such a method of treatment had been formerly recommended and even practised, but at a time when the real nature of these concretions was generally unknown, and when of course there could be little to guide the choice to the proper solvent. Fourcroy found that the lixive of pure potash or soda, diffused in water, so as to be easily suffered in the mouth, and even to be swallow-

ed, softens, breaks down, and dissolves, in a few days, small calculi, or fragments of large ones, composed of uric acid, or urat of ammonia, which are kept plunged or suspended in the solution by a thread. The nitric, or muriatic acids, as weak as simple lemonade, and scarcely more acrid than the urine itself, soften and dissolve still more quickly concretions formed of the phosphat of lime, and of magnesia and ammonia. The moriform calculi proved to him most difficult of solution. Nitric acid diffused in water, in time dissolves them almost entirely, except the animal matter; and solutions of the alkaline carbonats have the same effect.

According to the nature of the stone to be dissolved, Fourcroy proposes to inject into the bladder one or other of these liquids. He states three objections

arising to their use: 1st, The difficulty of ascertaining the nature of the concretion in the bladder; 2dly, The necessity of taking care that there be no action of the solvent on the bladder; and, 3dly, The mixture of the solvent with the urine, which may alter its effects. The first objection, he thinks, may be obviated, in some measure, by examining the urine. If there be an absence of uric acid, we may conclude that it goes to the formation of the calculus; and, upon the whole, as the uric acid, and urat of ammonia, are the most frequent constituents of urinary concretions, there will be oftenest room for choosing alkaline lixives.

Having injected a lixive of potash, of proper strength, and allowed it to remain for half an hour or more in the bladder, it is evacuated and filtered

through paper ; to this is added a little muriatic acid, and, if the lixive has met with a stone composed of uric acid, and has begun to dissolve it, a white precipitate will be sensible. If the alkaline lixive, when discharged from the bladder, and subjected to this test, gives no indication of uric acid, after a trial of several days, and the symptoms remain obstinate, there will be then reason to suppose that the stone is not composed of uric acid ; and the next trial may be with the weakened muriatic acid. This having been allowed to remain a due time in the bladder, some drops of a solution of ammonia, or potash, are to be added to it, after it is discharged, and a precipitate of phosphat of lime, or of magnesia and ammonia, will take place, if the stone be formed of these substances. Of all calculous matter, the earthy phos-

phats are most readily dissolved in muriatic acid. If a precipitate ceases to take place by the addition of ammonia or potash, there is reason to suppose the nucleus to be uric acid, or urat of ammonia, and then recourse must be had to injections of lixive of potash.

The second objection is readily obviated by attention to the due strength of the liquor to be injected. The alkaline, or muriatic solutions, should be made so weak as to have no more sensible acrimony than the urine; and Fourcroy has seen these solutions, so diluted, used in different cases, without producing pain, irritation, or inconvenience. He has observed, that the accidulous, or diluted muriatic injection, although as weak as lemonade, is always more sensibly felt by the bladder than the alkaline solutions, and excites inclination to make

water, irritation, and uneasiness ; but happily this acid, reduced to a very great weakness, dissolves readily the calcareous phosphats ; and it is not necessary that it should remain so long in the bladder as the alkaline solutions, whose action on the uric acid is more slow and difficult.

The third objection, namely, the influence of the urine, by mixing with the solution, and weakening or destroying its effects, he directs to be obviated by evacuating the urine, washing the bladder out with warm water, and giving the patient in his drinks weak solutions of caustic alkali. We know, he observes, from experience, that after the internal use of pure alkali, the urine ceases to be acid, becomes alkaline, and takes a character analogous to the injection ; and he expresses his belief, as formerly stated,

that the internal use of alkalis may reduce small stones of the kidney, cure sand, and hinder the augmentation of calculi of uric acid.

Fourcroy directs these injections to be used at the heat of 25 degrees of Reaumur, (about 88 of Fahrenheit) and to be thrown into the bladder by means of an elastic gum catheter and a tin syringe. They are to be used at first three or four times a-day, then six or eight times, and are to be retained each time from a quarter of an hour to an hour. In this way their use is to be continued for months. He advises the elastic gum catheter to be kept in the bladder, and the patient to be accustomed to throw in the injections himself, thus avoiding the irritation of frequent introduction, and becoming familiar with an operation neither difficult nor painful. He

recommends the passing some tepid water into the bladder after each injection ; and concludes, by saying, that a stone, which has been many years in forming, will take a long time to be dissolved by the use of injections ; that the hope of avoiding so terrible an operation as lithotomy, should give the necessary patience for such a trial, and that success is only to be looked for from a perseverance, which, unhappily, few are found to possess.

Such is the method recommended by Mr Fourcroy of dissolving calculi in the bladder, by which the painful and dangerous operation of lithotomy may be avoided. But in the present improved state of surgery, this operation, although never without risk, is less to be dreaded than formerly ; and, every circumstance kept in view, will probably be advised,

in the very great majority of cases, as the most eligible mode of treatment. Should the use of injections ultimately prove unsuccessful, the chance of recovery from the operation of lithotomy, when resorted to, may be diminished by the consequent delay ; and also by a state of irritation and disease being perhaps induced in the coats of the bladder and neighbouring parts. Yet, certainly, the measure is worthy of every attention, and cases may occasionally occur where these injections may be employed with much propriety. Many people afflicted with stone in the bladder, from insuperable timidity, or from other causes, obstinately resist every proposal for an operation ; in such cases, injections into the bladder, in the manner recommended, may be had recourse to with much chance of benefit.

Stone in the bladder is a rare occurrence in females. Concretions formed in the kidneys, and passed through the ureters, are readily discharged through the female urethra, the diameter of which is considerable, and its course short. When a stone has acquired such a bulk that it cannot be discharged, it may be removed by the operation of lithotomy, which in them is much less hazardous than in men. But it may happen, that many women so afflicted will suffer long before they can submit to an operation so formidable in its nature, and so shocking to female delicacy. In such cases, the employment of injections may be recommended. They can be used much more easily in women, and are less likely to induce irritation or disease in the parts connected with the bladder.

CHAP. II.

OF DISEASE OF THE COATS OF THE
BLADDER.

THE urinary bladder, especially in the decline of life, is very liable to attacks of disease. The symptoms accompanying every morbid affection of this viscus are always more or less harassing, and their removal often beyond the power of medicine.

A thickening, induration, and contraction of its coats, often attended with inflammation, and sometimes ending in ulceration, scirrhus, or cancer, are by no means unfrequent. This morbid con-

dition of the bladder takes place in different degrees of severity, and proceeds from different causes. In general, it will be found to arise from the constant irritation and inflammation excited by the presence of other diseases affecting the parts contiguous to and connected with it, such as strictures of the urethra, swelling and induration of the prostate gland, scirrhus and cancer of the rectum or uterus, stone in the cavity of the bladder, or great disease of the kidneys. It may also be induced by repeated attacks of inflammation, brought on by great and habitual intemperance, by exposure to wet and cold, the very imprudent use of irritating injections for the cure of gonorrhæa, accidents, &c. independently of any morbid affection of the surrounding parts; and whenever the coats of the bladder have, in this way, been exposed to such a state of inflammation, very

trifling causes will excite a renewal of its attacks.

In old age, the powers of the bladder are very apt to fail, and its coats to fall into a state of thickening and contraction; in this case however, the complaint, which is brought on by no apparent exciting cause, but is seemingly connected with a state of general debility of the system, will be found, for the most part, unaccompanied with any symptoms of inflammation and irritation; therefore persons thus affected suffer nothing from pain, and feel no other inconvenience than what arises from the frequent necessity of evacuating the urine, which, as the disease advances, at last terminates in complete incontinence; the bladder being now in that state of contraction, according to Mr Sherwin's observation, as to be little

more than an additional pelvis common to both kidneys.

When disease in the coats of the bladder is accompanied with inflammation and irritation, all the symptoms bear the strongest resemblance to those excited by stone or gravel, and, for some time at least, are very generally supposed to proceed from these diseases. The same pain, irritation, and frequency of desire to evacuate urine, take place; and the presence of spasm may, at times, give the same interruption to its flow, as the pressure of a stone upon the beginning of the urethra. It is, therefore, as formerly remarked, of much importance to obtain, where these diseases do occur, an early and correct knowledge of their real nature, as this will be found highly necessary for their proper treatment.

In discriminating this diseased state of the coats of the bladder, from other affections similar to it in their symptoms, Mr Foote considers the following circumstance as the most unequivocal, that the bladder thus diseased, is not capable of containing beyond one invariable, precise quantity, and that the quantities discharged, at different times, are very nearly equal. If, therefore, the quantity discharged does not vary, but is uniform, for a length of time, he concludes the disease to be a thickening and contraction of the coats of the bladder. Perhaps, however, the operation of sounding, if a sound can be passed into the bladder, is most to be depended upon for obtaining a just knowledge of the state of the disease. However, even this is not to be trusted to implicitly, and should be employed with the greatest care and attention. Every surgeon of

experience knows, that a stone may be so situated in the bladder as not to be discovered even by repeated sounding; and there cannot be a doubt, that the sensation communicated through the instrument, from induration of the neck and coats of the bladder, has occasionally been supposed to proceed from a calculus, and that this mistake has led to the most distressing, and even fatal treatment. By particular attention, however, in tracing the progress of the symptoms, joined to a careful, and, if necessary, repeated introduction of the sound, and examination with the finger in ano, the real nature and state of the disease will, in general, be pretty accurately ascertained.

But it is with strictures of the urethra, perhaps, that this morbid state of the bladder is most frequently found con-

nected. This disease of the bladder, from whatever cause it originates, after long continuance, seldom fails to induce obstructions of the urethra, in consequence of the irritation and spasm being constantly communicated through this canal; at the same time it must be observed, that strictures are much more commonly a cause than a consequence of induration and thickening of the coats of the bladder. When these obstructions are very considerable, and have continued for some length of time, they almost invariably come to be attended with attacks of inflammation, irritation, and spasm, which are readily communicated to the bladder: it then becomes impatient of distension; frequent and painful efforts to evacuate its contents take place, and, unless the obstruction of the urethra be removed, the process of contraction in the coats will go on, and

the cavity of the bladder will, of course, gradually become smaller.

In this state of disease, complete suppression of urine frequently takes place, with all the distress usually attending this condition, requiring the employment of those remedies necessary for removing it, even to the introduction of the catheter, although the bladder may not perhaps contain more than two or three ounces of urine.

When morbid thickening and contraction of the coats of the bladder, and strictures of the urethra, are found combined in the same case, it will be highly proper to ascertain, if possible, which is the primary affection, before any judgment can well be formed as to the probability of a cure. This can only be

done by a careful investigation of all the symptoms through their whole progress.

The symptoms of thickening and contraction of the coats of the bladder, will be more or less urgent, according to the exciting cause. Where the disease occurs in that mild form which is met with in advanced age, depending chiefly, as already noticed, on a state of general debility of the system, it is very seldom attended with inflammation, or any symptoms of uneasiness, and the person suffers no inconvenience but from incontinence of urine. It is far otherwise, however, where the complaint is accompanied by inflammation. In this case, the inflammatory disposition continuing, the most trifling causes excite a recurrence of the attacks, in consequence of which the bladder becomes more and more impatient of distension; the irri-

tation and desire to evacuate its contents are constant and painful; the urine is loaded with mucus, has very often an offensive ammoniacal smell, and, upon standing, very soon becomes putrid.

Under such circumstances, if no sufficient means be employed to obviate the effects of the disorder, it is evident that the general health must suffer. The strength and spirits are impaired by the frequent attacks of pain, fever, loss of appetite, and want of sleep. As the disease advances, all its symptoms become more urgent and intolerable. The repeated attacks of inflammation frequently induce a state of ulceration, and even of scirrhus and cancer: purulent matter, at times mixed with blood, is discharged along with the urine; a constant burning pain is felt in the region of the bladder; an almost unceasing stranguary

takes place ; the relief from very large doses of opiates is but slight and transient. All the symptoms of hectic fever come on ; the patient becomes emaciated ; his strength and spirits are quite worn out, and, under this accumulation of the greatest sufferings, he dies quite exhausted.

Such is too often the progress of this melancholy disease ; nor does it appear that the powers of medicine or surgery can do much in arresting its course, when completely formed, and far advanced, unless where it has been excited by causes which may be removed, as stone in the bladder, or strictures of the urethra.

It may be difficult to guess at the precise state of disease in the coats of the bladder, when affected in the manner

just described. Cases sometimes occur, where the symptoms of distress have been of long standing and very urgent, the disease in the end proving fatal, by gradually exhausting the patient's strength; and yet, upon dissection after death, there appears no morbid condition of the parts corresponding with the state of suffering during life.

Dr Baillie thinks, that the muscular coat, when simply thickened and indurated, has been sometimes mistaken for scirrhus. Such thickening, induration, and contraction of the muscular coat of the bladder, sometimes take place to a great degree, and yet readily disappear upon the exciting cause being removed. Examples of this occur every day, in the removal of stone and strictures. Dr Baillie is of opinion, that scirrhus and cancer do not often attack the bladder

itself in the first instance, but that in certain cases it partakes of these diseases, from its contiguity to parts which are very liable to these affections. Thus the disease, on some occasions, spreads from the rectum ; in others, from the uterus ; and in either case, the bladder becomes very thick and hard. Some time ago, I met with a case of this kind in a young woman, where scirrhus and cancer of the uterus were communicated to the bladder ; the urine flowed perpetually through the vagina ; the sufferings were terrible, and not to be alleviated by any medicines.

The great quantity of matter, evidently purulent, so often discharged along with the urine in a diseased state of the bladder, has led to the common belief of the existence of circumscribed ulcers in its substance. Such have certainly

been found ; but the usual source of this purulent discharge appears to be the internal or villous coat, which, like other secreting surfaces, when in a state of inflammation, pours out purulent matter in considerable quantity.

BESIDE these morbid affections of the urinary bladder, the circumstances attending which are detailed above, it is subject to a disease, in some respects similar, though in others widely different, described by Dr Gilchrist in the Edinburgh Physical Essays. In this disorder, he says, “ there is no contraction
“ or diminution of its capacity ; on the
“ contrary, the whole bladder suffers an

“ uniform thickening in all its coats, or
“ such an increase of its substance, as
“ seems peculiar to membranous parts.”

In enumerating several cases of this disease, it appears from the history of these to have been always preceded by suppression of urine or stranguary, and symptoms of inflammation about the neck of the bladder. When the symptoms gave way, “ a difficulty of urining
“ commonly remained, and a tumor was
“ formed in the lower part of the belly,
“ under the recti and pyramidal muscles,
“ in one case about the size of a man’s
“ fist, without pain ; in another, where
“ there was frequent inclination to make
“ water, and which the patient made in
“ large quantity, and of a greenish colour, the bladder was so tumified as
“ scarcely to be comprehended by a full
“ grasp of the hand, rising as high as
“ the navel, and feeling of a firm, fleshy

“ consistence about the neck and fun-
“ dus, the whole of it exquisitely pain-
“ ful.” Upon examining this latter case
after death, “ about half an English pint
“ of urine was found in the bladder,
“ which lay quite flaccid, not embra-
“ cing its contents, and might have
“ contained thrice that quantity. It
“ had a perfect coriaceous appearance,
“ like that of raw hides steeped in wa-
“ ter, white, smooth, and shining; was
“ near one-fourth of an inch thick, and
“ remarkably firm. The neck of the
“ bladder was scirrhus, almost cartila-
“ ginous, forming a pretty large oblong,
“ uniform tumour.”

In this particular disease of the blad-
der, where its coats were thickened, and
in a state of slow inflammation, Dr Gil-
christ found a mercurial course most ef-

fectual in producing a cure, employing as occasion required, in the first attack of the disease, blood-letting and other means. In general, he found the warm bath prejudicial.

Where the coats of the bladder have
been once excited severely by inflammation, every trifling cause, as before observed, will tend to excite a renewal of the disease. DAILY observation teaches, that contraction in the coats of the bladder, brought on by the long continued irritation of stone, readily and quickly goes off, upon the exciting cause being removed by the operation of lithotomy. The same remark will apply where the disease has been excited by strictures of the urethra.

Where it does not arise from any such cause, but is induced by inflammation, the consequence of habitual hard drinking, and other intemperance, too long retention of urine, or similar causes, the chance of effecting a cure is much more uncertain.

Where the coats of the bladder have been once attacked severely by inflammation, very trifling causes, as before observed, will readily excite a renewal of the attacks, by which the process of thickening and contraction, once induced, is gradually accelerated. Therefore, during the first approaches to this morbid state, it will be of great importance to adopt such a plan of treatment as will be most likely to obviate the disposition to inflammation, thereby allowing the parts affected to recover a more healthy condition. For these purposes, every kind of excess or irregularity ought most carefully to be shunned. The diet should be of the least irritating nature possible. All fermented liquors should be prohibited, and mild mucilaginous drinks, with decoctions of sarsaparilla ought to be recommended. The bowels should be

kept regularly open by gentle laxatives, such as castor oil, the neutral salts, or emollient injections. Although it is sometimes adviseable to resist the frequency of desire for evacuating the urine, this should always be done with the greatest caution; and every situation should be most carefully avoided, where, from motives of delicacy, or otherwise, a danger of too long retention arises, which will certainly, at all times, be productive of the very worst consequences.

Where spasmodic irritation is so frequent and distressing, as it is commonly found to be in this state of disease, no medicines are so beneficial as opiates. Tincture of opium should be administered freely for removing this most troublesome symptom, and repeated frequently, according to its urgency; care being always taken to obviate its astringent ef-

fects by the use of gentle laxatives or emollient injections. In this morbid condition of the bladder, the most efficacious method of exhibiting opium seems to be in the form of injection. In this way, sixty, eighty, or a greater number of drops of tincture of opium, according to the urgency of symptoms, mixed with four ounces of mucilage of gum arabic, or thin starch, with a table-spoonful of olive oil, may be administered once or twice a-day ; or opium, in substance, may be introduced into the rectum by means of a bougie with advantage ; and, if I am not misinformed, is used in this way by Mr Home and Mr Cline, in preference to any other form.

A material objection occurs to the constant or very frequent use of opium in large doses, from its effects in injur-

ing the functions of the stomach and intestines. As a substitute supposed to be free from such inconveniences, the extract of hyoscyamus has been often recommended, and employed in this, and similar affections. This medicine, when well prepared, unquestionably possesses considerable anodyne virtues, and has the advantage over opium, of operating as a gentle laxative. When it is considered adviseable to employ this remedy, it should be given at first in doses of five or six grains, gradually increasing the quantity, according to the state of distress, and the effects produced by the medicine. Continued for a length of time in this way, it may, by degrees, be taken in very considerable doses. It may be proper, however, to remark, that the preparation of this extract does not appear to be conducted with such uni-

form precision as that of opium, because different parcels of it are found to possess the anodyne virtue in different degrees. This circumstance should be particularly remembered when a fresh parcel of the medicine is employed, after the dose has been increased to a considerable extent, taking care to lessen the quantity at first, until its effects are known. From want of attention to this fact, disagreeable and embarrassing symptoms have sometimes been produced.

As a remedy for the removal of spasm and spasmodic irritation, fomentations, and still more the warm bath, will be found particularly serviceable.

From a steady and persevering employment of these means during the early stages of this painful disease, it is probable that much advantage will accrue ;

the spasmodic irritability, and disposition to inflammation may subside, and the coats of the bladder may, in time, resume a healthy state of action. But where the disorder is far advanced, and the morbid parts have run into a state of ulceration or scirrhusity, the case becomes very hopeless: indeed, in this miserable stage of the disease, it is to be feared that all we can in general look for from the power of medicine, is temporary and very transient relief from pain, and alleviation of the other symptoms of distress. For attaining these ends, a more diligent employment of the means already mentioned, becomes necessary. As the pain and irritation are now particularly distressing, the constant and large use of opiates, especially of opiate injections, with the warm bath, will be found almost indispensable.

Other remedies, of inferior note, may also be here mentioned. The constant state of irritation attending this morbid condition of the bladder, disposes strongly to that particular action of the kidneys producing an increased separation of uric acid in the secretion of urine; in other words, occasions gravel, the irritation excited by which adds to the general distress. For removing a symptom so troublesome, nothing answers better than the employment of some of the milder forms of alkaline medicines, such as the aqua super-carbonatis potassæ, (the aerated alkaline water). Lime water is a remedy well adapted to a state of gravel connected with diseased bladder.

The medical virtues of hemlock do not rank so high as they once did, yet many practitioners think favourably of

its use in this and similar disorders. As this diseased condition of the bladder is supposed to be sometimes connected with a state of scrophula, it may, in such cases, perhaps, be of considerable service. If benefit be expected from it, it should be used in as large doses as possible, and, in this way at least, its narcotic virtues may be useful in alleviating pain, if it should be attended with no other good effect.

Gentle courses of mercury, conjoined with hemlock, have sometimes been supposed beneficial; but mercury appears to be an equivocal remedy in this disease. It has been already stated, that in that particular affection of the bladder, treated of by Dr Gilchrist in the Edinburgh Physical Essays, where a state of slow inflammation was present, mercury was the only remedy trusted to

by him for a cure. But where the morbid condition of the bladder is such as that at present under consideration, where the inflammation and irritation are great, verging to a state of ulceration or of scirrhus, mercury has been supposed to be injurious. In a case of this kind, which fell under my own observation some time ago, I have reason to think that all the symptoms of distress were hurried on to a fatal termination by a gentle mercurial course. Therefore a medicine so active, should, at all times, be employed with much caution in this disease.

In ulcerations of the urinary passages, the different turpentine medicines have always been considered beneficial. Their exhibition is quite safe, and, as they may sometimes prove serviceable, they are worthy at all times of a trial. The bal-

samum copaibæ is nearly allied to the turpentine, and is one of the best medicines of the kind in these affections.

The *arbutus uva ursi* was long celebrated for the same healing virtues in ulcerations of the urinary passages, but it seems now to have fallen into unmerited disuse. So highly was it esteemed by De Haen, that he considered it almost a specific in ulcerations of the urinary passages. He even believed it to possess a solvent power in stone; and although there be good reason to think that it really has no such virtues, yet the relief resulting from its use in stone, and other diseases of the urinary passages, having led De Haen to esteem it so highly, is a pretty strong proof of its utility and value. Where the stomach is delicate and weak, and it generally is

so in these diseases, the size of the dose, when given in substance, being from half a drachm to a drachm, is apt to excite loathing and insuperable disgust. When this happens, it may be given in a strong decoction.

One of the most troublesome circumstances in this disease, and which frequently occurs, is a total suppression of urine. For the removal of this symptom, opiates taken into the stomach, opiate injections, gentle laxatives, laxative injections, fomentations, and the warm bath, are employed. The passing of a bougie sometimes speedily relieves the spasm, and brings on a discharge of urine. If these means fail, we must introduce the catheter, although the cavity of the bladder may not contain above an ounce or two of fluid.

Where that mild form of thickening and contraction of the coats of the bladder, which takes place in advanced age, is met with, it will seldom happen that much more is in the power of the surgeon than a recommendation of constant employment of the urinal. If early attended to, however, it may in some measure be useful to resist the frequency of call to empty the bladder; but this must be done with much prudence. That debility of the system, upon which we are led to believe the complaint chiefly depends, will be best counteracted by nourishing diet, cold bathing, regular gentle exercise, and tonic medicines, particularly chalybeates. In such an atonic state of the bladder, small doses of cantharides have been recommended by some practitioners, and said to be often beneficial. Of this medicine, in such cases, I have had no experience. It is

a remedy which ought at all times to be used with great caution.

IN the treatment of a disease, so very distressing as the one at present under consideration, every probable means of alleviation or of cure is worthy of attention. From what has been already stated, it appears, that excepting temporary relief from pain, and other urgent symptoms, little is to be expected from medical aid in the advanced state of this complaint, especially where ulceration or scirrhus, attended with hectic fever, has taken place. But in its more early stages, or where it occurs under a milder form, there is room to look for a very great degree of amendment of symptoms, if not for a cure, by injecting

mild fluids into the bladder, so as gradually to distend its coats, in the manner recommended by Mr Foote. It appears that Mr Foote was first led to adopt this practice from its having been successfully followed by Le Dran in one case ; and his experience of the efficacy of the mode, in several instances of the disease, seems to warrant the confident manner in which he recommends his method of treatment to public attention.

Where it may be conceived adviseable to try this plan of cure, the first thing to be done is to dilate sufficiently, or to destroy any stricture which may be present in the urethra ; so as to admit a flexible or elastic gum catheter, through which any mild fluid is to be injected from an elastic gum bottle fitted to this catheter. In general, Mr Foote appears to have found it an easy matter to ac-

comply with this, and his patients were soon able to do it themselves. It is surprising, according to his statement, in how short a time the bladder was dilated in this manner. From not being able to contain an ounce or two of urine, his patients could readily retain ten or twelve ounces in the space of two or three weeks; and the very frequent calls to pass urine, with the other symptoms of irritation, were removed at the same time.

Taking for granted, that the facts detailed in favour of this practice, by Mr Foote, are accurately stated, such a method of treatment is certainly deserving of attention. But it must be observed, that probably the great benefit experienced in those cases, so treated by Mr Foote, may be ascribed to the previous removal of strictures in the urethra, which appear to have been present, and

which may be supposed to have induced the irritable and contracted state of the bladder.

Objections arose formerly to this mode of treatment, from the difficulty and risk attending the frequent introduction of the common metallic catheters; but Mr Foote considers these to be obviated by the employment of one made of the elastic gum.

The above method of cure seems to be particularly well adapted to that state of contraction and thickening of the bladder, which is brought on by stone or strictures, and which has not gone off upon the removal of the original exciting cause. In such cases, it may certainly be used with every prospect of advantage.

CHAP. III.

OF DISEASE OF THE PROSTATE GLAND.

CONSIDERING how very frequently this gland must be exposed to great and constant irritation, from morbid affections in parts connected with it, such as strictures, stone, &c. it is rather surprising that it is not oftener found in a state of disease. It is, however, liable to inflammation, enlargement, induration, and scirrhus, the symptoms attending which are generally very distressing, often terrible, and scarcely to be alleviated, for the shortest space, by all the powers of medicine.

Disease of the prostate gland is very rarely met with at an early age, but chiefly appears in the decline of life. Those most liable to a morbid state of it, are such as have led a life of habitual drunkenness, and great irregularity.

It has been sometimes, although rarely, attacked with common inflammation, ending in abscess.

It has also, on particular occasions, been considered as affected with a venereal taint. A diseased enlargement of it, supposed to be of a scrophulous nature, is by no means very uncommon. But the morbid affection to which it appears to be most generally liable, is a state of slow inflammation and induration, ultimately ending in scirrhus. The symptoms of this state of the disease are

of the most distressing kind, and are to be considered as incurable.

The prostate gland surrounds the neck of the bladder, but is chiefly situate behind and laterally. Its bulk varies a little in different men ; in general, it is nearly about the size of a walnut or chestnut in its natural state ; but, when diseased, it is often found six or eight times larger.

A difficulty of making water, and an obstruction of its flow, are common attendants of diseased prostate gland, which has been generally ascribed to the enlargement of the lateral lobes compressing the sides of the urethra ; but this, in fact, appears not to be the case. “ The
“ prostate gland,” Mr Home remarks,
“ in its enlargement, does not diminish
“ the size of the passage into the blad-

“ der, but rather increases it. The la-
“ teral portions of the gland, as they
“ swell, widen the passage between them,
“ rendering it of an oval form ; it is
“ therefore the projecting portion from
“ the lower part which prevents the
“ urine from flowing, and obstructs an
“ instrument in its passage to the blad-
“ der.” This explains how it some-
times happens that the prostate gland is
found considerably enlarged, without
producing any material trouble or diffi-
culty in the discharge of urine. In this
case it is to be inferred, that the swelling
is confined to the lateral lobes, and has
not affected that posterior portion of it
which lies immediately behind the ure-
thra.

We learn from the observations of
Mr Hunter and Dr Baillie, that when
swelling occurs in this posterior extre-

mity of the gland, which lies immediately behind the beginning of the urethra, it forms a considerable projection into the cavity of the bladder. According to the extent of swelling, and of this projection, will be, not only the difficulty of passing water, but of introducing a bougie or catheter into the bladder; for if swelling do not take place in this part of the gland, in the manner described, either of these instruments can be passed with ease. But the enlargement of this posterior part of the gland, and its projection into the cavity of the bladder, are occasionally so great, that it becomes impossible to pass the catheter over it. In such cases, we find that the instrument has sometimes been forced through the swelling, without occasioning any uneasiness or trouble, the urine drawn off from time to time, and, in this way, a miserable existence has been

prolonged to the patient. Mr Hunter mentions his having met with different instances where this happened, but, in one instance, the blood from the wound passed into the bladder, and occasioned death. This step, therefore, should never be attempted but from the most urgent necessity, and not till every endeavour has been made to pass the point of the instrument over the swelling. For this purpose, Mr Hunter advises us, if, upon introducing the catheter into the bladder, the urine does not flow, to push it on, and depress the handle, so as to reach the fundus of the bladder with the end of the instrument; and in this way, he says, he has always succeeded. He also recommends the employment of a bougie with the point very much bent, and the introduction of it made with the concave side towards the pubes.

A farther difficulty is sometimes met with in the introduction of a catheter from this circumstance, that the prostate gland, when diseased, does not always enlarge regularly, but, swelling more on one side than on the other, occasions a winding in the passage of the urethra.

The symptoms of disease in the prostate gland, if it should occur unconnected with other disorders, are so similar in its early stages, to those arising from stricture or stone, that it is very generally mistaken for one or other of these complaints. As the disease advances, and the enlargement increases, it commonly produces such distress, as soon leads to an investigation that discovers the real nature of the case.

Obstruction to the flow of urine from disease of the prostate gland, in the man-

ner already mentioned, with irritation and increased frequency of desire to pass it, may certainly lead to a suspicion of strictures; but, at the same time, in the advanced stages of the former complaint, as already observed, the two diseases can scarcely be confounded, except from great remissness and inattention on the part of the surgeon. It is, however, more than probable, that in former times such mistakes very frequently happened from the want of anatomical knowledge, and from ignorance of the nature and real seat of stricture; and hence, no doubt, arose those dreadful accidents which we are told of, from the use of caustic remedies for the removal of obstructions in the urethra. If proper attention be paid to the particular points of the urethra where strictures for the most part are formed, such mistakes cannot easily occur. They are never

found to take place deeper than the beginning of the bulbous part of the canal ; and, therefore, when a bougie or catheter is obstructed beyond this, that is, deeper than six inches and a half or seven inches from the external orifice, the prostate gland may be suspected to be the cause. If this gland be enlarged, it will very readily be discovered to be so, by the finger introduced into the rectum ; so that, when symptoms any way equivocal do occur, few surgeons will conclude these to arise from a morbid state of the prostate gland, without such an examination. Yet I know of one case of strictures cured by the lunar caustic, where the disease was conceived, by the surgeon in attendance, to lie in the prostate gland, and where a more careful examination by Mr Home discovered the mistake.

The symptoms arising from stone in the bladder are likewise often similar to those of enlargement and induration of the prostate gland ; but the passing of a sound into the bladder, and the introduction of the finger into the rectum, will serve to ascertain the nature of the complaint with the greatest precision. I recollect the case of a gentleman who came under the care of Dr Monro and the late Mr Benjamin Bell, a great many years ago, which may be mentioned here as a proof of the necessity of careful investigation in these complaints. The symptoms led them to suppose the presence of a stone in the bladder, and of consequence to propose the operation of sounding. The gentleman had not resolution to submit to this, and soon after went to London. A surgeon there, of the very highest reputation, since dead, pronounced the complaint to be disease of the

prostate gland, recommended to the patient to retire to the country, to avoid all exercise, live very temperately, and drink decoctions of sarsaparilla. Here, however, his distress increasing, he again came to Edinburgh; but, having been impressed with the certainty of his disease being in the prostate gland, he still positively refused to be sounded. After much suffering he died. Upon dissection by Mr Bell, the prostate and neighbouring parts, to the best of my recollection, for I was present, were uncommonly free from any disease, but a stone of considerable size was found in the cavity of the bladder.

THE degree of distress attending a diseased state of the prostate gland, will depend upon its particular nature. An

indolent enlargement of it sometimes takes place, which seems to be scrophulous, and is not attended with much pain. In such cases, where the enlargement is not very considerable, and especially if the posterior part of it be not affected, but little interruption is given to the flow of urine ; and many people, with such a disease, have gone about for a long time without suffering very material inconvenience. But where the inflammation and enlargement are of that nature, as to end in scirrhus, the sufferings generally become very dreadful, especially if the scirrhus proceeds to a state of cancerous ulceration, which, however, appears to be a rare occurrence.

IN the treatment of diseased prostate gland, the practitioner must be chiefly guided by the ascertained state of the complaint ; and upon this state will depend the chance of a cure, or even of effectual alleviation of urgent symptoms.

Where it is attacked with acute inflammation tending to suppuration, every endeavour must be used to prevent this, by copious general, and more especially by topical evacuations of blood; by cooling laxatives, and emollient injections; and by low diet, rest, and cool air. If the inflammation produce suppression of urine, we must endeavour to promote its discharge by the warm bath, by opiate injections, and, if it can be passed, by the introduction of a catheter, or

probably of a bougie, in the manner directed by Mr Hunter. Every means failing, and the suppression continuing, there will be a necessity for puncturing the bladder, which, in this case, will be best and most conveniently done above the pubes. If suppuration take place, and the part affected should not appear to heal readily, this process may be assisted by the free use of Peruvian bark, of uva ursi, the turpentine, and the balsamum copaibæ; by drinking freely of lime water, and decoctions of sarsaparilla. The diet should be light and nourishing, and the bowels kept very regular.

When the morbid condition of the prostate gland seems to arise from a venereal taint, a cure can be expected only from a full mercurial course, which

perhaps may be aided by decoctions of mezereon.

When the disease appears to be of a scrophulous nature, the cure must be attempted by the use of cicuta, bark, muriat of barytes, burnt sponge, and sea-bathing. In such cases, we are told by Mr Hunter, that an issue in the perinæum has been found of advantage.

But perhaps the most common, and certainly the most dreadful state of disease in this organ, is that of scirrhus. For this there is no cure. All that can be looked for from the powers of medicine, is alleviation of urgent symptoms, and temporary relief from pain. For these purposes we principally trust to the free and constant use of opiates by the mouth, and still more so to their employment in the form of injection, or to the introduc-

tion of opium in substance into the rectum, by means of a bougie. The extract of hemlock may also be tried in this melancholy state of the disease, and may be either taken into the stomach, or may be introduced, as lately recommended, in the form of a suppository, into the rectum. The extract of hyoscyamus in large doses has been found a good medicine. It has the advantage over opium, as formerly stated, of not producing costiveness; on the contrary, it generally operates as a gentle laxative. An open state of the belly is essentially necessary.

As a means of temporary relief, the warm bath may be very frequently employed, and for this purpose is a very valuable remedy.

Amongst other remedies, decoctions of sarsaparilla were strongly recommend-

ed by the late Mr Pott, in scirrhus of the prostate gland.

These, with complete rest, and the strictest temperance, seem all that can be done in this miserable complaint.

The means recommended by Mr Hunter for drawing off the urine, when suppression of it takes place, have already been mentioned.

CHAP. IV.

OF STRICTURES IN THE URETHRA.

UPON this interesting subject much has been written within the last twenty years, and, in the surgical treatment of a disease so common, and in general so distressing, considerable improvement has been introduced, the value of which, however, is not so universally admitted as it seems to deserve.

Strictures may be produced by various causes exciting and keeping up inflammation and irritation in the canal of the urethra ; but they most commonly arise from neglected, or ill-treated go-

norrhœa : it may therefore be supposed, that these obstructions became very frequent soon after the introduction of the venereal disease into Europe ; and, accordingly, we find them justly considered as one of the most distressing effects of this malady, by the practitioners of the sixteenth and seventeenth century.

Imperfect as the art of surgery then was, the cure of this disease seems to have been frequently attempted by means similar to the practice at present followed with so much success, that is, by the application of *caustic*, or, as they were termed, *catheretic* remedies. This method of treatment, even in those days, was often attended with the happiest effects, and many instances, some of them very noted ones, of well authenticated cures in this way, are to be found in different ancient authors. But at a period when

the knowledge of anatomy was so limited, and the art of surgery in a state so rude and imperfect, it may well be supposed such a mode of cure would often be attended with very distressing consequences ; and, accordingly, the employment of caustic or cathartic applications appears to have fallen gradually into disrepute, and at the time of Astruc and Daran, was, in a great measure, given up.

The reputation acquired by Mr Daran, for the successful treatment of strictures, is well known. He may be considered the first practitioner who led to the proper use of the common bougie. He carefully kept secret the composition of those he employed, but there are strong grounds to believe, that they possessed a certain degree of causticity. It is well known, that he considered their action

not as mechanical, but as exciting inflammation and suppuration in the caruncle or excrescence, which he believed to be the almost universal cause of obstruction : and that caustic bougies were used in France more than a century before his time, is evident from the language of the younger Riolan, who, speaking of the supposed "*fungosæ carnes*," that obstruct the urethra, adds, "*quas facile est exedere candelis cereis medicatis, ad id destinatis et aptatis.*" *

From the time of Daran, the common bougie acting, according to general belief, entirely as producing mechanical dilatation, came gradually into regular use ; and no other improvement took place in the management of strictures,

* Riolan's *Encheiridion Anatomicum*, lib. ii. cap. 30. Riolan flourished about the year 1607, Daran about 1745.

until the late Mr John Hunter, experiencing the insufficiency of the common bougie to produce a permanent or radical cure in many cases of the disease, revived the exploded practice of caustic applications. For this purpose he employed the lunar caustic, which was unknown, or, as far as now appears, not used in former times. The result of the first trials made by him of this active remedy, sufficiently satisfied him of its efficacy, and confirmed him in the propriety and advantage of continuing to use it. The extensive and uncommonly successful practice of Mr Home of London, in the removal of strictures by means of the lunar caustic, is well known, and, joined to the prior experience of Mr Hunter, not to mention other authorities, appears perfectly decisive of the superiority of this method of cure, at least in the worst and more ob-

stinate cases of the disease, over the mode of treatment by the common bougie; accordingly, the practice daily gains ground. Yet it is not without its opponents, and seems not unlikely to become a subject of considerable controversy, having been hitherto condemned by many practitioners of respectable authority.

THE first approaches of strictures in the urethra are often so obscure, that they cannot be easily traced; yet, sooner or later, the disease fails not to give rise to much distress. The circumstance which probably first attracts transient notice, is an occasional slight diminution in the stream of urine, with perhaps a longer observable time in emptying the

bladder than formerly ; but such a state being unattended with pain, or any inconvenience, it soon ceases to be remarked. In this way the complaint is sometimes found to remain, for a great length of time, without occasioning any particular uneasiness or trouble. This stationary condition of it, however, does not very often take place, but, in the course of its progress, the diminished stream of urine becoming more apparent, begins to be attended with symptoms of irritation. The first serious attack of distress commonly follows immediately some great irregularity of living, hard drinking, hard riding on horseback, exposure to wet and cold, &c. By any of these exciting causes, the slight symptoms of obstruction, which had probably remained for a considerable time stationary, become suddenly much increased ; and, from this period, such a

state of irritability is induced in the parts, that very trifling causes will afterwards produce a renewal of distress. The stream of urine becomes considerably smaller, the desire to empty the bladder much more frequent, and the efforts used for this purpose much greater: the urine flows not as formerly, in a full stream, forming an arch, but either dribbles down perpendicularly from the orifice of the urethra, scatters about, or comes out forked, in two small separate streams. Under these circumstances, any irregularity, the slightest excess, wet feet, or exposure to cold, will excite irritation and aggravate all the symptoms. When this happens, the desire to pass urine is more frequent, painful, and difficult; the stranguary becomes very harassing; the urine comes away in drops, and sometimes total suppression ensues. In this condition, the means resorted to

for relief generally produce a remission of the symptoms. These means are rest, fomentations, the warm bath, opiates by the mouth and anus, diluents, cooling laxatives, and other antiphlogistic remedies. By the employment of these, the spasm abates, the urine begins to flow in drops, then in a small stream, and by degrees the patient returns to that state in which he was previously to the attack. Such a favourable termination, however, does not always take place; the spasm and inflammation continue obstinate, and all the dreadful consequences of total and permanent suppression of urine follow. When this happens, in some instances the inflammation is communicated to the peritonæum, and in this way proves fatal.

An obstinate gleet is very commonly an attendant on stricture, and, for the

most part, disappears when the obstruction is cured. In some instances, the discharge is a glary mucus, seemingly the liquor of the prostate, in consequence of the inflammation being communicated to this gland. In others, the discharge is evidently purulent, is in considerable quantity, and seems to be produced by the internal coat of the bladder in a state of inflammation.

WE are led to believe, that in certain constitutions there takes place a peculiar disposition to the formation of stricture; and in such constitutions, it is easy to imagine how occasional attacks of spasm, arising from various sources of irritation, may produce this disease. Thus, any morbid condition of the kidney, blad-

der, prostate gland, or other neighbouring parts, gravel and stone will be found at times to act in this way. But of all the causes giving rise to these obstructions in the urethra, neglected or mismanaged gonorrhœa has very generally been considered the most frequent, although this would seem contrary to the opinion of the late Mr John Hunter. However, it does not appear that gonorrhœa gives any peculiar disposition to their formation, except as proving a very common cause of inflammation through the whole canal of the urethra. The common seats of gonorrhœa, and of stricture, are very seldom found to be the same; but, although in the former disease the natural seat of the complaint is near to the orifice of the urethra, any irregularity of living, violent exercise, improper use of injections, and other causes, will produce severe inflam-

mation along the whole canal ; and this becoming very irritable, acquires a disposition to spasmodic action, by which is laid a foundation for the formation of strictures. This disease is particularly frequent amongst those men whose habits and pursuits in life unavoidably expose them to great irregularity and fatigue, when affected with gonorrhœa ; and hence it is found a very common complaint with sailors and soldiers.

How far the use of astringent injections for the cure of gonorrhœa does or does not dispose to the formation of strictures, is a point about which practitioners are by no means agreed. It would appear, that the experience and observations of Mr Home have induced him to be of the former opinion : “ From an idea,” he says, “ that injections do sometimes produce strictures,

“ and that we are unable beforehand
“ to determine in what cases they may
“ be used with impunity, I have been
“ induced entirely to forego their use
“ in gonorrhœa, rather than incur a
“ risk, however small it may be, of
“ producing so seriously distressing a
“ complaint.” Mr Home’s authority
upon this point ought certainly to stand
very high ; but there is much reason to
infer, that the more general and oppo-
site opinion will be found right ; and
that the proper employment of injec-
tions for the cure of gonorrhœa will di-
minish the risk of a disposition to the
formation of strictures taking place. It
is well known, that, under the most ju-
dicious treatment, the removal of go-
norrhœa is frequently both tedious and
troublesome. Those commonly affected
with it are the young and inconsiderate,
who too often cannot, or will not ob-

serve that strict regularity so necessary for a speedy cure. In such cases, if no injections be used, the inflammation generally becomes severe, the discharge continues long virulent, not uncommonly ending in obstinate and troublesome gleet. In this way the disposition to stricture seems often to be induced; and this opinion even seems to derive confirmation from a remark of Mr Home himself, who observes, that “three
“fourths of the natives of rank in India are troubled with strictures, which
“is entirely attributed to the effects of
“gonorrhœa, for the cure of which no local applications are in use.” He proceeds, it is true, to explain this as arising from a peculiar indulgence in gross and sensual enjoyment, prevalent amongst these people; but there appears reason to conclude, that it really happens from a neglect of the use of injections. At the

same time, it must be admitted, that these remedies, which are too often in very injudicious hands, do frequently give rise to the formation of strictures; but this is no argument against their prudent and proper use. In particular constitutions, the simplest injections will induce irritation and inflammation along the whole course of the urethra; and in such cases, certainly, it would be highly improper to persevere in their employment.

Before quitting this subject, it may not be improper to notice a very prejudicial method, sometimes recommended, of using injections for the cure of gonorrhœa, namely, to throw up the liquid through the whole length of the canal of the urethra, at least advising no pressure to be used for preventing this. The mildest fluid so injected will excite

spasm and uneasiness; and a perseverance in such a method, perhaps for weeks, may of itself produce a tendency to stricture. Nor is such practice necessary; the usual seat of gonorrhœa is not above an inch from the external orifice of the urethra, and, where the inflammation spreads backwards, and the infection seizes on the deeper seated parts, all injections whatsoever will undoubtedly be found prejudicial.

ALTHOUGH, as already stated, it appears in some measure contrary to the opinion of the late Mr Hunter, the general belief is, that, for the most part, strictures are occasioned by gonorrhœa, or by the employment of improper means for its removal. At the same time, it is unquestionably true, that they are frequently brought on by various other causes, exciting and keeping up irritation, spasm, or inflammation, along the canal of the urethra. In this way strictures are often found connected with gravel and stone, with disease of the kidney and coats of the bladder, and with a morbid state of the prostate gland. They have also been known to arise from piles; and there are cases record-

ed by Mr Home, of permanent strictures being induced by temporary irritation of the parts following the use of blisters.

But although any morbid state of action of the neighbouring parts may thus produce strictures, it must be remarked, that the diseases above mentioned appear more frequently to be a consequence than a cause of urethral obstructions. When these are of long standing, and accompanied with almost constant irritation and inflammation, they are very apt to excite enlargement and ulceration in the prostate gland. The inflammation induced by strictures is sometimes communicated to the internal coat of the bladder, and a copious purulent discharge takes place, with thickening and contraction of its muscular coat; or being sometimes propagated through the

ureter to the kidney, a state of disease of that organ is thus brought on.

Therefore, where such morbid combinations are met with, it will be of the greatest advantage in directing the proper treatment; and in forming a judgment of the probability of a cure, carefully to trace all the symptoms from their beginning, disregarding any previously formed opinion of the patient himself, which, if in any degree admitted, is very apt to mislead. *

* Since writing the above, I have had an opportunity of perusing Mr Abernethy's Observations upon Diseases of the Urethra. His experience has led him to conclude, that that portion of the membranous part of the canal, which passes through the prostate gland, is much more frequently the seat of disease than is commonly imagined. He admits, that this part of the urethra is often affected by irritable bladder, and by stricture, but he thinks it more frequently exists as an original and independent disease. He is of opinion, that a combination of this morbid state, with stricture, will often ac-

A DISTINCT and familiar knowledge of the exact situation of strictures, and of that morbid state of the urethra causing the obstruction, will be found highly important in directing means to be applied successfully for their removal. The ancient practitioners appear to have had very erroneous notions about this; and even so late as the time of Astruc,

count for that discordance in the result of cases apparently similar, so frequently met with. It is evident that a permanent removal of stricture in such cases is by no means probable, by any mode of treatment, as the morbid tenderness of the urethra must continue to act as a cause of constant irritation. Mr Abernethy observes, that in such cases the enlargement of strictures fails to mitigate the dysury; that, in others, it is augmented by the measures which have been employed to cure the obstructions. He remarks, that he has relieved strictures without materially benefiting his patients: he seems to think that in these cases he does not aggravate

the discharge in gonorrhœa was supposed to proceed from ulcerations formed in the deep seated parts of the urethra, in the prostate gland, in Cowper's glands, &c. and hence arose confusion, and ignorance of the real nature of stricture. We find Astruc enumerating different causes of obstruction, which are now scarcely allowed to exist, such as callous ill digested ulcers, supposed to produce the discharge of matter in gonorrhœa; callous cicatrices, left by the healing of

the symptoms, because he is cautious not to hurt the canal, where it passes through the urethra; and he gives the following important and useful caution: "Some cases of disorders of the urinary organs are made worse in the attempt to cure strictures; and I think I deliver an important admonition to the younger part of the profession, when I caution them to beware, in their attempts to cure strictures, that they do not irritate or injure the last inch of that canal, where there are no strictures, but in which considerable disorder may nevertheless exist."

Vide ABERNETHY on Diseases of the Urethra, &c.

these ulcers; fungous excrescences, or caruncles as they were called, sprouting up in the urethra, &c. But about this time different anatomists, Morgagni, Dionis, and others, from repeated dissections, and careful observation, doubted, and even denied the existence of these causes, considering strictures as being produced by a contraction and thickening of the corpus spongiosum urethræ.

To the late Mr John Hunter we are principally indebted, for ascertaining with accuracy the real state of the urethra when strictures are formed there. From his remarks we learn, that the disease frequently occupies no great length of the passage; that in most of the cases which he had an opportunity of investigating by dissection after death, the contraction extended no further in breadth than if the part had been surrounded

with a piece of pack-thread; and, in many cases, it had a good deal of that appearance. At the same time, he adds, that he has seen the urethra irregularly contracted for above an inch in length, owing to its coats, or internal membrane, being irregularly thickened, and forming a winding canal.

The experience and observations of Mr Home coincide with and confirm those of Mr Hunter, as appears from the following quotation: "The thickness of
" a stricture is a subject on which there
" are many different opinions, and some
" have supposed it to be of considerable
" extent. It is, however, commonly no
" more than the thickness of a single
" fold or doubling of the membrane of
" the urethra. The ridge which pro-
" jects into the canal can only be a
" single fold, with the cellular membrane

“ between the two portions ; it will be
“ thicker as it approaches the sides of
“ the urethra.”

The account of strictures given by Dr Baillie in his morbid anatomy, is equally clear and precise. He has found the obstruction to consist, sometimes of an approximation simply of the opposite sides of the canal, so as to form a line of obstruction, and, at other times, the canal is narrowed for some length. He observed the inner membrane at the stricture sometimes exhibiting the natural appearance of surface, at other times the surface abraded or ulcerated ; and these effects he supposes to be generally produced by the employment of common bougies.

It is of the greatest consequence to attend particularly to the foregoing facts

and observations, and to become familiar with them. In treating strictures by the lunar caustic, three or four applications will often be found sufficient to remove the obstruction ; while in other instances, to appearance equally favourable for a speedy cure, much disappointment will frequently be experienced in the length of time requisite for accomplishing this. Where the cure has been easily effected, it may be presumed that the stricture was produced by a single doubling of the membrane of the urethra, the canal probably being, according to Mr Hunter's idea, as if surrounded by a pack-thread : but where, on the other hand, the cure proves tedious, it is to be inferred, that a considerable portion of it is in a state of contraction.

From the remarks of both Mr Hunter and Mr Home it would also appear,

that the strictured portion is sometimes confined to one side of the canal, by which means the passage is thrown over to the opposite side, thereby increasing much the difficulty of introducing a bougie. Mr Home still further notices a circumstance which he considers as readily accounting for the opinion of strictures being of some thickness: this is, two strictures forming within an inch of each other, and the space between them becoming narrower than the rest of the canal.

JOINED to an acquaintance with that state of disease in the membrane of the urethra, constituting a stricture, an exact knowledge of those points of the canal where these obstructions are formed, will likewise be found very useful in their surgical treatment. Every surgeon much conversant in this part of practice, must have remarked, that in almost every case of stricture, the obstructions are found in the same precise parts of the urethra. Mr Home has particularly directed our attention to this circumstance. Having taken accurate moulds of the urethra, he found that its diameter was not uniformly the same throughout, but that in its natural state it is considerably contracted at certain points; and he has ascertained, that at these points strictures

are most generally formed. The most common seat of the complaint he has found to be immediately behind the bulb of the urethra, “ the distance from the “ external orifice being six and a half or “ seven inches. The situation next in “ frequency is about four and a half “ inches from the orifice of the glans. “ They do occur at three and a half.” In other words, the most common seat of the complaint is immediately beyond the bulb of the urethra, and a little beyond the middle of the canal, measuring from the orifice to the arch of the pubes ; for, as Mr Sherwin says, “ there is “ no admeasurement of the length of “ the urethra, from the extremity of the “ glans to the neck of the bladder, that “ can be depended on for preventing a “ mistake of this kind ; because an hor- “ riplation of half a minute is capable “ of making an alteration of two inches

“ or more in the length even of the ure-
“ thra already flaccid.”

As the most common seat of stricture is immediately behind the bulb of the urethra, according to Mr Home's observations, so he is of opinion, that those which are formed nearer to the external orifice are only secondary, and have taken place after the former has continued for some time, in consequence of the diminution of the stream of urine, whereby the urethra does not receive its usual dilatation.

IN the surgical treatment of strictures of the urethra, little progress or improvement seem to have been made till the time of Daran. Prior to this period, the use of the common bougie, as now applied to practice, was unknown, and in place of it different kinds of metallic probes chiefly were employed for the purpose of removing these obstructions. But the insufficiency of such means to this end, or even in general for giving much alleviation of the symptoms, led many practitioners of the sixteenth and seventeenth century, as formerly mentioned, to the bold and active practice of endeavouring to cure the disorder by the application of caustic substances. In this way, it is certain that cures were often effected; at the same time it cannot be

denied, that extensive mischief frequently followed such a method of treatment, owing, in a great measure, no doubt, to the general want of anatomical knowledge; to ignorance of the nature and seat of the obstructions so treated; want of dexterity, and unskilfulness in the application; and perhaps, above all, to an improper choice of the caustic substances employed. Accordingly, as was remarked, this practice fell into disrepute, and, in the time of Astruc and Daran, appears to have been entirely abandoned, and the common bougie, as now used, brought into general employment. The merit of this important improvement in the practice of surgery, appears to be due to Mr Daran. The extensive employment and well merited reputation which he acquired in curing strictures of the urethra, by means of what he called medicated bougies, is well known.

In the composition of these, he affected concealment. It has frequently been contended, that the benefit arising from their use must be ascribed solely to their mechanical action, producing dilatation of the contracted part of the canal; but it seems more than probable, that these bougies did contain some active stimulating substance, which inducing inflammation, suppuration, and perhaps absorption, thus effected a removal of the obstruction. Mr Daran himself was firmly of this opinion, and believed that his bougies cured the disease by exciting inflammation and suppuration in the caruncle or excrescence, which he considered the cause of the obstruction.

From the time of Daran, the common bougie, as at present employed, varying perhaps occasionally in composition, came to be generally adopted, and the

great and important advantages attending its use are known to every surgeon ; such dreadful cases of stricture, as there is reason to believe frequently happened before its discovery, being now very seldom met with.

The late Mr Hunter admits the bougie with its application to be “ one of the “ greatest improvements in surgery ;” but whilst he thus allows its full value, he does not hesitate to say, that the dilatation effected by the bougie is seldom or ever more than a temporary cure ; “ for,” he observes, “ although the passage may be dilated sufficiently for “ urine to pass, yet there is always the “ original tendency for contraction, “ which generally returns sooner or later.” The truth of Mr Hunter’s observations respecting the insufficiency of the common bougie to accomplish any

thing like a complete or permanent cure of these obstructions, if the disease be of long standing, and far advanced, is known to every surgeon of much experience in the treatment of strictures. Where bougies can be used without exciting much irritation, and their use is persevered in for a considerable length of time, unquestionably much relief, and great dilatation will be obtained; but when the remedy is laid aside, especially if the patient, in place of carefully guarding against causes which will probably excite a renewal of irritation, again pursue irregular habits of life, the contraction seldom fails to return, and with it, of course, the necessity for a recurrence to the employment of bougies. Convinced of the truth of this, as we have already seen, in the course of his extensive practice, Mr Hunter was induced to try the effects of caustic applications, and

it may be safely said, that his success, followed by that of others, particularly of Mr Home, appears fully to have established the superiority of this method of cure over that attempted by means of the common bougie, at least in the worst and more inveterate cases of the disease.

IN the treatment of strictures in the urethra, the attention is necessarily called to those means which are requisite for obviating urgent symptoms arising from attacks of spasm and inflammation.

It has been usual in considering these obstructions, to divide them into the permanent, and the spasmodic stricture. The permanent stricture, from the ear-

liest state of its formation, through its whole course, is almost constantly attended, more or less, with spasmodic irritation; and it seems probable that its first approaches, are in many instances, considered as symptoms of purely spasmodic stricture, which, perhaps, is by no means a frequent occurrence, although we certainly have the testimony of Mr Hunter, Mr Home, and others, that it does happen.

The removal of symptoms of irritation and spasm, whether accompanying the permanent or the spasmodic stricture, is to be accomplished by the same means; these are, opiates given freely and largely by the mouth and anus, the warm bath, fomentations, laxatives, and laxative injections. If the constitution be robust, and the symptoms of inflammation at any time threatening,

the free evacuation of blood, especially by the application of leeches, ought not to be delayed. If the spasm be obstinate, it will frequently be relieved by the application of blisters to the loins, and even to the perinæum. If the stranguery which is brought on, do not yield, and the urine accumulate, it becomes necessary to empty the bladder of its contents, either by means of the catheter, when it can be made to pass the stricture; or, what will often succeed, and if so, is much more adviseable, by the introduction of a common bougie. Even although this does not pass the strictured part of the urethra, yet, by allowing it to remain in contact with it for a few seconds, the spasm will often suddenly cease, and the urine flow off with sufficient freedom to give immediate relief,

However troublesome these attacks of spasm may prove, and although the suppression of urine is very frequently alarming, it rarely happens that the above means fail, sooner or later, to procure relief for a time from all the symptoms. But, occasionally, every method for obtaining a discharge of urine fails, the inflammation increases, suppuration or gangrene takes place, and the urine, bursting through the urethra behind the stricture, is diffused over the surrounding parts; and one or more external openings having formed, the disease of fistula in perinæo is produced. Some years ago, I had occasion to attend a patient, along with Dr Monro, senior, where suppression of urine from stricture terminated in this way. A most extensive suppuration took place, and the matter pointing in the perinæum was discharged by an incision. The whole of

the scrotum sloughed off, and also a considerable portion of the skin of the penis, and of the perinæum, leaving the testicles quite uncovered. After a complete separation of the gangrene had taken place, healthy granulations sprouted up, and the whole extensive sore soon put on a good appearance; the testicles gradually became covered; and the stricture, which appeared nearly to have obliterated the passage, being removed by a few applications of lunar caustic, the parts in a short time closed, and healed completely up. This person is at present in perfect health.

It has been seen, that for the permanent removal of strictures of the urethra, two modes of treatment are employed, the use of the common bougie, and the application of caustic substances. It has been already stated, that the common bougie is understood to effect a cure of these obstructions by mechanical dilatation ; but it may likewise be so applied as to induce inflammation, suppuration, and absorption of the strictured portion of the urethra. A bougie kept in constant contact with a stricture which it cannot be made to pass, will perhaps, in process of time, effect a cure in this way ; the propriety, however, of such a method of treatment is extremely doubtful, as an artificial passage by the

side of the obstruction may readily take place from it.

When a stricture is far advanced, especially as it is seldom unaccompanied with spasm, it is very difficult to pass the smallest bougie, and very often this is only to be accomplished after repeated trials. To facilitate this, it will be found of advantage previously to employ those means which obviate spasm, particularly opiates and the warm bath. Much is gained where a bougie, however small, can be passed; and, by degrees, according to the extent of dilatation produced in the strictured part, larger bougies may be used. The degree of dilatation, and the time requisite to effect it, it is evident, must vary in different cases, according as the greater or less degree of irritability present admits of a longer or more limited continuance

of the bougie in the urethra. The length of time during which a bougie should be allowed uninterruptedly to continue in the passage, must depend entirely upon the feelings of the patient, and ought never to be permitted to remain so as to excite pain and irritation.

The common bougie, if its use in this way be patiently, constantly, and long persevered in, and its size gradually increased, will unquestionably produce considerable dilatation of strictures; and a recurrence to it, from time to time, when the symptoms of obstruction threaten to return, will enable those affected with this harassing complaint to pass through life with tolerable comfort, especially if not subjected to severe or active occupations. Indeed, in many cases of stricture, which are neither of long standing, nor perhaps far advanced, the common

bougie, if judiciously employed, may effect a complete and permanent removal ; and where this can be done, such a method of treatment will certainly often be preferable to any other means. It may, however, be freely asserted, that in a great proportion of those cases where strictures are of long standing, and the contraction is very considerable, accompanied with much spasm, the common bougie will seldom be found more than a palliative remedy, and, as such, no doubt of the greatest importance. Whereas, from the concurring testimony of the late Mr Hunter, Mr Home, Mr Whately, and others, who have written on this subject, joined to the daily experience of many other respectable practitioners, there seems no room to doubt, that repeated applications of lunar caustic will assuredly effect a permanent cure in a great proportion of those cases of stric-

ture which are simple, and not combined with a state of disease in the neighbouring parts, in many of which the common bougie will certainly fail. But this practice, as formerly stated, is not without strong and decided opposition. A long catalogue of most serious and alarming evils, alleged to result from the employment of caustic, has been enumerated. The evidence of such extensive mischief, there is reason to presume, must be drawn from those times when the art of surgery was less advanced, and when, it has been already admitted, such misfortunes were not unfrequent. But there is reason to conclude, that the want of success in those days was imputable to the practitioner; that it arose from want of anatomical knowledge; from erroneous notions of the nature and situation of strictures; from want of skill and dexterity in applying the means of

cure; and probably also from the employment of improper caustic substances. No such distressing consequences are ever heard of now to follow the application of lunar caustic to strictures, in the manner first suggested by Mr Hunter, and since improved by Mr Home and others. In this particular branch of practice, Mr Hunter, and still more Mr Home, have certainly had more extensive experience than any of their brethren. Mr Hunter's practice furnished no such instance of these alleged bad effects, as could alter his sentiments respecting this mode of treatment. Mr Home, indeed, details numerous cases with candour, and states fairly some circumstances, at all times no doubt embarrassing and unpleasant, which frequently will occur from employing a means of cure so active, but which he never found to be attended with any serious consequences.

I know the sentiments of more than one respectable practitioner, of this place, to be completely in favour of the method of treatment by caustic, after considerable experience. I have myself followed the practice for many years, and although I have met with cases where the success was not equal to my expectations, I have never seen any untoward symptom produced by the application. It may, therefore, with some confidence be inferred, that the method of curing strictures of the urethra by the application of lunar caustic, will gain ground, notwithstanding the respectable opposition which it has met with.

Whilst the superiority of this mode of practice is thus asserted, it would be wrong to dissemble the danger likely to arise from too free and indiscriminate an use of caustic ; but here, as in other

departments, much must be left to the prudence and discretion of the surgeon. Where there is great inflammation, with much irritability, it will surely be always judged prudent to defer the employment of caustic until these are abated. Or, where strictures are combined with a state of disease in the neighbouring parts, the use of caustic must not be rashly resorted to, especially until we have been able to ascertain with some accuracy which is the primary affection.

The method of cure, by the application of lunar caustic, has been objected to on various grounds: in the first place, on account of its severity, and of the intense pain which it is alleged to produce along the whole course of the urethra. This objection, however, is not well founded. Few people are indeed so hardy as not to experience consider-

able apprehension upon the first proposal of the caustic ; but, for the most part, the trial proves their fears to have been in a great measure groundless. No doubt, where there is much inflammation, and the parts are very tender and irritable, a considerable degree of pain will be excited by the application of caustic to the urethra ; still, however, this very rarely is so great as not to be easily indured, and generally subsides in a few minutes after withdrawing the loaded bougie. But, in the greatest number of cases, the pain excited is trifling, and seldom hinders the person from following his usual occupations. As a proof of the little pain or inconvenience arising from the use of caustic, Mr Home mentions different cases, where, by accident, the piece of caustic was detached from the end of the bougie, and left entirely in the urethra, without exciting

either uneasiness or trouble so as to be taken notice of. Indeed, no very uncommon effect of the application of caustic to a stricture, is immediately to take off, in a great degree, that spasmodic irritation, which, to most people, is certainly more distressing and intolerable than acute pain.

There are some men so extremely irritable, as not to be able to surmount the dread excited by the proposed application of caustic, the very mention of which never fails to excite immediate spasm in the urethra, thereby rendering more difficult the introduction of the instrument. In such cases, the same apprehension not being felt for the common bougie, it may be of advantage to deceive the patient, and under this cover a loaded bougie may be passed with greater facility. Where this great de-

gree of irritability is met with, it will also be frequently serviceable to administer a full dose of opium, an hour or two previous to the application of the caustic. In one case of this kind, I found the practice invariably attended with the best effects ; and, when the opiate was omitted, the state of spasm in the parts never failed to prevent the effectual use of the loaded bougie.

Another objection to the use of caustic is, that it is said to produce dangerous suppression of urine. If this method of treatment be practised when the urethra is in a state of high irritability and inflammation, undoubtedly it is easily conceivable that such an occurrence may take place ; however, there is room to believe that it happens very rarely, and only in those cases, where, from the state of the parts, a prudent surgeon

would decline the use of the caustic ; or, in all probability, it happens more frequently from some great imprudence or irregularity on the part of the patient, during the use of the remedy. Where suppression of urine does take place, there seems no reason to apprehend more than the temporary inconvenience and distress, as it will be found to yield readily to the usual means for removing such a complaint.

A discharge of blood, and that sometimes to a considerable extent, is far from being a rare accident attending the application of caustic to a stricture ; but the same thing will often happen from a free employment of the common bougie when the urethra is very tender. However embarrassing it may prove, and alarming to the patient, no serious

consequences are ever to be apprehended from it.

Swelling of the testicles frequently takes place from the irritation excited by the employment of the common bougie. The same thing may follow the use of caustic, although I believe this to be a very rare occurrence. But in neither case does there appear the least reason to suppose that such swellings will be permanent, as has been alleged, at least, to follow the caustic; on the contrary, they will yield as readily to the usual remedies, as the swelling produced by suppressed gonorrhœa from the improper use of injections.

The lunar caustic applied for the removal of strictures, has been charged with producing incurable fistulous sores in the perinæum and urethra, and mor-

tification of the prostate gland and neighbouring parts, “in every instance speedily proving fatal.” Such dreadful accidents may possibly have sometimes happened in the hands of the practitioners of the sixteenth and seventeenth century, from the rudeness and unskilfulness of their method of treatment; but certainly it may be asserted with confidence, that none such have ever been known to happen from the present mode of applying the caustic, since the revival of the practice by Mr Hunter. In the extensive practice of Mr Hunter and Mr Home, as well as of others, no such misfortunes were ever met with; nor do we find that in the application of this active remedy, they ever dreaded such distressing effects. Should such a degree of inflammation ever be excited by the use of caustic, as to produce abscess in the perinæum or urethra, the rashness or igno-

rance of the surgeon will, in almost every case, be to blame: but if it should happen, there is no room to apprehend that the cure of it will be more difficult than if it had been brought on by any other cause producing inflammation.

That a morbid state of the prostate gland has, at times, been mistaken for stricture of the urethra, is extremely probable. Upon a superficial view of the symptoms attending both diseases, they bear a great resemblance, as has already been shewn, but can never be mistaken the one for the other, unless from the want of a careful examination. It is very probable, that such mistakes frequently did occur prior to the days of Daran and Astruc; and repeated applications of caustic substances to this gland, already in a morbid condition, would certainly hurry it into a state of more

active inflammation. Strictures, as already mentioned, are never formed deeper than just behind the bulbous part of the urethra; therefore, when a bougie meets with resistance deeper than this, an enlargement of the prostate gland may be suspected, the presence of which can be most readily discovered by an examination with the finger in ano.

Besides the objections enumerated above to the use of caustic for the cure of strictures, others have been advanced of a nature still more alarming. It has been accused, "in various instances, of completely destroying virility," and to have "excited such a tendency to inflammatory adhesion, that large parts of the canal of the urethra, nay, in some instances, the whole of it, is entirely closed up, and can never be opened again." Without inquiring

into those accidents which may have happened in ancient times, as already alluded to, it may certainly be affirmed, that none of so dreadful a nature as those just mentioned, have ever resulted from the employment of the caustic by Mr Hunter, or by other practitioners after him; nor is it almost possible to conceive how they can take place. Indeed, very little consideration would lead us to conclude that the very reverse, in some measure, should be looked for; and, accordingly, we find cases enumerated by Mr Home, where strictures had been a cause of barrenness in different married men, who afterwards had children, upon the strictures being removed by caustic. Of all objections to the practice, therefore, the last enumerated certainly have the least foundation in what actually does take place, or is ever likely to happen

from the use of lunar caustic in strictures.

It is also objected to the use of caustic, that strictures cured by it are very apt to return, when they are said to become more difficult of cure. Upon similar grounds, objections may be urged against lithotomy as well as some other operations. If strictures be effectually removed by the use of caustic, there is very little risk of any return, especially if the precautions to be afterwards mentioned, be carefully attended to. But when a return of the complaint does take place, which certainly may happen, no greater difficulty will be experienced in again removing it than at first. One case fell under my observation lately, where an opportunity occurred of examining the urethra of a gentleman, cured by me some years ago of very bad

strictures, by means of the lunar caustic. Dr Monro, junior, minutely examined the whole canal, where no morbid or unnatural appearance was met with, except a very slight, and scarcely perceptible degree of thickening of the membrane, at those points where the obstructions had formed.

From a fair and impartial consideration, then, of this subject, the following conclusions may be drawn : that cases of stricture will very frequently occur, where the common bougie, even when it can be made to pass the obstruction, will not effect a permanent cure, although, by being long employed, it may produce considerable dilatation ; but that the contraction will soon return after discontinuing the use of the instrument, especially if the patient return to irregular habits of life : that in such cases a

radical removal of the stricture may in general be expected from the employment of caustic applications, which, if used with due caution, will seldom or never be found to excite either troublesome or dangerous symptoms. Therefore, it may very reasonably be inferred, that this method of treating strictures will gain that ground which it seems to merit, notwithstanding the opposition it may meet with from many respectable surgeons.

OF STRICTURES

Of all the methods that have been suggested for the application of this active remedy, since the revival of its use by Mr Hunter, that proposed by Mr Home is, upon the whole, perhaps the best. In this way, a cylindrical piece of lunar caustic is nicely inclosed in the end of a common bougie, and so sunk into it, that the sides of the urethra may not be injured in passing it down to the stricture. Bougies thus armed with caustic, should be kept of different sizes, and every surgeon should prepare them for himself, by which means, if he do so with care, every risk will be avoided of the caustic being loosened and left in the urethra, an accident which appears to have happened to others besides Mr Home.

The method of applying lunar caustic to strictures, recommended by Mr Whately, seems exceptionable, on account of the smallness of the bougies necessary to be used where they are to pass within the stricture, since there must ever be considerable risk of their bending in the urethra before reaching the obstruction. Mr Whately himself seems sensible of this, and in speaking of the chance of it happening, he adds, “that the success of applying the caustic by this method, will depend upon the nice manner in which it is performed.”

Mr Sherwin has recommended what he considers an improvement upon Mr Home's method of applying caustic. He advises whalebone bougies to be made, with a small depression in the point, to the bottom of which a little

adhesive plaster, or any other viscous substance may be applied, after which it is to be lightly touched with a thin coat of powdered lunar caustic. One advantage from this method he supposes will be, that the operator will have it in his power to apply any precise quantity of caustic, from a quarter of a grain to a grain, without the smallest danger of a larger being disengaged. In the hands of a careful surgeon this instrument may perhaps be used with safety and advantage; but if introduced with rashness, especially if the urethra be very tender, which is often the case, the danger of laceration, and even of a false passage, appears very considerable.

Similar objections seem to apply to an instrument which has of late been a good deal recommended in the treatment of strictures, the flexible metallic

bougie, which in careful and cautious hands may also be frequently employed with advantage ; but in the hands of the unskilful or less cautious, is attended with considerable risk of doing mischief ; as, where the canal of the urethra is very tender, it may be readily pushed through it into the corpus spongiosum.

Before leaving this subject, it may be proper to mention a different kind of caustic from what is commonly employed, which has been lately introduced into practice by Mr Whately, the kali purum, or pure potass. Of the merits of this remedy I am unable to speak from experience. Mr Whately is high in its praise, giving it the preference decidedly over the lunar caustic, against which he takes an opportunity of advancing some charges, which, as far as my experience has enabled me to judge, ap-

pear unfounded and unjust. The method of applying this caustic is the following. A bougie of such a size as to enter the stricture is chosen, in the extremity of which a small hole is made about the sixteenth part of an inch deep, into which a portion of kali purum, or pure potass, less than half the size of the smallest pin's head, is introduced, and sunk below the margin of this hole, which is then contracted a little by the fingers, and filled up with hogs lard, to prevent the sides of the urethra from being injured when the bougie is passed to the stricture. The bougie, thus armed with the kali purum, is applied to the obstruction in a manner varying very little from the way in which the lunar caustic is used by Mr Whately. The point is kept in contact with the anterior part of the stricture for a few seconds, until the potass begins to dissolve.

It is then to be pushed gently forward within the stricture, about the eighth of an inch, and retained there for a second or two, and then to be carried forward till it has got through the stricture. It is almost unnecessary to enumerate objections to this method of treatment: some must be very apparent, such as the smallness of the bougie to be used; for this being readily bent, especially when retained for the shortest period in the warm urethra, it will always be doubtful whether we really do pass the point of it through the stricture in the exact manner directed by Mr Whately. From the very small portion of this substance directed to be used at a time, little inconvenience probably may arise, but to be applied with efficacy as a caustic, it appears to me to be very inferior in every respect to what is so generally employed, the lunar caustic.

THE success attending the use of the lunar caustic, and the time necessary for effecting the cure of strictures by means of it, will evidently depend very much upon the state of the obstructions. Where the disease is unattended with any morbid condition of the surrounding parts, and is simply a doubling of the membrane of the urethra, with the intermediate cellular substance, (which, as already said, is by far the most common state of stricture), it may be affirmed with confidence, that a very few applications of caustic will, for the most part, be sufficient for its removal. On the contrary, where the surrounding parts have become thickened and diseased, and where the obstruction is produced by a portion of the urethra of

some length being contracted and irregular, a speedy cure is not to be looked for, and the disease may even baffle all attempts to remove it. Upon this subject Mr Hunter has the following remark: "Most of the strictures I ever
" examined after death, appeared to be
" in the power of such treatment," (namely, by the lunar caustic), "however, I have seen one or two cases
" where the contraction was of some
" length and irregular, which would have
" puzzled me if I had attempted the cure
" by the caustic; I should have been apt
" to suspect that I was making a new
" passage by my gaining ground, and
" yet not relieving the patient by the
" removal of the symptoms."

Although, therefore, the cure of strictures by means of lunar caustic, in cases favourable for its operation, is generally

expeditious, yet, occasionally, the progress in removing these obstructions is slow and tedious beyond every expectation ; it will, therefore, be at all times prudent, not to promise too much to the patient, because, if he has been amused with the hopes of speedy relief, and is disappointed, in all probability he will not have that patience and perseverance which are sometimes necessary for accomplishing a cure. Every surgeon who has had any experience in this branch of practice, must have occasionally met with such cases of protracted cure. When this happens, it is probable the disease is in that state described by Mr Hunter as sometimes taking place, where
“ the urethra is irregularly contracted
“ for above an inch in length, owing to
“ its coats or internal membrane being
“ irregularly thickened, and forming a
“ winding canal.” These cases never

fail to occasion more or less embarrassment; because, if the surgeon appear to be gaining ground, while at the same time there is no alleviation of the symptoms of obstruction, suspicion is apt to arise that the point of the bougie has passed on the side of the stricture, and that an artificial passage is making. Where such suspicion takes place, it will be prudent to desist from the employment of the caustic; and when the tenderness induced in the part is gone off, and the urethra admits of a free examination, we should endeavour again carefully to ascertain the exact state of the stricture, in doing which, the cautious introduction of a sound, passing the finger at the same time into the rectum, will frequently be of much service. When the contrary happens in these cases of tedious cure, namely, when the symptoms of obstruction seem gradually

to yield as we gain ground, there is every encouragement to persevere, and to hope that ultimately a complete cure will be obtained. Some remarkable cases of this kind are particularly detailed by Mr Home.

From the observations of Mr Home, it appears that strictures sometimes become ligamentous; and he has even found them in a cartilaginous state. It is evident that in such cases, if a cure can be accomplished, it must be by means of the lunar caustic, which will be very slow in its effects; and in its employment there will be no inconsiderable risk of producing a false passage by the side of the strictured portion of the urethra.

This uncertainty with regard to the time necessary for accomplishing the

cure of strictures, did not escape Mr Sharpe: He says, "with regard to the
"length of time necessary for the cure
"of these disorders, it will be often im-
"prudent to make any positive prognos-
"tic, for there are not only desperate
"cases, to all appearance, which are re-
"lieved in a few weeks," (by the em-
ployment of the common bougie, it may
be observed), "but there are also seem-
"ingly slight obstructions, which do
"not yield for many weeks or months."

When a stricture is removed by the caustic, a bougie may commonly be passed on with ease to the bladder; but, according to the late Mr Hunter, this does not always happen. All the symptoms of obstruction may cease, the stream of urine may become free and full, the power of retention in the bladder may return, the symptoms of spasm may dis-

appear, and yet a bougie of ordinary size cannot be made to pass. Mr Hunter apprehends this to arise from the caustic not having destroyed the stricture in a direct line with the urethra, so that a bougie cannot catch the sound urethra beyond. "But this," he adds, "appears to me of little consequence, "as it is as much in the power of the "bougie to prevent a return at this "part, as if it passed on to the bladder; "for, if the water flows readily, it is "certain that the caustic has gone beyond the stricture, although it may "not be in a direct line, and that the "only risk of a return of obstruction "will be at the old stricture; but as a "bougie can now pass beyond that part, "it does as much good as if it passed "into the bladder; for I have known "several cases where the bougie appeared to have the same effect, as if it had

“passed on to the bladder.” Perhaps this circumstance which Mr Hunter thus notices, may have arisen chiefly from the method which he first employed for applying the caustic, which was attached to a probe, and passed down to the stricture, through a silver canula previously introduced. In this way, Mr Home observes, that either the side of the urethra was liable to be injured, or the stricture was destroyed obliquely, and a bougie could not readily be passed. But this objection is considered to be completely obviated by the improved method of applying the caustic inserted into the end of a common bougie of a proper size, by which it comes in contact with the centre of the obstruction, and no risk is incurred, if judiciously employed, of injuring the sides of the urethra in the passing of it.

WHERE the mode of treatment by caustic is considered adviseable, the first care is to ascertain accurately the real condition of the stricture; how far it appears simple and unconnected with any morbid affection of the surrounding parts; and, in general, if in a state favourable for the use of this active remedy. Should the state of the stricture be thus found favourable for the employment of caustic, the first step to be taken is to pass down a common bougie to the obstruction, of such a size as the urethra will admit without any difficulty. Having allowed this to remain for a few seconds, until any spasm excited at the time has subsided, it is then to be withdrawn, and the bougie armed with caustic introduced. This latter instrument

should be of a size rather smaller than the one withdrawn ; it should be passed expeditiously, but not roughly, down to the stricture, and steadily retained in contact with it for one, two, three, or more minutes, unless very acute pain be immediately excited, which does sometimes happen, in which case it should be withdrawn sooner. Sometimes a dread of the caustic excites such strong spasm at the moment, as to resist powerfully the passage of the bougie through the urethra : where this happens, the attempt must be desisted from for the time. This impediment to the application of caustic is often very troublesome, and therefore to obviate it by the prevention of spasm, as was before directed, it will sometimes be adviseable to administer an opiate an hour or two previously to the introduction of the bougie ; or the patient may sit with ad-

vantage over the steam of hot water. Upon withdrawing the armed bougie, directions are sometimes given to the patient to make water, with a view to wash off the superfluous caustic. This may be proper, if the natural desire takes place at the time, and the bladder is pretty full; but all straining for such a purpose, especially if the quantity of urine be small, ought to be avoided. In general, any pain excited by the caustic subsides in a very short time, and the patient should be directed to remain at rest until the uneasiness produced has gone off.

The frequency of repetition of the caustic application should depend much upon circumstances. Where little trouble is experienced, or pain excited, it certainly may be applied, as directed by Mr Home, every second or third day.

But where considerable hæmorrhagy takes place, and symptoms of much irritation are produced, with any degree or sense of fullness in the perinæum, all these should be allowed to subside before a renewal of the application; and if such symptoms threaten to be troublesome, it will be proper to recommend rest, opiates, fomentations, or the warm bath, and such other remedies as will obviate them.

The number of applications necessary for removing a stricture is extremely uncertain, and this may be accounted for readily, when we reflect upon the different state in which these obstructions are found. It was before observed, that some cases will yield to a very few applications, whilst others, apparently as favourable for a speedy cure, will resist the most careful and diligent use of the

remedy for many weeks, and even months, yet in the end be completely removed.

When there is reason to think the obstruction nearly destroyed, it may be proper, from time to time, during the application of the instrument, to employ an increased degree of pressure against it, when it will probably give way, and the bougie will pass through. But for this purpose too much force should not be used, nor too large bougies employed, otherwise much unnecessary pain, laceration, and risk of hæmorrhagy, may be induced.

WHERE stricture of the urethra has been of long standing, (and such will

chiefly be found fit cases for the use of the caustic), it will seldom happen that there are not more than one. These must be destroyed one after the other.

When a pretty full sized bougie passes freely to the bladder, the cure may be considered as effected, and nothing remains but to introduce a proper sized common bougie, from time to time, at least once or twice a-week, for a month or more, as a precaution against a return of obstruction; but the surgeon ought to be particularly careful not to be too anxious in deciding the cure to be complete. In cases where strictures return, this very often happens from the fault of the surgeon, who ought not to desist from the use of the caustic until the obstructed portion of the urethra is brought completely to its natural diameter.

THE proper application of the armed bougie is an operation, although simple, requiring some degree of dexterity, which is only to be acquired by experience. The principal object is to guard against any unnecessary violence or injury to the sound urethra, in passing the caustic down to the obstruction.

Previously to the employment of the caustic, it is essentially necessary to ascertain with exactness, at what distance from the external orifice of the urethra the stricture has been formed. This can only be done by a careful examination with the common bougie; and in making such an examination, it will often be satisfactory to employ a bougie of very soft consistence, by which means

a more accurate idea of the exact state of the stricture will be acquired, from this soft bougie taking on an impression from the obstruction, if kept in contact with it for a little time.

It will be proper here to observe, that when a bougie of a large size is used, its point is very apt to be caught and obstructed at the bend of the urethra, and in this way a suspicion of stricture may arise without any foundation. To avoid this, it will frequently be of much advantage to guide the point of the instrument with the finger along the perinæum, pressing it gently upwards. But at all times where the bougie to be introduced is so large and rigid, as not readily to take the shape of the urethra in passing, it ought to be bent so as nearly to resemble the figure of the common cathe-

ter. The armed bougie should also have this form, by which means the caustic will be applied with much more certainty to the centre of the obstruction.

ALTHOUGH the lunar caustic may often be applied in the manner that has been stated, to strictures of the urethra, without exciting any particular inconvenience or trouble, it is not to be expected, but that the application of a remedy so active, to an organ so delicate, will sometimes give rise to disagreeable symptoms: and, accordingly, during the employment of it, various circumstances will frequently occur, which, although they by no means seem to warrant a condemnation of the practice, are often embarrassing, and sometimes retard our progress, or even disappoint our hopes of a cure.

At first sight, it will very generally be imagined, that the pain attending such a method of cure will be extremely acute, and from the dread of this few are free, previously to an actual trial of the application. It must be owned, the pain produced is occasionally very severe; but more commonly this is not the case, and, until well acquainted with this branch of practice, the surgeon is not unusually surprised at the little uneasiness in general produced. The degree of pain likely to be occasioned by the application of caustic, will depend greatly, of course, on the degree of inflammation and tenderness in the urethra at the time. Where these are considerable, it will be proper to defer the employment of the caustic until they are removed or abated. This will best be done by light diet, rest, opiates, opiate injections, cooling laxatives, and the warm bath.

However severe the pain may be occasionally which is excited by the caustic, it very seldom gives rise to such irritation as to produce suppression of urine, and is only likely to do so by being used improperly during the presence of considerable inflammation ; or in consequence of some great imprudence on the part of the patient when under the employment of the remedy. This symptom, however, may at times take place ; but we have already seen, that there appears no reason to apprehend more than a temporary degree of distress, and such as will readily yield to the free use of opiates, and particularly of opiate injections ; to fomentations, the warm bath, and similar means.

It is well known, that where the irritation of a stricture has produced swelled testicle, the passing of a bougie

has often given immediate relief. But the continued use of the common bougie for the purpose of dilating a stricture, very frequently does occasion swelled testicle. The same effect is alleged to take place from the use of the caustic. It has been already stated, that this seems a very rare occurrence. Should it at any time happen during the use of caustic in strictures, it will be proper for some time to desist from the remedy, and to employ the usual means for reducing swelling of the testicle, such as topical bleeding with leeches, rest, antiphlogistic regimen, cooling laxatives, and saturnine applications, with suspension of the parts.

One of the most troublesome circumstances occasionally accompanying the employment of caustic for the cure of strictures, and which is apt more or less

to be embarrassing to the surgeon, and to alarm the patient, is a profuse hæmorrhagy. The quantity of blood discharged is sometimes very considerable, and the hæmorrhagy may return from time to time, for some days. But whatever may be advanced to the contrary, nothing is ever to be apprehended from the quantity lost, except a temporary faintness and debility. If the discharge be not great, it may be beneficial by abating inflammation. Hæmorrhagy is most apt to happen when the seat of stricture has become very tender, and easily lacerated; and when the urethra is in this state, it will be found to take place as readily perhaps from the free use of the common bougie, as from the one armed with caustic. Although it be a troublesome and embarrassing occurrence, it may be remarked, that a cure

is for the most part effected much more quickly in such cases, than where the membrane of the urethra is more firm and less irritable. In this very tender and easily lacerated state of the urethra, it will be proper not to use a caustic bougie of so large a size as otherwise might be adviseable ; nor to apply so considerable a degree of pressure as an opposite condition of the stricture would admit of. When the discharge is more profuse than it ought to be, it may be moderated or checked by cold applications, rest, internal astringents, and an open state of the bowels. Gentle pressure in the perinæum will frequently put a stop to the evacuation, but this practice is disapproved of by Mr Home, from a dread of the blood passing back into the cavity of the bladder ; if attention, however, be given to make the pressure

from behind the stricture, forward, any risk of this kind will certainly be avoided. If necessary, I suppose some proper styptic application, such as a solution of alum, may be passed with freedom through the urethra to the part from whence the discharge takes place.

A regular paroxysm of fever sometimes follows the application of caustic to a stricture. The patient is seized with violent shivering, succeeded by heat and profuse sweating, after the continuance of which for several hours, all the symptoms of fever subside. It seems not easy to account satisfactorily for such an occurrence. Mr Home has found it chiefly to happen with those who have spent many years of their life in hot climates, where they have been subject to attacks of intermittent fever. The same gentle-

man's experience has led him to consider such a circumstance taking place, as very often a prelude to the stricture speedily giving way. The only treatment necessary is the administration of a smart purge, followed perhaps by a full dose of opium, exciting and keeping up a free perspiration by the use of warm diluent drinks.

WHERE the long continuance of strictures of the urethra has induced a considerable degree of morbid action in the coats of the bladder, or in other neighbouring parts, much benefit may be derived in restoring these to a more healthy condition, by a careful employ-

ment of those means which have been already recommended as likely to prove beneficial in diseases of the bladder and of the prostate gland.

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