

A practical treatise on the symptoms, causes, discrimination, and treatment of some of the most important complaints that affect the secretion and excretion of the urine : the whole exhibiting a comprehensive view of the various diseases of the kidneys, bladder, prostate gland, and urethra / by John Howship.

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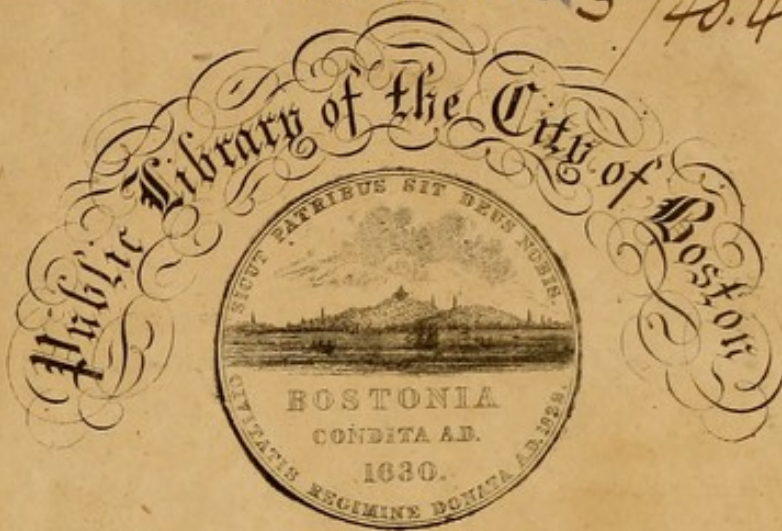


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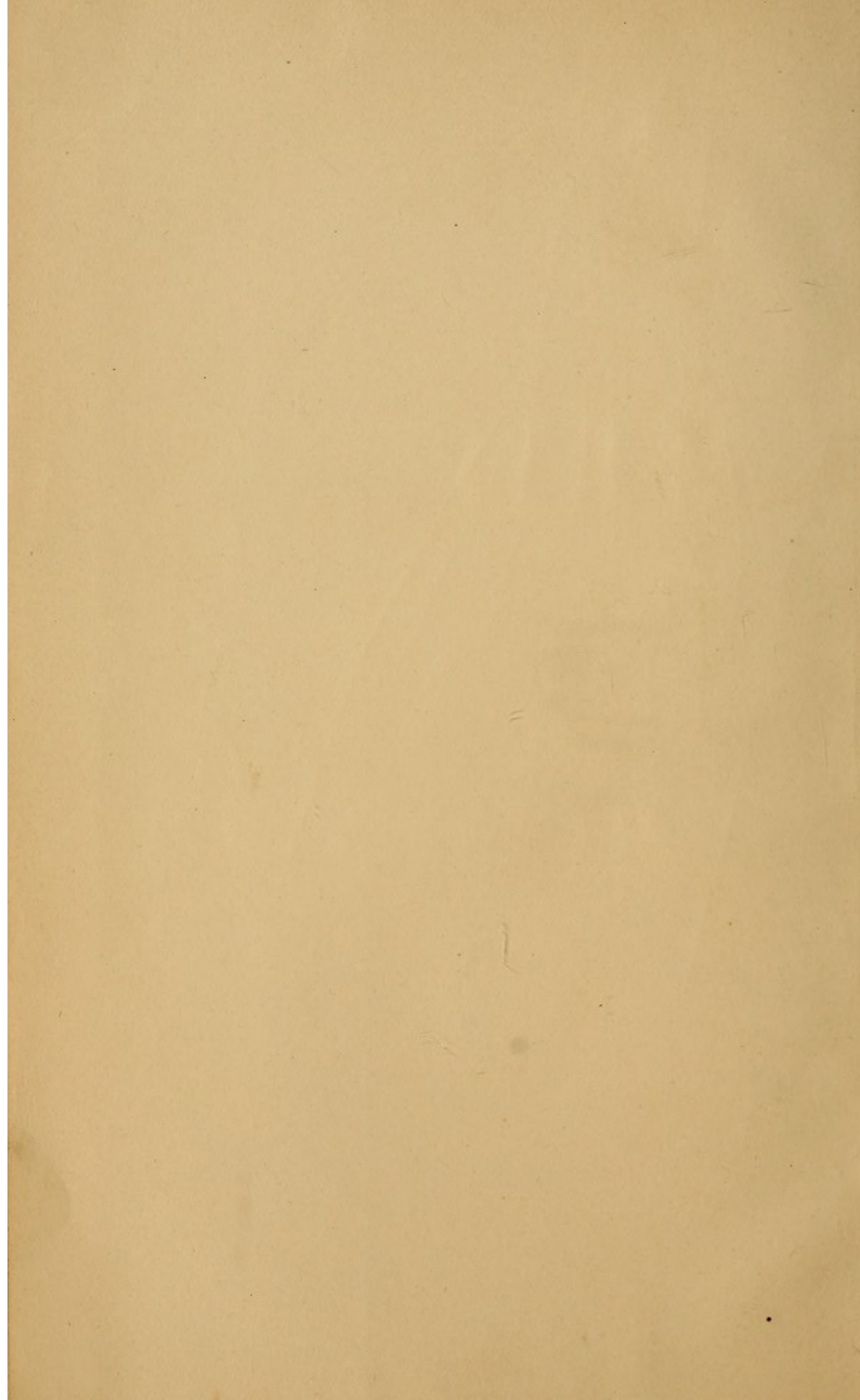
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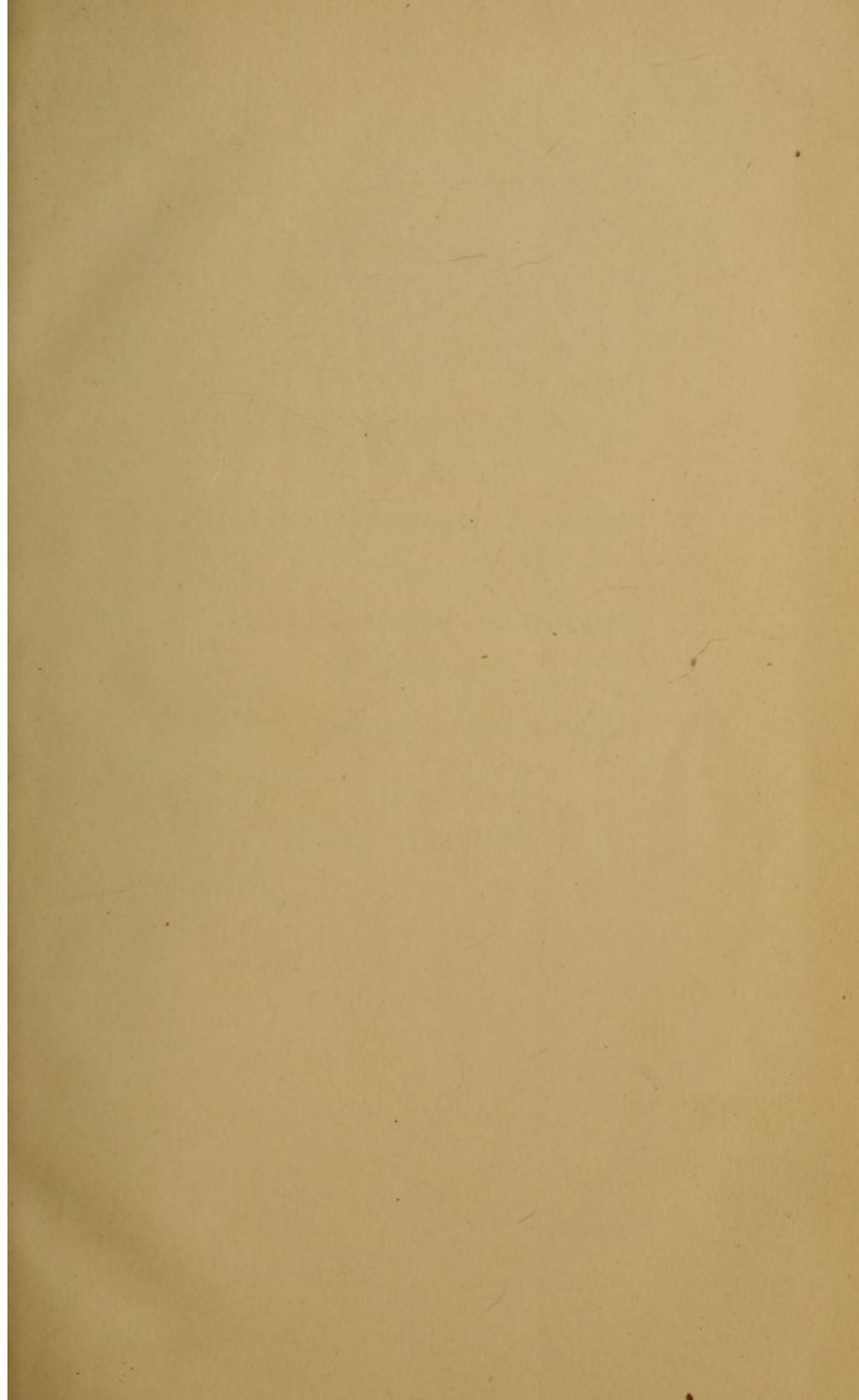
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SECTION AND EXHIBITION

THE GREAT CENTRAL EXHIBITION

A
PRACTICAL TREATISE
ON THE
SYMPTOMS, CAUSES, DISCRIMINATION, AND TREATMENT
OF SOME OF
THE MOST IMPORTANT COMPLAINTS
THAT AFFECT THE
SECRETION AND EXCRETION
OF
THE URINE.

THE URINE
OF
SECRETION AND EXCRETION
THE MOST IMPORTANT COMPLAINTS
OF THE
SYMPTOMS, CAUSES, AND TREATMENT
PRACTICAL TREATISE

LONDON:
Printed by A. & R. Spottiswoode,
New-Street-Square.

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OF SOME OF
THE MOST IMPORTANT COMPLAINTS
THAT AFFECT THE
SECRETION AND EXCRETION
OF
THE URINE.

THE FIRST HEAD, INCLUDING

Suppression; from Congestion, Inflammation, Calculi, Abscess, or other Diseases in the Kidneys; the Appearance of Blood, Pus, Albuminous Matter, or Gravel, in the Urine; and the various Kinds and Seats of Urinary Calculi.

THE SECOND, SPECIFYING

The Circumstances inducing Retention; in the Kidneys, Ureters, Bladder or Urethra; as Old Age, Paralysis, Gouty Spasm, Strangulated Rupture, Tumors in the Bladder, Hernia Vesicæ, Displacement or Pressure of other Viscera, Ruptured Bladder, Inflammation of Urethra, Gonorrhœa, Contusion, Tumors, Enlarged Prostate, Spasmodic, and Permanent Stricture: with Remarks on Puncture of the Bladder.

THE WHOLE EXHIBITING

A COMPREHENSIVE VIEW OF THE VARIOUS DISEASES
OF

THE KIDNEYS, BLADDER, PROSTATE GLAND, AND
URETHRA.

Illustrated by numerous Cases, and Engravings.

By JOHN HOWSHIP,

MEMBER OF THE ROYAL COLLEGE OF SURGEONS IN LONDON;
SOCIÉTÉ MÉDICALE D'ÉMULATION, OF PARIS; ROYAL MEDICAL SOCIETY OF
EDINBURGH; AND MEDICO-CHIRURGICAL SOCIETY IN LONDON;

AUTHOR OF

PRACTICAL OBSERVATIONS IN SURGERY AND MORBID ANATOMY,
OF PRACTICAL OBSERVATIONS UPON THE DISEASES OF THE LOWER INTESTINES,
&c. &c. &c.

LONDON:

PRINTED FOR LONGMAN, HURST, REES, ORME, AND BROWN,
PATERNOSTER-ROW.

1823.



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Aug 29/56

TO

JOHN HEAVISIDE, Esq.

F. R. S. F. A. S. &c. &c.

MY DEAR SIR,

UPON a former occasion I took the liberty of laying before you an Essay, the First Fruits of my professional experience; I hope and trust the work I now have the honor to present, not weighed in the balance of desert, but considered as a testimonial of respect, may be so fortunate as to obtain your acceptance and good opinion.

If the steady extension of the same line of unalterable friendship through every changing scene of life constitutes one of the strongest claims upon gratitude, and one of the

highest attributes of our nature; then does your still continuing kindness and regard which has now followed me through a long series of revolving seasons, call for such acknowledgements on my part as words would but ill express, and I am afraid deeds never can.

Believe me to remain,

Dear Sir,

Your sincere Friend, and

Faithful Servant,

JOHN HOWSHIP.

George Street, Hanover Square,

March 8. 1823.

INTRODUCTION.

IT is the object of the following work to bring into as clear and comprehensive a form as possible, the most interesting results of my own experience, occasionally aided by that of others, on the particular subject upon which it proposes to treat.

The disorders and diseases that regard the secretion and excretion of the urine, form an extensive line, or rather I had almost said a complete circle, of pathological research; the various parts of which, as regards the whole, it has been my anxious desire to place in that point of view best calculated to give a clear, and at the same time a correct, impression.

The diseases that relate to the system of the urinary organs were formerly too much neglected. Feelings of false delicacy in some instances prevented their being made the subject of complaint in their commencement, and not unfrequently operated as a motive to concealment through their progress; and if the means of studying these diseases at the bedside have been scantily supplied, those facilities by which the state of the parts might have been determined by examination after death, have also been either unobtained or unregarded. So little, in fact, have these complaints, till of late, been understood, that when in rare instances the morbid anatomy has been ascertained, the conjectures as to the causes of the diseased appearances have been scarcely consistent either with reason or probability.

The late Mr. HUNTER furnished one of the brightest examples ever known of what may sometimes be accomplished in the short span of a single life, by the union of unparalleled industry, a strong genius, and an ardent love of his profession. His observations upon the diseases of the bladder and urethra may be considered as the principal foundation on which our knowledge of these complaints at present stands.

The practical observations of Sir E. HOME upon the treatment of stricture in the urethra, is also an excellent work ; including the consideration of the remote as well as immediate circumstances connected with stricture. To the same author the professional world is indebted for observations upon the diseases of the prostate gland ; diseases never before treated in this country with so much perspicuity.

The practical work, however, of M. DESAULT, "*Sur les Maladies des Voies Urinaires*," appears to me in some respects superior to any that I have seen, especially in what relates to the mode of dividing and arranging the subject ; upon which account the present work is constructed in most respects on a similar plan.

To explain my reasons for having passed over certain divisions included in the arrangement of M. DESAULT, would be tedious and uninteresting ; suffice it to say, I have freely followed wherever my judgment approved, and as freely dissented where doubt or difference of opinion suggested the propriety of my so doing. I trust, however, that this dissent has upon every occasion been expressed in terms consistent with the respect due to the memory of those whom superior talent has raised into high and deserved celebrity.

The observations adduced, and the practical rules grounded upon them, have been derived almost exclusively from my own experience in these diseases, although where I have found apposite remarks, or interesting facts, in the course of my reading, or through the kind attention of friends, I have not hesitated to avail myself of them.

In the development of morbid structure, care has been taken to specify what I have myself examined, and what has been advanced upon the authority of others. A care particularly necessary in circumstances that regard the leading principles of pathology, where error is so apt to creep in, and where loose conjecture, through the medium of generally received opinion, has sometimes assumed all the importance of truth.

For many of the pathological illustrations I am indebted to the kindness of Mr. HEAVISIDE, from the valuable contents of whose extensive Museum it will be seen I have derived much information. Neither have I been under less obligation to the friendship of Dr. HOOPER, from whose spirit of liberality any labours that have improvement for their object, are sure to derive not only approbation but support. Many curious illustrations of disease have been drawn from the splendid collection in the Museum of the Royal College of Surgeons. Some fine specimens of disease in the urethra I also found in visiting the Military Collection at Chatham; a collection which upon many accounts does honour to its founder, the present Director-general. That active spirit of research, and patronage of improvement in pathological science, the want of which so long retarded the advancement of military surgery, has at length manifested itself; and by inculcating the judicious

and important precept that individual effort may in almost every case be rendered conducive to general benefit, promises to operate most favourably upon the medical officers of the army; by exciting a laudable emulation, that formerly could scarcely be said to have had an object, but which in the present day will be looked up to and properly regarded, as constituting the strongest claim to distinction and honour.

With relation especially to the pathology of the kidney, I have met with some most interesting preparations in the Museum of Mr. BROOKES, surgeon and teacher of anatomy; a collection that could only have been made by one whose personal industry, and professional zeal, know no intermission.

The particular histories of disease or cases, may at the first glance perhaps, appear not sufficiently select; the reading them through with the attention necessary to render them useful, may be considered tedious. I have however, very long been convinced that the variety in the association of symptoms is almost infinite, the least change in the position of any one altering in some degree the aspect of all the rest; and that the honest student of surgery can never become the successful candidate for fame and fortune, without consenting to devote much time and patience, more labour and care, and occasionally the sacrifice of almost every comfort, to the acquirement of knowledge in his profession. These opinions must plead, as I trust they will plead, my apology; and indeed the weight of these points in regard to symptoms, cannot be better expressed than they have been in reference to words, by the great Dr. JOHNSON; who, in the Preface to his incomparable Dictionary,

observes, "That those quotations, which to careless or unskilful perusers appear only to repeat the same sense, will often exhibit, to a more accurate examiner, diversities of signification, or at least afford different shades of the same meaning: an ambiguous sentence is ascertained by a passage clear and determinate, and the word how often soever repeated, appears with new associates, and in different combinations."

For those minor defects, which most probably have escaped notice, I beg leave to hope I shall stand excused; in consideration of circumstances, which as they are common to every professional life, it would be affectation to specify. The great object of all attempts of this kind is or ought to be of a serious nature, the earnest and laudable purpose of lightening the burthen of those afflictions which suffering human nature is but too often called upon to support. Consistent with this feeling, my single anxiety has been the practical and therefore useful illustration of my subject; and I shall feel most amply rewarded, should I find my labours in this particular held conducive, in any degree, to the advancement and improvement of our most useful profession.

ERRATA.

Page 57. line 1. for *fungous*, read *fungus*.

59. line 9. for (270.) read (370.)

68. line 7. for *more*, read *most*.

214. line 27. for (111.) read (211.)

302. foot-note, for PLATE II. *Fig. 3.* read PLATE II. *Fig. 4.*

PLATE I.

Fig. 2.

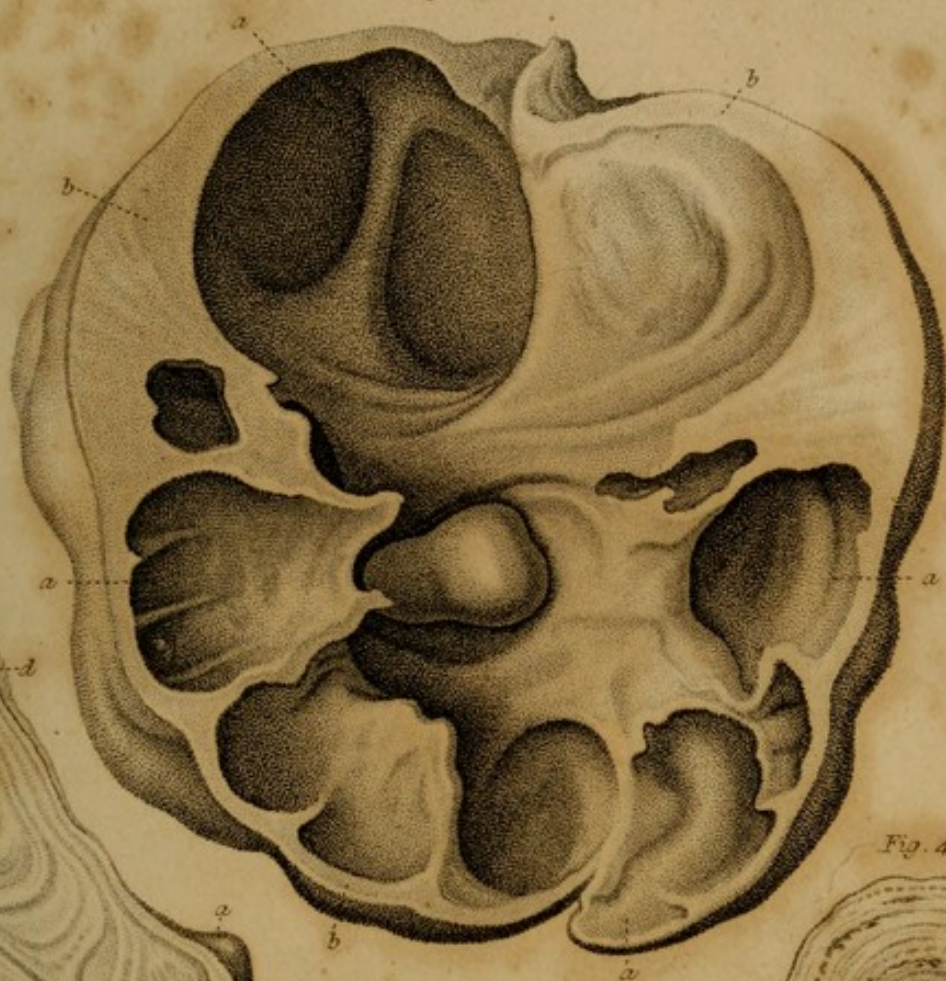


Fig. 1.



Fig. 4.



Fig. 3.





PLATE II..

Fig. 1.

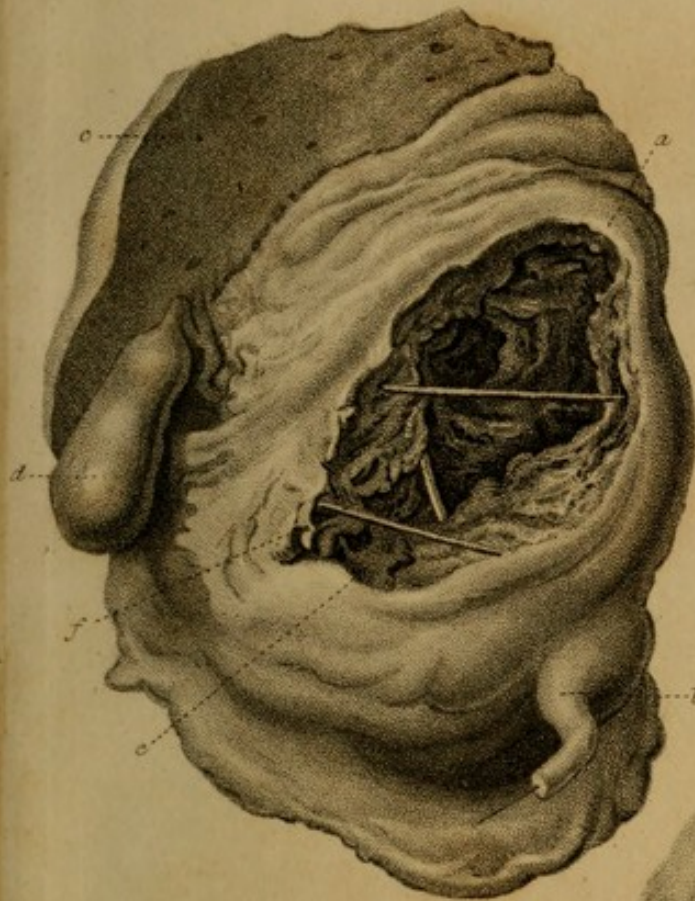


Fig. 3.

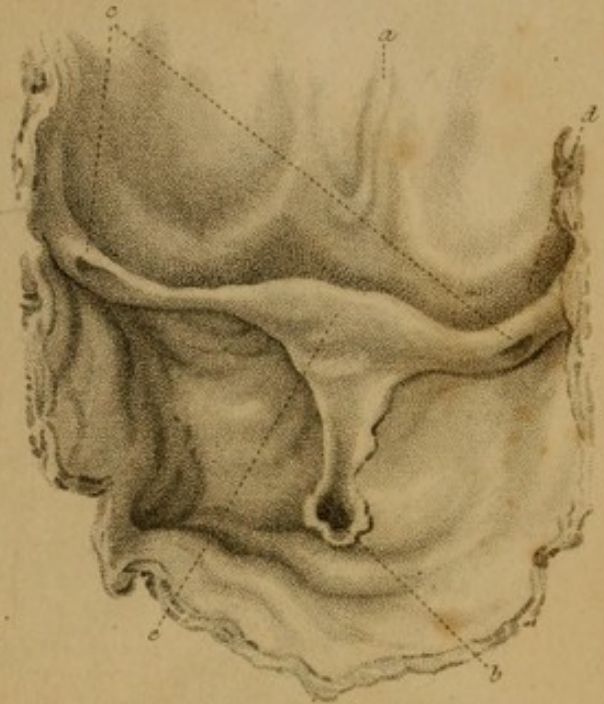


Fig. 2.



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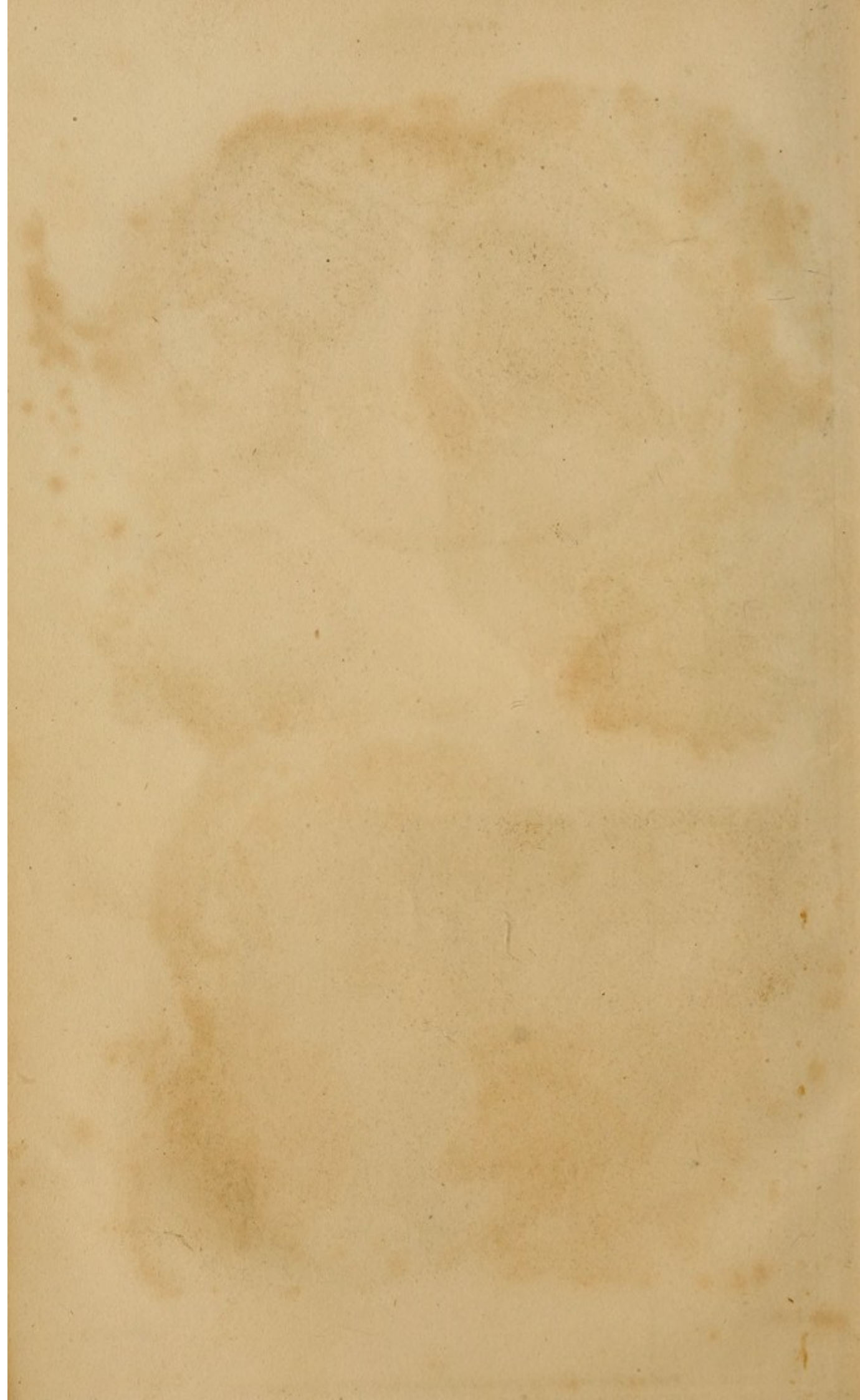


PLATE III.

Fig. 3.

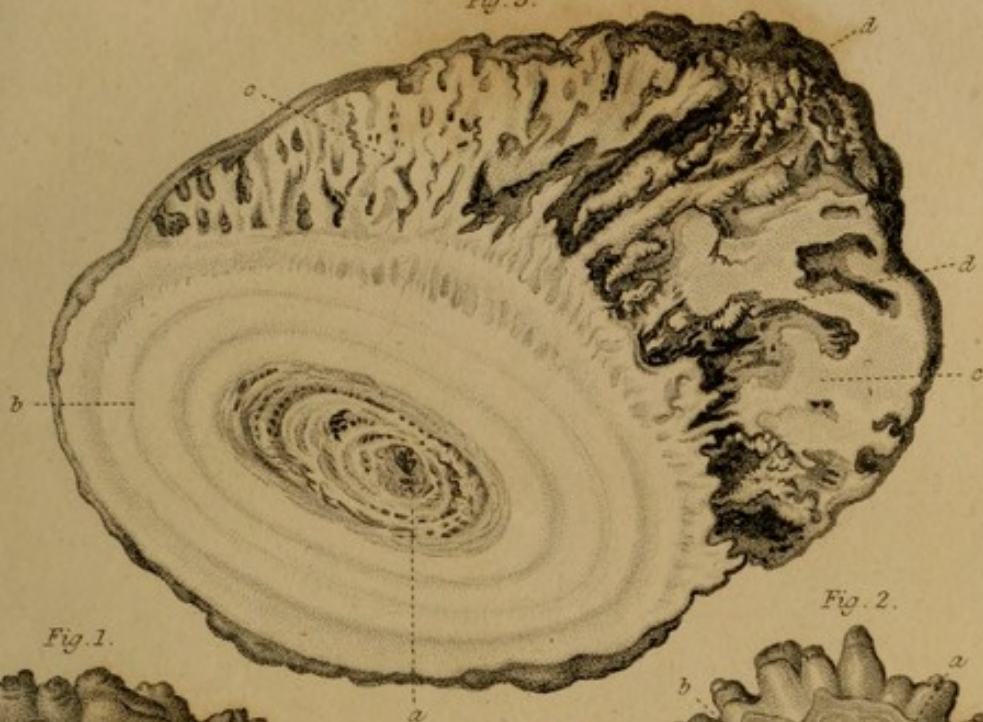


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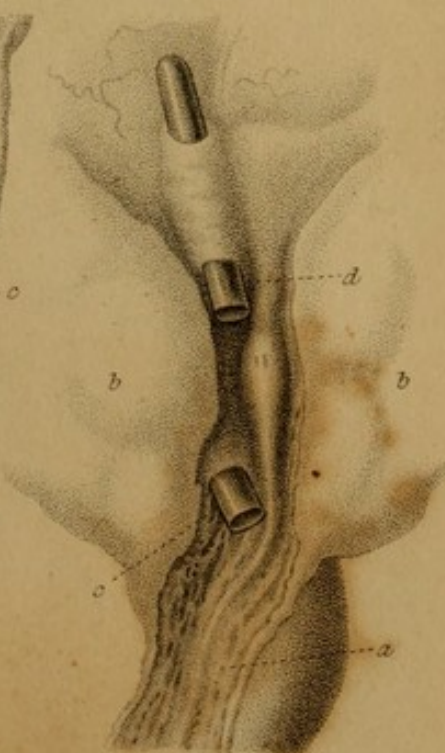
Fig. 2.



Fig. 5.



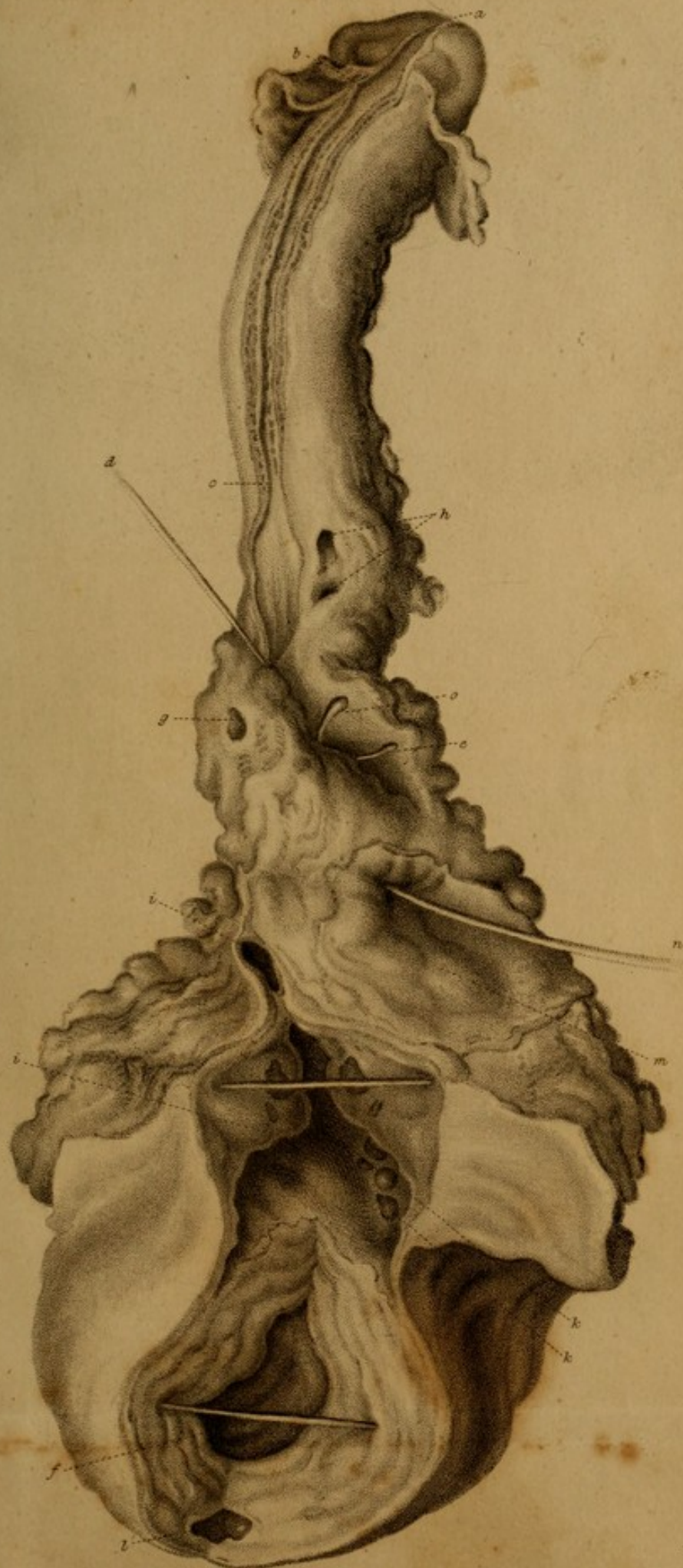
Fig. 4.



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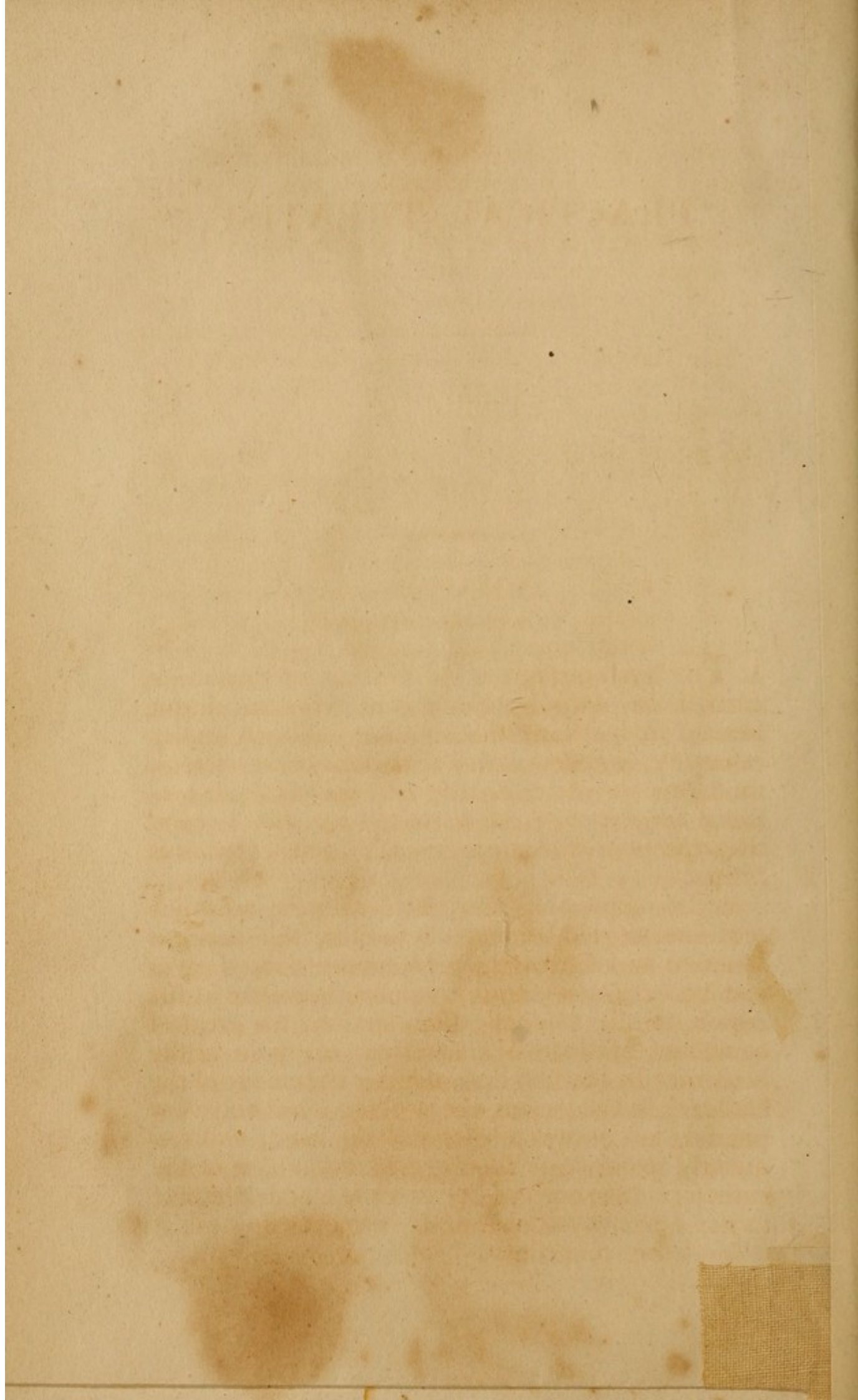
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A

PRACTICAL TREATISE,

&c.

PART I.

ON THE DISEASES THAT AFFECT THE SECRETION OF
URINE.

CHAP. I.

ON SUPPRESSION OF URINE.

1. **T**HE functions of the kidneys in secreting urine, carried on with constancy and freedom during health, under some diseases are liable to embarrassment, from obstruction to the flow of the secreted fluid; under others, occasionally subject to suspension; the first of these states giving rise to retention, the second to suppression, or non-secretion of urine.

2. In suppression, there is usually no sensation of desire to void urine; in retention, this desire is frequent and distressing. In suppression, there is commonly much pain in the loins, but none in the region of the bladder; in retention, the greatest complaint of distress arises from the pain in the bladder. In the first case, there is no tumour of the bladder; in the second, the swelling is not only very painful, but always manifest to the hand, and frequently to the eye. Lastly, the introduction of the catheter, in the one case, proves the bladder empty; in the other, by allowing the urine to flow off, it relieves the complaint.

B

3. The urine may, however, be prevented reaching the bladder, without any suspension of action in the kidneys; this may happen from any cause impeding, or obstructing, the flow of water into, or through, the ureters. In these cases, the attendant symptoms must be more particularly considered, in ascertaining the seat, and determining the cause, of the affection.

4. Suppression of urine may be complete, or incomplete. The first case is very rare; the second comparatively frequent. An affection that either deranges or destroys the functions of one kidney, may leave the other to the more vigorous performance of its duty; a circumstance most happily calculated to guard the constitution from the ill effects of a disease, the complete establishment of which is almost invariably fatal. (62.) HALLER says, "BOERHAAVIUS perswasus est, ex multis observationibus, suppressionem perfectam urinæ mortiferam esse." *

5. Local congestion, inflammation, calculi, and abscess, may perhaps be considered the most clearly ascertained, and most frequent occasional causes of suppression of urine; although the precise mode, even of their operation, appears to be almost entirely unknown.

6. In some instances, the neglecting to empty the bladder has brought on suppression of urine. An example of this is mentioned by BOERHAAVE, in a gentleman who, from close attention to business, neglecting to pass his water, at length lost the power, and it was therefore drawn off by the catheter. On the third day after, the catheter being passed as usual, the bladder was found empty. On the fourteenth day he died. The symptoms on the sixth day, were inaptitude for conversation, sleepiness overpowering but unrestful, offensive breath

* Prælectiones Academicæ, edit. ALB. HALLER.

and perspiration; quickened pulse, convulsion, lethargy, and death. He adds, "*In cerebri ventriculis reperta est urina.*"* The secretion of urine, in one case, mentioned by Dr. HENRY, was for two days entirely suspended, by an excessive dose of foxglove.†

7. Suppression of urine is generally attended with feverish symptoms, thirst, and a urinous taste in the mouth. Frequent vomiting also is a characteristic symptom, where the complaint continues; the fluid rejected having a peculiar urinous odour. DESAULT observes, "*Il est vrai que la nature prévient quelquefois les accidens ou retarde leur naissance, en se débarrassant en partie des urines par d'autres émonctoires, tel que la peau, les oreilles, les narines, la bouche, les mamelles, l'anús, &c.;*" and as regards particular instances, there is every reason to believe his statement correct. Such, indeed, is the diversity of appearances in this disease, that Dr. ABERCROMBIE, in a valuable paper upon this subject, remarks that the only constant circumstance is the suspension of secretion.

8. Mention is made by Dr. JOHNSTONE, of a very curious fact, in a case of suppression, in which, "for some days before death, the skin was all over as white as if it had been powdered. This white dust being gathered, it was found to have the taste of crude sal ammoniac." The mode in which this was explained, was "the secretion of urine prevented, the perspirable matter became so supersaturated with ammoniacal salt, that it crystallized upon the skin."‡ But the most singular instance upon record, perhaps, is related by Dr. DAWSON, of a woman, in St. George's Hospital. Her complaints were various and severe, and with other

* *Prælec. Academicæ.*

† *Edinb. Med. Journal.* vol. vii.

‡ *Lond. Med. Commentaries,* vol. v.

symptoms, after several temporary attacks, came on a permanent suspension of all action in the kidneys, and she is stated to have had a total suppression of urine for above fifteen months. During this period, she frequently vomited every day, sometimes every two or three days. If the vomiting came on after eating, what was rejected seemed to be mere urine, without any mixture of what had been taken. By occasional purges and other means, œdematous swellings of the limbs were kept under. Her breasts became ailing, and discharged a watery fluid, which, like the other discharges, had a urinous smell. At length uncommon pricking pains were felt all down the back and loins, and about the belly and groin, with great heat. On the second day she voided three ounces of thick slimy matter, with sharp pains in the urinary passages; this water was not high coloured. The next day she passed healthy urine. Afterward she often had a suppression of urine ten or fourteen days, and once for two months, during which she had no vomitings; but her body was very much swelled.* In such complaints as these, treatment cannot with propriety be directed upon any one general principle; it must be regulated by the circumstances of the case, and will frequently require to be adjusted by its varying phenomena. In the following sections, however, some suggestions upon this head will be laid down. It is occasionally not only difficult, but impossible to determine positively, whether this disease exists or not. (Case 9.)

SECT. I.

Suppression, from Congestion in the Blood-vessels of the Kidneys.

9. THE quantity of urine secreted, is subject to great variation, from the influence of temporary

* Philos. Transact. vol. li.

circumstances; profuse sweating, excessive salivation, obstinate diarrhœa, dropsy; M. DESAULT says, “ l'épaississement du sang,” is an occasional cause.

10. Congestion, or local plethora, in the circulating system of the kidneys, I should suppose, sometimes to operate as a cause of suppression; from external injury to the loins, bruising the structure, and enfeebling the functions, of these glands. The first consequence of injury to the kidneys may be voiding blood with the urine; indeed, hæmorrhage may thus occasionally form the leading character of the complaint. (Case 11.)

11. Suppression of urine has in particular instances been presumed to arise from obstruction to the flow of fluid from the secreting tubes, either by inspissated mucus, pus, or worms. The agency of such causes as these, however, is matter of speculation only; and even could their existence be known, there appears but little chance of deriving any practical advantage from the information; for my own part, I have, in some instances, found the natural structure of the kidney so completely altered, and in fact destroyed, by long-continued pressure, as to suggest a doubt whether suppression ever arises from this cause. (546.)

12. In the treatment of this complaint, the state of constitution on the one hand, and the position and circumstances of the case on the other, must be our direction. Bleeding, either general or local, will be commonly required, unless the pulse and strength are deficient. In the plethoric habit, the volume of the circulating blood may be considerably lessened, with advantage, by opening a vein in the arm. Should, however, the propriety of the measure be at all doubtful, the complaint may, perhaps, be relieved by the application of leeches, or cupping-glasses: of these means, the former is the most quiet in its operation, the latter the quickest and best, where decision is necessary.

13. Frequently the symptoms originating in congestion, will run more or less distinctly into those of inflammatory action. Under these circumstances, the treatment must be directed according to the rules laid down in the next section.

14. The bowels will, in every case, require attention; active purgatives, however, have been sometimes held objectionable; although they appear rarely to do harm. Occasional emetics, also, are recommended, especially by french writers; but, perhaps, it is only in a few cases that they answer. I have been more than once called to attacks of this description, in which the low state of the pulse, and still lower condition of the physical powers, required, from the first, every attention to the improvement of the digestive organs, aided by nutritious diet, with a view to restore a broken constitution; and this partially accomplished, the appearance of blood in the urine has ceased, while the quantity of the natural secretion has increased, until it has, at length, returned to its healthy state, both as to quality and quantity.

CASE 1.

Partial Suppression of Urine, from Contusion of the Kidneys.

A MAN, 43 years of age, walking home on the evening of *February* 11. 1820, was pushed down among some timber, his left loins coming into violent contact with the sharp edge of the log. In considerable pain, he came home, and went to bed. In four hours he passed urine, but in small quantity, mixed with blood, small coagula subsiding to the bottom. I visited him the next day, and as he complained of a very scanty secretion of urine, tenderness and pain in the kidney, a sense of numbness down the thigh, with confined bowels; he was ordered an aperient, to be frequently repeated.

February 13. Bowels relieved, pain not removed,

but sense of numbness increased. Pulse 90, not hard. Urine still small in quantity, and tinged with blood. Six leeches applied to the seat of the injury, and the aperient continued.

February 14. Pulse natural; tongue furred; urine gradually becoming clear and healthy: he now complained of desire to pass it every three or four hours, when only a table-spoonful was collected.

February 15. Ordered the warm-bath; greatly to the relief of the feverish symptoms, and local pains.

February 17. Thirst still considerable; tongue foul; pulse 90; bowels sufficiently open; some tenderness on pressure, in the seat of the kidney, and in the direction of the colon. A mixture was ordered, with saturated lemon-juice, camphor mixture, and compound sulphuric æther, every four hours.

February 18. Much better in every respect; tongue much cleaner, and moist at the sides; urine improved in quantity. He was directed the warm-bath for the fourth time; and desired to take an aperient medicine, in the intervals of his saline mixture.

March 8. Almost recovered, and able to be about again; but still in occasional pains in the side, with numbness down the thigh and leg, so that he feared eventual lameness. I desired him to keep his bowels carefully relaxed, and to apply a blister, to be kept open, upon the loins.

March 15. The blister had greatly relieved the pain, but had not diminished the numbness about the limb. The free and healthy secretion of urine appeared now to be perfectly restored.

April 8. The blister still discharging, all internal symptoms relieved, the pain and numbness entirely removed, leaving only an occasional sense of weakness. I advised his keeping the blister open another week, and then allowing it to heal.

May 2. He called, and said the pain in the loins, the numbness, and lameness in the thigh had returned. I advised another blister, to be kept open, on the seat of the pain.

May 23. The blister kept open three weeks, and then allowed to heal. He said he was thinking of leaving London, as the complaint was entirely removed; but he wished to know how to act if it returned again. I said, apply another blister, to be treated as before.

June 20. 1821. The bruised part again painful, with a sense of dull, heavy uneasiness, which he thought might have been consequent to his late close confinement to his employment, as a taylor. I therefore recommended another blister, to be kept open,

August 28. I accidentally met this man. He told me the last blister, kept open three weeks, had removed all pain and uneasiness; that when sitting close to work, he had felt a sense of fulness, and occasional shooting in the side, a dull, numbing pain down the thigh, and perceptible uneasiness, and even enlargement of the testicle on that side; but that when on foot, and in exercise, all this went off again, and he felt perfectly well.

SECT. II.

Suppression, from Inflammation of the Kidneys.

15. THE causes of suppression from inflammation of the kidneys, will be those of inflammation in general. Violent impressions from cold falling upon these parts; acrid and irritating medicines taken internally, cantharides, turpentine, &c.; irritation from calculi, in the bladder, ureters, or cavities of the kidneys, (Cases 3. and 4.); irritation from gouty matter disturbing the functions of these glands. Any of these causes may either first excite inflammation, and suppression, as its consequence, or without producing distinct inflam-

matory symptoms, may at once suspend the secretion of urine. Gouty action flying about in the constitution, is not a very unfrequent cause of partial suppression. A case of complete suppression from gout, terminated happily under Mr. HEAVISIDE's care; and was the only instance of recovery from complete suppression, he had ever seen. A general officer, walking home on a cold night, from the House of Commons, in full dress, with gout in his foot, the complaint left his toe, and the next day, Thursday, with great pain in the loins, he made little water, on Friday less, and on Saturday none. On *Sunday*, with Sir FRANCIS MILMAN, Mr. HEAVISIDE visited him: he felt the abdomen, but found no tumor; requested to draw off the urine; he passed a catheter, and found, as he expected, the bladder empty. Terebinthinate medicines were directed, and, on taking the third dose, the patient felt desire, and passed nearly a pint of water. Sent afterward down to drink the waters at Bath; he there had a regular fit of the gout, and perfectly recovered.

16. Within the last twelvemonth, I have had a painful opportunity of witnessing, with Dr. HOOPER, the effect of gout, moving from one part of the constitution to another. The joints of the extremities, and viscera of the body, were successively subjected to its influence; when the complaint left the lower limbs, constant uneasiness, and occasional sharp pains came on in the loins, with nausea and retching; the quantity of urine secreted, sinking at once down to one-eighth of its former quantity. For several days that these symptoms continued, the water passed scarcely amounted to a tea-cupful a day; but on the disorder again shifting its seat, these consequences ceased, and urine flowed again, two or three pints daily. I have seen several nearly similar instances. An interesting case of suppression has been published by Dr. LAING, of Fochabars, in which there seemed to be inflammatory

affection of the kidneys, from pain in the back, feverish symptoms, and sizzly blood, during the attack. The functions of the kidneys were entirely suspended for nine or ten days, without any material injury to the rest of the system; the only evident outlet, for that period, being the bowels, from which, by the aid of purgatives, copious watery stools were brought away. *

17. Nearly all the complaints to which the kidneys are subject, may be connected more or less distinctly with inflammatory action; and as the treatment required in inflammation must be taken into account in the management of every such affection, particular attention should always be paid to the symptoms indicating its presence.

18. A writer, who may be truly said to have studied from nature, observes, “ La douleur, dans tous ces cas, est ordinairement aiguë intermittente; on continue avec plus ou moins de rémission: on la rapporte aux lombes, et quelquefois à l'estomac; elle s'étend jusqu'à l'aîne, à la racine de la verge, & quelquefois aux testicules, qui en souffrent une rétraction: quelques-uns ont encore des engourdissemens à la cuisse. *Les urines s'arrêtent, ou coulent en très petite quantité*; on les rend souvent avec douleur: elles sont limpides pendant le paroxysme; mais elles deviennent à la fin bourbeuses et glaireuses, ou graveleuses. On a, pendant l'attaque, des nausées, le vomissement et le ventre resserré; sa durée est de quelques heures, d'un ou plusieurs jours; la fièvre l'accompagne le plus souvent; sa fin est annoncée par l'écoulement des urines, ou la sortie de quelque pierre.” † The deficient secretion of urine, being as distinctly pointed out by another eminent french writer, who says, “ L'inflammation des reins est presque toujours accompagnée de la suppression des urines ‡;” and, being certainly an attendant symptom in inflammation of

* Edinburgh Med. Journal. vol. x.

† LIEUTAND. Précis de la Méd. tom. ii.

‡ DESAULT.

the kidneys, it is singular that such excellent pathologists as Dr. CULLEN *, and Professor HOME †, should neither of them have noticed it.

19. The appearances, on examination after death, if notable, will be rarely confined to increased vascularity; more frequently presenting some stage or consequence of suppuration; these will be noticed in treating of the appearances from calculi lodged in the kidneys. (171.)

20. The treatment of inflammation of the kidneys, proceeds upon the same general principles that regulate the cure of other inflammatory affections; bleeding, warm-bath, mild purgatives, emollient clysters, and a free use of mild demulcent liquids.

21. The application of blisters, excellent in most local inflammations, are said, in the present case, to be hazardous, from the possibility of absorption; I have, however, frequently directed them, and, almost invariably, with advantage. (Case 1.)

22. The favourable progress and decline of the inflammation will be determined by the abatement of symptoms; the local pain and heat gradually diminishing, the pulse becoming softer, the tongue clearer, the skin cooler and more relaxed, the urine more abundant, and from clear, pale, or red, becoming thick, and depositing a copious sediment. The patient, under these circumstances, will also breathe more freely, and turn in bed with more comfort than before.

23. But, notwithstanding that, in certain states of constitution, the lancet must be considered our principal dependence, the treatment will frequently require to be modified, according to circumstances. Provided the patient has youth and strength on his side, and the symptoms are urgent, large and

* First Lines of the Practice of Physic.

† Principia Medicinæ.

repeated bleedings from the arm, and immersion in the warm-bath, as often as may appear expedient, are very proper, as well as very powerful, remedies ; but where the patient is not young, and the constitutional powers are in a state that admits of their being much more readily taken down than set up again, common prudence, with a very limited share of observation, may suggest the necessity for caution. Every symptom should be considered with attention, and every means of treatment, that can operate by diminishing strength, should be so directed, that it may, as nearly as possible, do what is wanted, without doing more.

24. Upon this principle, the application of leeches, or cupping-glasses, will often supersede the use of the lancet ; the hip-bath, or fomentations only, will be occasionally preferable to the complete immersion of the body ; and the more direct means of abating arterial action will be powerfully assisted by the judicious administration of opiates, particularly where there may be reason to suspect calculous irritation in the kidney.

25. There are some cases of inflammatory affection of these glands, the management of which will require almost infinite caution ; in these instances the attack usually comes on without any sufficiently obvious exciting cause.

26. It sometimes happens, that towards the turn of life, there is an attempt made to produce a new disease in the constitution, or, at least, one new to the patient, who has never experienced it before. When this occurs, should the constitutional tone be materially deficient, or should the treatment of the apparent symptoms be carelessly conducted, the chances are extremely unfavourable, from the probability of the disease settling itself upon some vital organ ; an event which generally terminates fatally. In this way I have seen several instances of gout making its appearance. In one, the great toe first

became tender, and somewhat inflamed, but this, in a day or two, went off, upon the sudden accession of paralysis from affection of brain, from which, notwithstanding every thing possible was done for his relief, the patient never recovered, although he continued to live some few years in a wretched and helpless state. Another instance of this kind, where the kidneys were principally concerned, is the following.

CASE 2.

Partial Suppression, with Inflammation of the Kidney, from Gout.

August 12. 1815. I visited a gentleman, aged 40, suddenly attacked at midnight with violent pain in the right kidney, shooting down in the course of the ureter; with nausea, vomiting, and desire to pass water. A sense of numbness in the fore-part of the thigh, and tenderness in the testicle, on that side. Pulse 100, small, but hard; tongue scarcely white; thirst considerable; urine high-coloured, turbid, and small in quantity.

To render the case clear, a silver catheter was passed into the bladder, and about an ounce of urine drawn off. A saline draught, with tincture of opium, was then directed every four hours; and some leeches to the loins, which were subsequently fomented.

Under this plan his health improved; and in a few days he walked with comfort about his chamber, and could take light food.

Without obvious cause, sickness and vomiting now returned, with a rejection of thin watery fluid; with tenderness, pain, redness, and swelling, at the ball of the great toe. I directly suspected the whole of the attack had been gout. On enquiry, this disease was known in the family; but, as my patient had never felt it before, he would hardly believe it to be so. I was, however, so clear

of the fact, that he was immediately directed to take a few glasses of wine daily, with a more generous diet. A light tonic was prescribed, and the former draught still continued every evening. It agreed well; and, as the medicine had probably assisted in bringing the constitutional disease round to its right point, it could not, perhaps, have been changed for a better.

When the toe inflamed, all remaining uneasiness left the loins, and the health and strength improved. The inflammation proved transient, the pain extending along the sole of the foot, with œdema.

In a week, the toe was nearly well; the complaint soon went off altogether, leaving the patient in better health than for many months before.

August 3. 1816. This gentleman passed a small uric acid calculus, by the urethra; but was well in health, except that he sometimes voided a red-coloured sand, with his water. He took medicines, and was relieved.

May 12. 1817. He called on me, having just had a smart attack of heat and pain in his toe; it was preceded by dyspepsia, continued a few days, and then left him in improved health.

April 1. 1819. Still subject to red gravel, and sometimes to irritation, as if from calculus; and, upon exercise, bloody urine. For these symptoms he took the alkalies, particularly soda, with great benefit.

SECT. III.

Suppression, from Calculi in the Kidneys.

27. THE mode in which calculi in the kidneys operate in producing suppression, is as little understood as that of any of the other causes of suspended secretion of urine; although there is no doubt of the fact. These bodies, however, are known to excite other consequences of irritation, disturbing and impeding the functions of the glan-

dular structure ; it may, therefore, be supposed, that as calculi produce their other ill effects through the medium of irritation, they operate on a similar principle in inducing suppression of urine.

28. Generally speaking, the degree of irritation from calculi in the urinary passages, productive of suppression, will be such as has already brought on other ill consequences in the seat of the disease ; either high vascularity of the membrane lining the cavities of the kidney, ulceration of its internal surface, or some further injury. A woman labouring under these complaints, died with violent pain in the left side. For five or six weeks she had complained of pain in making water, and constantly discharged, with little urine, a large quantity of matter. Her complaints altogether had lasted seven or eight months. A great quantity of purulent matter was found among the intestines, in the left side of the abdomen ; none in the right. The left kidney was almost entirely destroyed by long-continued irritation, and consequent ulceration. Only a part of the pelvis remained, which was thickened, scirrhus, and contained two stones ; one thick, and with processes extending into the infundibula ; the other, a small calculus. The lower ribs, on which the kidney had laid, were carious. The bladder was healthy, but full of pus.* The morbid appearances, however, that arise from calculi, will be more particularly enumerated in treating upon calculi in the kidneys.

29. A careful attention to the course and succession of symptoms, in diseases, will frequently explain circumstances, not otherwise to be understood. It is well known, that those who die from suppression, or even retention of urine, become comatose ; but upon what principle this happens, is not at first perfectly evident. By attending to cases of this sort it will appear, that, at a certain period,

* From a MS. of Mr. WATSON's, in Mr. HEAVISIDE's Museum.

and not before, the affection of kidney excites an increased degree of sympathetic disturbance of stomach, nausea, and vomiting; and efforts to vomit, from whatever cause excited, are among the most frequent sources of mischief, within the head. In the present case, the consequence is generally serous effusion alone, which, I believe, arises from the state of constitution necessarily connected with calculous complaints, being that which long subjected to irritation, is more prone to serous than sanguineous effusion, and consequently the same accidents which in strong health would rupture a blood-vessel in the brain, will in these complaints induce serous effusion (40.); most commonly confined to the membranes of the brain, but now and then taking place elsewhere, giving rise to ascites, &c. An interesting example of this latter kind is published by Mr. LANGSTAFF, in which, after death, the diseased kidney, exceedingly enlarged, was removed and injected. It was then found beautifully vascular, and when cut into, more than a pint of pus flowed out, leaving a large cavity excessively vascular internally, in most parts thinly coated with lymph, but in no point more than one-fourth of an inch thick; resembling the cyst of a chronic abscess. A large calculus occupied the pelvis of the kidney; filling up the opening of the ureter, which was highly inflamed.*

30. In the treatment of this kind of suppression, when the attack has been preceded or attended by much pain in the loins, and those sympathetic affections denoting increased action, the depleting system must be adopted, with such qualification as the symptoms may suggest. These may be succeeded by either the milder diuretics, antispasmodics, or opiates. When very little or, perhaps, no local pain is experienced in or about the loins, there

* Med. Chir. Trans. vol. xi.

may be no objection to trying the more powerful terebinthinate remedies, taking care at the same time to watch their effect attentively, which may enable us at least to prevent any ill consequences from the experiment.

31. In the enumeration of symptoms common to suppression, (2.), it was observed to be usually unattended with desire to void urine, and unconnected with tumour in the seat of the bladder. Professor DELPECH very truly observes, that there are cases in which, from one symptom being absent, and another indistinct and obscure, the treatment will require particular care. Thus, retention of urine may be connected with rigid spasm of the abdominal muscles, so as to conceal the tumor of the bladder; and, on the other hand, hysterical affections, with suspended secretion of urine, and at the same time the most incessant and urgent calls to pass water, may be also attended with similar spasm of the muscles of the lower belly; and this continuing several days, with great pain, and no flow of urine, may lead the attendants to conclude it is retained in the bladder, while the tense abdomen prevents the detection of the tumor.

“ Nous avons vu (continues the professor), dans un cas de cette espèce, plusieurs praticiens qui ne manquaient pourtant pas de lumières, tellement abusés par ces apparences, que la sonde ayant été portée vainement dans la vessie, qui était absolument vide, et l'élasticité de sa paroi postérieure repoussant l'instrument quand il étoit abandonné à lui-même, ils se persuadèrent qu'un obstacle dont la structure leur parut devoir être membraneuse, et qui leur paraissait occuper le canal de l'urètre, s'opposait à l'écoulement de l'urine et à l'introduction de la sonde dans la vessie. En conséquence, un long trois-quarts fut engagé dans le canal de l'urètre, et plongé dans les parties qui résistaient à la sonde. Cette opération n'amena pas d'urine, et la malade mourut peu de temps après. A l'ouver-

ture du cadavre, on reconnut que la vessie était vide ; que les accès d'hystérie avaient été les symptômes d'une suppuration profonde des deux reins, et de la présence d'une masse de calculs urinaires dans ces mêmes organes ; enfin, que la résistance que la sonde avait rencontrée venait de la paroi postérieure de la vessie, et que le trois-quarts avait été poussé contre cette même paroi et à travers le corps de la matrice." *

32. Keeping up a discharge from a blister, or issue, upon the loins, I have repeatedly known afford very considerable relief. Where a blister has been applied, it scarcely ever operates unfavourably upon the seat of the disease ; at least, whenever the irritation from a blister has created inconvenience internally, its ill effects, as far as I have seen, have either been confined to temporary irritation at the neck of the bladder, or have gone on farther to excite painful uneasiness in the nearest absorbent glands ; and both these effects, upon changing the blistering for the savine ointment, have immediately subsided.

33. When the secretion of urine becomes more free, and the symptoms are observed to verge more nearly to those ordinarily consequent to irritation from calculus, the treatment must be conducted upon the general principles laid down for the relief of those who labour under calculi in the kidneys.

CASE 3.

Partial Suppression of Urine, from Calculi in the Kidneys.†

A WOMAN was admitted into the Westminster Hospital, Aug. 7. 1765, reported with stone, under Mr. PYLE's care. There was a suppression of urine, occasioned, as supposed, by a stone or stones in the bladder ; but on examination none were found.

* Précis Élémentaire, tom. ii.

† Extracted from a MS. of Mr. WATSON's ; which, together with the disease, is preserved in Mr. HEAVISIDE's Museum.

While in the hospital she voided little water, yet, on passing the catheter on one occasion, as much as half a pint was found. She remained much in the same state for a fortnight, when she died.

In the abdomen the viscera were sound, except the kidneys; here was the source of her complaint, and cause of her death. Both these glands were in a soft, almost putrid state; and very much enlarged. In the pelvis of the right kidney was a tuberculated triangular stone, one angle of which had passed through an ulcerated hole in the pelvis, appearing externally. The pelvis of the kidney was exceedingly thin and tender round the part where it had given way.

Lodged in the infundibula of each kidney, calculi were found; in the cells of the right were several small stones, in those of the left, there was a great deal of sabulous matter, but only one stone that had reached the size of a pea. The ureter of the left kidney contained several small calculi, some distance down; these were not larger than peppercorns. In the bladder was a small quantity of sabulous matter, loosely adherent to its internal coat, otherwise the bladder was healthy.

The opening made by the stone through the pelvis of the kidney, must have allowed the urine to escape into the cavity of the abdomen; and thus have hastened the fatal termination of the disease.

CASE 4.

Suppression of Urine, from Calculi in the Kidneys.

Tuesday, Aug. 6. 1816. I opened the body of a healthy looking man, aged 83; subject many years to gravel, and occasionally passing small red calculi: for the last twelve months, and particularly within the last seven weeks, he had suffered much from an aching pain at the left side in the loins: always active, and on his feet, till within a week of his decease.

The whole of the preceding *Wednesday*, he had passed no water, nor from that time forward. From *Wednesday* to *Friday* evening, he had a constant and urgent desire to void urine; these symptoms then gave place to sickness at stomach, with bilious and fœcal vomiting.

On *Friday* morning he began to feel drowsy, and said he could not tell what made him so heavy; complaining also of headache and thirst. On *Friday* and *Saturday* he became progressively more comatose. On *Sunday* morning I was requested to see him, as he had for many days passed very little water, and for the last four days none at all.

He appeared as if asleep; but when shook or disturbed, opened his eyes, and spoke incoherently. The pulse was undisturbed; a silver catheter passed with perfect ease; two ounces and a half of pale urine were drawn off; he died the same evening.

On examination the kidneys, though small, were found loaded with fat.

In the pelvis of the left kidney was a large uric acid calculus, filling up the opening into the ureter; besides many smaller fragments of similar calculous matter. The irritable inner membrane displayed numerous capillary arteries ramifying on its surface. The pelvis and infundibula, however, did not appear to have secreted any excess of mucus, nor any thing resembling pus; these cavities contained only a brownish coloured urine, which, confined by the position of the stone, had produced some distension of the kidney.

In the right kidney were many fragments of calculous matter, and by a careful examination of the sections of the cortical structure, minute calculi, not so large as the heads of pins, were detected in the substance of the kidney; confined apparently in the tubuli uriniferi. In two or three instances, it seemed, that as these minute calculi increased, they had excited the action of the absorbents to remove a part of the surrounding substance of the kidney.

On various parts of the membrane lining the infundibula, I perceived small points, which examined with a magnifying glass, proved to be particles of calculous matter laying behind and shining through the membrane; several of these I cut down upon and turned out, with the point of a lancet.

The bladder, containing half an ounce of a brownish coloured urine, was remarkably small and thin. The inner membrane covering the prostate gland, and lining the neck of the bladder, had the appearances of irritability, though not in any excessive degree.

SECT. IV.

On Abscess, and other Diseases of the Kidneys.

34. THE propriety of treating of the following diseases of the kidneys, in a chapter professing to include only those affections producing suppression of urine, may be somewhat doubtful. It may, however, be perhaps assumed, that the functions of the kidneys have, in certain instances, been diminished or destroyed, under almost every particular change of structure known, while, in other instances, each of these deviations from healthy organization have been detected, without having appeared materially to prejudice the office of secretion; and that in other cases again, the separation of urine by the kidneys has been either temporarily suspended, or permanently set aside, without any trace of disease in these parts appearing after death. Indeed, so little is with certainty known, and so much remains to be ascertained by the diligence of future researches upon this subject, that the desire of regarding method and form must not be permitted to operate with too much rigour, in excluding facts practically important.

35. The favorable termination of inflammation in the kidneys, when resolution is at hand, will be ascertained by the signs already mentioned (22.): should the symptoms indicating inflammatory ac-

tion continue with undiminished violence beyond the first week, the chances will be unfavorable, and there will be reason to apprehend that suppuration, abscess, or some chronic derangement in structure, will follow.

36. Where suppuration is about to take place, the feeling of heat, and acute pain in the loins, diminish, giving place to a sense of throbbing or pulsation. There are slight occasional chills or rigors, and the patient sometimes complains of increasing sense of weight or heaviness in the part. M. DESAULT observes that the numbness and stupor previously felt about the hip, and down the forepart of the thigh, is either increased, or changed to an acute shooting pain.

37. When abscess forms within its substance, the kidney will occasionally become much enlarged, its healthy texture being injured or destroyed. Provided neither calculus nor other mechanical obstruction prevents, matter deposited within its general cavity may flow down into the bladder, and so escape with the urine. Frequently, however, a collection of matter occupies a part only of the cortical substance of the gland, from which there is no ready outlet; this collection increasing, some part of the thickened parietes becoming weaker than the rest, give way, and the purulent contents find an exit, either through the medium of previously formed adhesion, into some part of the intestinal canal, or by escape into the cellular membrane covering the kidney; thus making itself, sometimes, a way between the peritoneum and psoas muscles down towards the groin. In some such cases, the matter reaches the external integuments; in others, it produces suppuration backward, with tumor, pointing at some part of the loins, when it may be either opened by an operation, or induce for itself a fistulous passage. (Case 6.) It may, lastly and least favourably, fail in the attempt to establish a safe exit, and burst at any

point through the peritoneum into the cavity of the abdomen, inducing peritoneal inflammation and death. (Case 5.)

38. When abscess has taken place in the substance of the kidney, the most favorable direction in which it can break is into the general cavity connected with its pelvis. With a view to assist any disposition of this sort which may be presumed to exist, some have proposed to excite vomiting, sneezing, or coughing. As, however, it is totally impossible in the advancing stage of any case of this kind, or, indeed, during life, to ascertain with precision the exact state of the parts affected, the consequences of such attempts must often be injurious, and always uncertain; for which reasons, it appears much more proper to leave this work to nature, and wait patiently its success.

39. Ulceration of the membrane lining the cavities of the kidney, frequently takes place, and should it continue, may go on to involve, progressively, the whole of the substance of the gland in disease. In the Museum of the Royal College of Surgeons, is a specimen in which the membrane lining the pelvis of the kidney is raised in small spots by coagulable lymph effused into the cellular substance behind it, from the centre of some of which spots, the membrane has subsequently ulcerated away. Generally, however, the irritation producing the mischief operates on a much more extensive scale, but even then these diseases may continue long before they prove fatal. Dr. CLARKE mentions a man more than two years subject to great pain in the left kidney, with distress and difficulty in passing his urine, which contained large quantities of greenish pus; till at length worn down by disease, he died. On inspecting the body, the left kidney, twice its natural size, contained half a pint of greenish pus, in many cysts; the bladder being thickened, and containing pus similar to that in the kidney.*

* Edinb. Med. Journ. vol. v.

40. The degree of enlargement the kidney may thus undergo, is sometimes astonishing. * CABROLIUS removed from the dead body a kidney so immensely enlarged as to weigh fourteen pounds; it was converted by disease into a large abscess, and had occasioned symptoms supposed to proceed from stone. † Neither is the formation of abscess confined to an advanced period of life; for, in one instance, in an infant of a few months old, both kidneys were found enlarged beyond the size of a duck-egg, apparently much inflamed, and containing each more than a table-spoonful of pus; the bladder being full of a purulent fluid; there was also half a tea-cupful of water in each ventricle of the brain. ‡ Mr. WATSON remarks that, in this case, all the mischief arose from the inflammation in the kidneys; and doubts if hydrocephalus in children be not often owing to this cause, induced by improper diet, or over-feeding. (29.)

41. Abscess in the kidney, as a consequence of inflammation, necessarily supposes the preceding existence of inflammatory action, with its attendant diagnostic symptoms. There are, however, exceptions to this rule. It appears that the kidneys, like most other glandular structures, are susceptible of scrofulous, as well as healthy, inflammation; and although I am not aware that the remark has been made by others, observation induces me to believe that the symptoms that attend in the one case, are very different from those that occur in the other. In healthy inflammation, the region of the kidney is the seat of the principal distress; in scrofulous inflammation, the sympathetic irritation at the neck of the bladder takes the lead; and, in fact, is generally the only apparent source of misery to the patient.

42. A case of this kind, as it appears to me, is

* PLATE II. *Fig. 1.*

† *Alphabetum Anatomicum. Obs. 28.*

‡ From a MS. of Mr. WATSON'S, in Mr. HEAVISIDE'S possession.

related by Mr. DOUGLAS, in which, for eighteen months, there was heat, pain, and constant desire to void urine, followed by great misery. On standing, the urine assumed a greasy appearance, like lime-water, after some time depositing a purulent matter in great quantity, but without offensive smell. The recent urine was thick and whitish, but on standing deposited a sediment, and became clear. There was seldom any severe pain in the back, but frequently a total retention of urine. A colliquative diarrhœa, in spite of every means, proved fatal. The right kidney was found filled with foetid purulent matter; all its inner substance wholly wasted; its exterior part rendered so thin by expansion, that the slightest touch broke through it. The ureter, contracted in several parts, was surrounded by indurated glands. The bladder, contracted and firm, was internally as if excoriated, with little red fleshy carbuncles. The urethra exhibited marks of ulceration. It is curious that the opposite kidney was twice the natural size.*

43. Another instance where the peculiar characters of this disease were present, is related by Mr. GOOCH; who terms it "a very singular complaint in the bladder." A young gentleman, for gonorrhœa seven years before, had used strong mercurial purgatives, taken cold, and had the discharge stopped by large doses of the Bals. Copaib. The most violent straining, and extreme pains in making water immediately came on, and never afterward left him. Opiates alone mitigated his sufferings, in which two ounces of the Tinct. Theb. in the twenty-four hours, often procured a little ease, but no sleep. The urine contained much pus, with mucus, and sometimes pieces of a soft fleshy substance. Under suspicion of stone, the most eminent surgeons had sounded him to no purpose.

* Philos. Trans. vol. xxvii.

His health and strength consumed in torment and misery, he died in the eighth year of his disease.*

I have attended one very strongly marked case of this kind, in a young woman, in which, although it proved fatal, the kidney was least of all suspected, either by Dr. JAMES, Mr. HEAVISIDE, or myself, as the seat of disease. By reference to the case, a remarkable coincidence between it and those just mentioned, will be found in several important symptoms (Case 8.); although the appearances of the disease on examination, it will be seen, differed very much from those commonly attendant on inflammation. In the Museum of the Royal College, is an injected specimen of a similar affection of kidney from a scrofulous boy; shewing that the deposit of albuminous matter is not obviously organized, at least not apparently vascular, having received none of the injection.

44. I believe another case on which I was consulted by Mr. BARROW, *Jan.* 1822, was of this kind. It was in a young lady of fair complexion and scrofulous habit. Married four years, she from that time dated her distress, by irritation and extreme pain in making water. As in the other case, this lady had been sounded, and I repeated the operation; but no stone nor other disease was found. The urine was clear and of healthy appearance. Pregnancy had no material influence in relieving the symptoms. The medicine directed was steel, and in a few weeks it certainly had proved useful; the irritation at least was in her opinion diminished. I at first suspected the uterus in this case; but latterly thought it a scrofulous affection of kidney.

45. Where from healthy inflammation abscess has formed, the period when it breaks may be usually determined by diminished throbbing, fullness, and uneasiness, and by observing that the

* Gooch's Chirurgical Works, vol. i.

urine again flows more freely, if it has burst into the cavities of the kidney. This event may be determined with more certainty by the quantity of purulent matter mingled with blood that passes off with the urine. Should the disease, however, be scrofulous, these circumstances do not take place, neither is there, as far as I know, a single symptom by which the affection can be distinctly recognized.

46. The principle of treatment to be held in view, where abscess has formed in the kidney, must be regulated by constitutional, as well as local, circumstances in each case. Should it appear that a disposition to healthy action prevails, astringents of gentle power, balsamic medicines, the balsam of Mecca, Peru, copaiba, or perhaps terebinthinate mixtures, may be cautiously tried, and continued, provided the appearance of the discharge improves, or its quantity lessens under their use ; but laid aside, if feverish symptoms, renewed local pain, or other change for the worse takes place under their administration.

47. When, however, it appears that the disease is scrofulous, or that a tendency of this kind prevails in the system, it appears to me that the more direct tonics, on which we depend in the more common varieties of scrofula, should be here also had recourse to. Medicines containing lime-water may perhaps be tried for a time ; but the preparations of bark, or the mineral chalybeate springs, if the waters are cautiously taken, and steadily persevered in, appear likely to confer more benefit than any other plan, provided due attention is at the same time paid to the observance of a proper diet, including milk, and other unstimulating but nutritious substances. Medicines containing steel may in some instances agree well, where the mineral waters will not answer. Should these means upon trial not appear to do good, I should myself have just the same confidence in recommending sea air, and sea bathing, in this as in any other scrofulous

affection; although well aware that even this remedy does not always succeed.

48. It is, however, consolatory to know, that although our efforts to restore local health, may in certain diseases fail, yet if we have been so far successful as to have re-established the constitutional health, the local disorder frequently becomes harmless, proceeding no further; and under these circumstances it generally happens that increased action in the remaining healthy kidney, compensates for the diminished power of that which may have been the subject of disease. (42.)

49. Should the abscess, through the medium of adhesions, have been enabled to pass its contents into the intestinal canal, most probably some part of the colon, the event will be determined by the signs mentioned (45.), with the addition of sudden disturbance of the bowels, in which purulent matter mingled most commonly with blood, passes off by stool.

50. Where the symptoms indicating inflammation and suppuration of the kidney, are succeeded by tumor in any part of the lumbar region, there will be strong reason to conclude abscess has taken place. In this case some have advocated the early opening of the tumor, to ensure a safe outlet for the matter, while others have urged the greater propriety of leaving every such difficulty to nature. It is scarcely possible to lay down general rules, under such circumstances. Much, it appears to me, should depend on the apparent disposition or power of the constitution to assist itself. Should the formation of matter, and advance of the tumor containing it, have created but very little general disturbance, there will be some encouragement to venture a chance for the advantage of the patient; but where, on the contrary, we find the health and strength much reduced, and the hectic flush already upon the cheek, there will be little

reason to hope for any essential improvement in the condition of the patient, from an operation.

51. Should the circumstances of the case stand in favour of letting out the contents of the abscess, it is desirable that the matter should be previously brought near to the external integuments; for which purpose fomentations and poultices may be directed. The part where the point is most clear, and the volume of fluid most evident, being selected, the skin first divided from above downward for an inch, will enable the operator to determine with precision as to the thickness of the cyst, through which a large-sized common trocar may then be cautiously pushed forward until no resistance is felt. The stilet being then withdrawn, the fluid contents flow off; and the stilet may be either removed, retained, or replaced by one of elastic gum, secured either by a bandage, or by adhesive plaister. Should the matter be found to lay deep, and require dissection, it will be necessary to be prepared for bleeding, and small-sized curved needles must be therefore previously laid ready, as ligatures will by this means be more readily applied here than by the tenaculum.

52. For the performance of operations where, as in this case, it is important to know the instant when the point of the instrument reaches the fluid contents of the cyst, I have often thought the common trocar might be much improved, by having a groove cut upon one of its flat sides, commencing at the point, and carried along the stilet quite to the handle; this would inform the operator not only of the moment when the instrument should be withdrawn, but more promptly acquaint him with the nature of the contents of the tumor.

53. The contents of the abscess let out, the cavity has the opportunity of gradually contracting itself; to favour which change, attention must be paid to prevent the external opening closing too soon. When such abscess is connected with the

cavities of the kidney, the urine will of course flow off by the wound, and it may then be difficult, if not impossible, to prevent the continuance of a fistulous opening. This circumstance, however, although uncomfortable, is not in itself attended with risk, numerous instances having occurred of fistula in the loins discharging urine for many years.

54. Where the abscess, however, breaks into the cellular membrane surrounding the kidney, the case generally terminates unfavourably. Disease takes place in neighbouring parts, the matter becomes unhealthy by confinement, and fever increasing, the patient sinks. (Case 7.) The consequences that follow upon the escape of purulent matter into the cavity of the abdomen, have been already noticed. (37.)

55. The treatment under continued discharge from abscess of the kidney, will depend on the health. If the patient preserves his strength, appetite, and spirits, little will be required beyond a nourishing diet, of easy digestion. Should, however, the health give way, and hectic flushes arise, the constitutional powers must be supported by the most assiduous administration of tonic and cordial medicines, with strengthening diet, and, if expedient, change of air.

56. The above observations apply to collections of purulent matter formed in the kidneys, but these parts are also occasionally subject to other chronic derangements of structure; sometimes without the intervention of accident, but generally as the consequence of external violence. Dr. CLARKE relates an instance in a child, of the kidney diseased from a blow, forming a large encysted tumor, five pounds weight. The inner surface was of an ash colour, surrounded by a white, fatty, or steatomatous substance, which on pressure effused a fluid, and some solid substances, not out of cysts, nor resembling hydatids. There was no internal cavity,

collection of fluid, or remaining trace of the natural organization of the kidney. * In another instance, after repeated attacks of pain in the region of the loins, numbness of the leg upon the same side, sickness at stomach, and a black sediment in the urine, increased pain and irritation followed, ending fatally. The left kidney was found enlarged to five pounds in weight, and formed into large cysts filled with a grumous bloody fluid. Two or three of these cysts were accidentally ruptured in separating the disease from the surrounding parts, and others opened by making a section through the tumor. Mr. COWPER, who relates the history, observes, that in these cases the serum of the blood, together with its colouring matter, passes off by the kidney; such urine becoming thick, when heated in a spoon over a candle. †

57. Neither must it be taken for granted that, where a large fluctuating tumor presents in the seat of a diseased kidney, it will be always found to contain purulent matter. A case is mentioned by Mr. MARTINEAU, in which such a tumor was tapped, and ten pints of bloody fluid let out. The same tumor filling again was a second time punctured two years afterward; but opened with a lancet instead of a trocar, the fluid escaped into the abdomen, and the patient consequently lived but a few days. On examination it was found that the left kidney (the ureter quite obliterated) had enlarged, by gradual distention, into an immense bag, containing the fluid discharged in each operation. ‡

58. In some rare instances the kidney has been known to suffer a degree of enlargement truly astonishing. M. LIEUTAUD mentions an instance where it was dilated into a bag, containing as much as six pints of fluid ||; but one of the most singular cases, perhaps, of this kind is related by Mr. GLASS,

* Edinb. Med. Jour. vol. iv.

† Med. Comment. vol. ix.

‡ Phil. Transact. vol. xix.

|| Précis de la Med. tom. ii.

of a congenital dropsy. The mother dropsical in her pregnancy, the infant was born with the abdomen full of water, but otherwise healthy; and, though the disease increased as she grew up, she lived to be twenty-three years old; she was otherwise healthy, but of enormous bulk. The catamenia left her eight months before her death, and from that time she declined with the usual symptoms of dropsy. On perforating the abdomen, near thirty measured gallons of a light coffee-coloured fluid came away. Laying open the belly, a large membranous bag, that had contained the water, presented itself, partially adherent to the anterior parietes of the abdomen, and occupying nearly the whole of its cavity. In appearance, colour, thickness, number, magnitude, and distribution of blood-vessels, it much resembled the uterus of a cow, at the end of gestation. The whole inside was scabrous, as if parboiled, and within it was a small remaining quantity of a coffee-coloured fluid. On the left interior part was discovered the orifice of a duct, which opened obliquely into the cavity of the sac, and easily admitted a goose-quill. This tube advanced twelve inches between the membranes of the bag obliquely upward to the right; whence it was inflected downwards, and passed between the duplicature of the ligamentum latum uteri, to be inserted into the bladder of urine. The left kidney, with its blood-vessels and ureter, were in their natural state and situation. The urinary bladder was very small but sound. Search was next made for the right kidney, but no such viscus was found, unless the sac that contained the water might be esteemed such. The disposition of the vessels on the right side favoured this opinion, as they passed from the aorta and vena cava to this sac, in the same manner as to the opposite kidney, and having run twelve or fourteen inches between the membranes of the bag, without

throwing off any branches, were afterwards distributed over it, in the manner described.*

59. There can be no doubt that in the above case the immense sac found after death was originally the kidney; and the enormous enlargement that it had suffered affords a possible, if not probable, explanation of certain rare examples of disease, which viewed in any other light appear quite inexplicable. (Case 9.)

60. The most ordinary effect of distention is commonly a degree of enlargement, more or less considerable, of the internal cavities of the kidney. This change, which reduces the substance of the kidney, giving it the appearance of a number of cells or cysts, is usually the consequence of continued accumulation of urine, either from calculi, or other mechanical obstruction, preventing its escape by the ureter.† I have, however, in several instances removed kidneys affected in this way, where the state of the parts afforded no very satisfactory explanation of the fact.

61. A favourable opportunity, through the kind attention of Dr. JAMES, recently occurred for determining the appearance of the capillary circulation when thus circumstanced. I removed a kidney, enlarged from the escape of urine being prevented by a calculus in the ureter; and injected it with size and vermilion. Upon the clear white surface of the mucous membrane lining its cavities, numerous small red specks were perceived, which, rendered distinct by a magnifying glass of considerable power, proved to be minute clusters of very finely injected capillary arteries. The preparation is preserved in Mr. HEAVISIDE's Museum.

There is a similar kidney, injected by Mr. HUNTER, in the Museum of the Royal College of Surgeons; the vessels upon the inner membrane are

* Phil. Trans. vol. xlv.

† PLATE I. *Fig. 2.*

numerous, and the capillary arteries are in many points distinctly visible to the naked eye.

The most recent and best example, however, occurred lately in a man long distressed by a nearly impervious stricture; and who only a few days before his death was admitted, under Mr. HEAVISIDE's care, into the Infirmary. On opening the body, finding one of the kidneys rather enlarged, I removed and carefully injected both. The left contained a little urinous fluid, and some shreds of flocculent albuminous matter, which during life had been effused from the same exhalent arteries that were now injected. In some parts the pure transparent size, in small masses equal to grains of sago, had passed either by the exhalents or by the tubuli uriniferi, and lay upon the injected membrane. By the naked eye many clusters of arteries were seen distinctly; but the whole surface had a decided red blush, which by a glass of small power I found partly, and by one of greater power entirely, dependant on myriads of finely injected vessels, principally dispersed in the texture beneath the surface of the membrane. In the right kidney the appearances were similar; but here some of the finer particles of the vermilion had passed with the size, by which the little masses that had transuded were consequently found tinged. The right kidney is deposited in Mr. BROOKS's, the left in Mr. HEAVISIDE's Museum.

Occasionally the kidney is found not only subject to this kind of enlargement, but the secreting vessels separate unhealthy urine, not containing the more usual varieties of calculous matters, but depositing carbonate of lime. I first met with this disease in opening the body of a person who never was known to have suffered from nephritic complaints. The kidneys were accidentally examined; the right was perfectly healthy, and larger than common; the left, also enlarged, felt as if crammed

with a stiff pulpy substance. Removed, it was extremely heavy for its size, weighing more than a pound and a half. Cut into, the pelvis and infundibula were found full of a peculiar compact earthy substance, consistent like birdlime, and of a pale yellowish grey colour, which substance Professor BRANDE did me the favour to examine, and found to consist of nearly pure carbonate of lime, mingled with an extremely tenacious animal matter. The accumulation of this substance had probably been going on a long time, as the cavities containing it were enlarged by the continued pressure, attended with a partial removal of the solid structure of the gland. The artery and vein were readily found, but although the parts were dissected, I could perceive no remaining trace of the ureter, so that the healthy functions of the kidney must have ceased very long before.*

63. I have since seen, in the Museum of Mr. BROOKS, a similar specimen, in which the absorption of the healthy structure of the kidney has become nearly complete, leaving little more than a membranous cyst filled with dense earthy matter. In this preparation some remains of the extenuated ureter still exists. The peculiar consistence of this substance, and its precisely similar appearance in these two instances, might suggest a doubt as to the circumstances under which it is first deposited. This, however, is removed by the preparation of a kidney in Mr. HEAVISIDE'S Museum, demonstrating the intermediate state between simple distention, and the deposit of the tenacious carbonate of lime. A small glass contains a part of the contents found in the kidney, one third part of which is a fine, white, dense, cretaceous powder; the remainder a urinous fluid. The surfaces of the cells within the kidney are still seen partially coated with particles of the same white matter as that let out from their

* This disease is preserved in the Museum of Mr. HEAVISIDE.

cavity. The remaining kidney from the same person, also preserved, affords still further illustration; enlarged in proportion to its increased duty, the same morbid disposition may be perceived to have existed in this, as in the other, by the white particles of cretaceous matter adhering to the cavities of the infundibula, attended with much irritation, inducing the formation of a small abscess, in the cortical substance at the upper part of the kidney, connected by a small opening with its pelvis.

In the Museum of the Royal College of Surgeons is a kidney exhibiting a calculus of the dark brown colour of lithic acid, impacted in the pelvis; all the remaining cavities of the gland, several converted into ossified cysts, being filled with a peculiar matter, in appearance and consistence exactly similar to the carbonate of lime above described. We must conclude, I think, in this case, that the uric acid calculus was first formed, and that the diathesis became afterward most completely changed; for the subsequent deposit exhibits no trace of any such tendency, except in the existing calculus, the escape of which was accidentally prevented.

64. The kidney is, however, subject to other chronic derangements of structure, one of the principal of which is the formation of serous cavities, or cysts, within its substance, or upon its surfaces. The most common variety of this disease consists of cavities filled with a limpid fluid, in some instances few in number, occupying the external part only; in others exceedingly numerous, and dispersed throughout the substance of the gland. I have most commonly seen these appearances between the peritoneal surface, and the cortical substance of the kidney; part of the transparent membranous cyst raised above the surface, and part of its fluid contents buried within the substance of the gland. These cysts appear to originate in the fine cellular texture, connecting together the solid structure of the kidney. Serous fluid is deposited at certain

points, and as this fluid accumulates, the pressure from within probably operates by condensing the cellular structure, so as to form a kind of fine cysts. As these cysts progressively increase in size or number, the solid substance of the kidney is removed by absorption, till at length, where the disease has been of long standing, scarcely a vestige remains of the natural organization. The most beautiful specimen I have ever seen of this disease, is to be found in the elegant collection of Dr. HOOPER. The kidney is much enlarged, and entirely converted into a closely disposed assemblage of cysts. A section carried through the whole, exposes these cavities, from the size of a currant, up to that of a walnut, without any remaining trace of healthy structure.

65. Another variety of serous cysts, to which the kidney is subject, constitutes the true hydatid; where the fine membranous bags containing the fluid, instead of being intimately connected with the surrounding parts, as in the former kind, are loose and detached, so that if the serous cavity containing them, happens to rupture into the pelvis of the kidney, the hydatids may escape into the ureter, and thus finding their way down into the bladder, pass off with the urine.

66. The symptoms attending these affections, are always extremely obscure, and in some cases pass entirely unnoticed. In a case mentioned by Dr. DAVIS, a middle-aged lady, after repeated attacks of pain in the loins, had regular symptoms of stone in the left kidney—a grinding or acute pain in the part, vomiting, the urine in the paroxysm tinged with blood, and containing small shreds of coagula: during the attack more than a dozen hydatids were passed, thin and membranous; some an inch and a half long, the thickness of a goose quill, and filled with a fluid, which in taste and smell appeared to be urine. The paroxysm generally lasted some hours, and when

all the hydatids had come away, which happened in the successive endeavours to void the urine, the pain in the back, &c. abated, and she continued easy and well for the rest of the day. The patient perfectly recovered. *

67. One of the least frequent consequences of disease in the kidney, is induration, or scirrhus. This state has been described as one of the occasional effects of inflammation, and M. DESAULT has enumerated the symptoms with which he considered the affection might be attended; upon none of these signs, however, should I confidently rely, as enabling the practitioner to distinguish a scirrhus affection of kidney from any other chronic state of disease.

68. Should the symptoms of inflammation in the kidney suddenly give way, all local pain suddenly subside, the pulse losing its firmness and becoming unsteady, there will be ground for apprehending that overpowered and exhausted by excitement, the increased action is sinking into a state of gangrene. This occurrence, which I have never myself witnessed, appears to be invariably fatal. It is right always to bear in mind the possibility of so serious an event, as an additional motive to activity and vigilance in relieving and moderating that excess of action which can alone lead to it.

69. Provided, however, the general health is good, it is remarkable how considerable a degree of irritation the kidney will sometimes be able to support. A case proving this is related in Dr. HENNEN's valuable work on Military Surgery, where a large fragment of cloth, driven by a musket ball through the body, lodged in the kidney, inducing repeated abscesses and severe peritoneal inflammation, was afterwards traced by its symptoms making its way down the ureter into the bladder, and thence outwards by the urethra, after

* Phil. Trans. vol. xxii.

nearly eight months of protracted and severe suffering, from which the patient eventually recovered.

CASE 5.

Abscess of the Kidney, from Calculous Irritation, producing Death by breaking into the Cavity of the Abdomen.

IN *May*, 1813, I examined the body of a child, aged seven years; his mother said his infancy was healthy, but that at eighteen months old, his urine, high coloured, was voided with straining, and sometimes pain. These symptoms varied in degree, but gradually increased. At four years old, he was seized with severe distress and pain in making water; the urine red as blood, depositing a sandy matter, feeling like coarse gravel.

When five years old, the distress, frequency, and straining in passing water, were so urgent as to lead to the suspicion of stone in the bladder. He was taken to a surgeon, who sounded, felt a stone, and advised the operation. The mother, however, determining, as she said, "to go upon sure ground," brought the child to Mr. HEAVISIDE, who, seeing the disturbed and highly irritable state of the constitution, was of opinion the operation should at least be postponed, until the general health was improved.

The fits of pain and distress, commencing in the loins, and passing down toward the bladder, still returned frequently as ever; he wasted in flesh, till at length an attack of excruciating pain and irritation, with fever, came on. He had now great pain, with excessive tenderness, over the whole abdomen, and could scarcely endure the weight of the bed-clothes. Under the pressure of these new complaints, he rapidly gave way, and within a week, died; worn out by continued pain and irritation.

The body was emaciated, but the abdomen tumid.

On opening its cavity, a quantity of pus, of a strong urinous smell, appeared loose among the intestines. The purulent fluid was consequent to extensive peritoneal inflammation. Both kidneys, especially the left, had suffered inflammation. They were studded externally with the appearance of pustules, from little abscesses, formed in the cortical part, shining through the peritoneal covering.

Upon the left kidney, an attempt had been made, by the effusion of coagulable lymph effecting an adhesion with the intestine, to form a safe passage for the discharge of the contents of the largest abscess. This attempt failing, the matter had passed with the urine into the general cavity of the abdomen, exciting peritoneal inflammation, and thus hastening the fatal term of the disease.

The ureters much enlarged, and internally inflamed, were filled with purulent matter.

The coats of the bladder were thickened, and its inner membrane highly irritable, containing a flattened oval calculus, an inch in length, made up of numerous thin alternate strata, of uric acid and the phosphates, deposited upon a uric nucleus. Besides the calculus, the bladder contained a little urine, and a pretty large proportion of a thick white mucous matter.

The diseased parts, illustrating this case, are preserved in Mr. HEAVISIDE'S Museum.*

CASE 6.

Large Abscess in the Kidney, terminating fatally.†

IN 1794, I visited a young lady, who had been married about a year. She became subject, about five months previous to my seeing her, to irritation

* See PLATE I. *Fig. 3 and 4.*

† The following history, with the disease itself, are preserved in the Museum of Mr. HEAVISIDE, who was the consulting surgeon in attendance.

at the neck of the bladder; she had frequent desire to void urine, which deposited a great quantity of thick mucus. These complaints she attributed to having taken cold during menstruation, which suddenly ceased, and never returned.

The disorder continued six weeks, in spite of opiates, and other rational means. It then suddenly left her, upon the accession of a pain in the back. This pain was constant, and seated in the right kidney. A few days subsequent to its commencement, a tumor appeared upon the part, and gradually increased, extending towards the region of the liver. This gradual external increase of tumor went on for about two months.

In this stage of its progress, I was called upon, and found a large tumor in the region of the liver, hard, extensive, and evidently containing a fluid. I said this seemed to be one of those cases I had sometimes seen, wherein the disease had never existed in the part where the first symptoms had appeared. That I conceived she never had any disease in the bladder, but a symptomatic action from an original affection in the right kidney, which, perhaps, might have suppurated, and during the inflammatory stage, formed adhesion to the liver, so as to point through that viscus. That although there was matter, the great hardness all around made it better to wait till it was nearer the surface, being yet deep seated; and that in whatever viscus it might be, the making an opening into it would afford the only chance, though a small one, of recovery.

In a few weeks the fluid came forward, and the attending surgeon desired me to open it, provided I thought it right so to do. Accordingly I carefully dissected down to it, between two of the lower ribs, over the region of the liver, till I came to a white, shining tumor, into which I plunged a hydrocele trocar. Five pints and a half of very offensive matter were let out. She lived six weeks

after the operation ; and in order that the bed might be kept clean, without improper confinement of matter, a hollow canula was kept in the opening, and the discharge let out twice a day ; the quantity evacuated each time, measuring four ounces. She gradually, however, became hectic, sunk, and died.

The liver was sound, but united by adhesion to the right kidney. The urinary bladder also was perfectly healthy. The whole of the disease was confined to the right kidney, which was greatly enlarged, and had within it a very large abscess, into which an opening had been made, when the contents were first let out. From this abscess had been discharged at first, five and a half pints, which with half-a-pint daily, for forty-two days that she lived after, being twenty-six pints and a half, formed a total of thirteen quarts of matter evacuated in the above period of time.*

CASE 7.

Abscess in the Kidney, discharging itself behind the Peritoneum ; with communication between Rectum and Bladder.

June 4. 1814, I was requested by Dr. HOOPER to examine the body of a gentleman who had died at Islington, aged 65 years. The following is an outline of his history. About four months previous to his death, he had been attacked with a vomiting and purging of blood, with febrile action, throwing out a number of petechiæ. These complaints prescribed for, were relieved. He then became affected with constant and violent pain in the left loin. The urine was thick, depositing what appeared to be purulent matter. His complaints were now treated with bougies, by an eminent surgeon, who said he had a stricture, though he declared he never in his life had any difficulty in passing his water.

*. See PLATE II. Fig. 1.

In three weeks the pain moved from his loins down towards his hips, and as this took place he found himself easier above. Soon after this change, he observed he made less water than usual, that his stools were more fluid than usual, and had the smell of urine. This went on for a week or two, when things appeared to be reversed; he now made plenty of water again, but with it there sometimes came a fluid fœcal matter by the urethra, and frequently flatus, passing forth now and then with an audible and most unpleasant sound. With these complaints he was harassed to the day of his death.

On examination, the peritoneum covering the left internal iliac and psoas muscles was found raised up by a large collection of matter in the cellular texture behind it. Some purulent matter found loose in the abdomen, was explained by pressing the membrane confining the abscess; the matter was seen to flow from a small ulcerated opening in the peritoneum.

This abscess, laid open, was found to have separated the kidney from the muscular parts behind it, quite up to the lower ribs, extending itself down to Poupart's ligament. The quantity of matter found in the abscess was about twenty ounces.

Several abscesses occupied the infundibula of the diseased kidney. It was one of these that had burst through the kidney backward into the cellular membrane, making its way as above stated.

The contents of the large abscess had discoloured and almost disorganised the muscular surface upon which it lay, rendering the cellular membrane and peritoneum sloughy to some extent.

A circumscribed inflamed spot had formed between the posterior surface of the bladder and anterior surface of the rectum, producing adhesion; within this circle of adhesion a small passage was found, by which a probe passed, where ulceration had established a communication, connecting the two cavities.

CASE 8.

Scrofulous Abscess of the Kidney, and diseased Ureter; with irritable and ulcerated Bladder.

A YOUNG woman, aged 26, complained in *July* 1820, of a weight and bearing down, with desire to void urine every quarter of an hour. The urine was in appearance clear and healthy. Pressure upon the bladder gave her some ease. As she had constant sense of heat in the urethra, though not the least discharge, Mr. HEAVISIDE kindly directed her to use a sedative lotion, and it much relieved her.

Some months after she visited a physician, who thought her complaints arose from stone. At his suggestion a surgeon in the neighbourhood sounded the bladder, but no stone was found, though the operation proved extremely painful. The uterus examined, was apparently healthy. Her complaints became progressively worse.

April 5. 1821. The bearing down pains were so violent, as in every respect to resemble those of labour; the women said they were precisely as if a child was forcing its way through. Indeed, during the severity of the paroxysm she cried and screamed vehemently, and could not be satisfied that something was not forcing through; till a female friend having examined, assured her to the contrary. Towards night she became easier.

About this time she became subject, for several weeks, to pains in the loins, passing down the ureters to the bladder; these pains most severe upon the right side, were extremely acute in the urethra, as if knives or needles pierced it in every direction. Coming on in fits, it returned for a few minutes, as often as she passed water. If one severe paroxysm lasted ten minutes, the next would continue only two or three, and so on.

July 6. The urine perfectly clear, was voided about every half hour. To allay the irritation and bearing down, still the most urgent symptoms, she

was directed by Dr. JAMES to take 30 drops of tincture of opium, with the same quantity of tincture of hyoscyamus, in a little water, every six or eight hours. These remedies, occasionally modified or changed for other opiates and anodynes, with constant attention to the bowels, formed the basis of her future treatment.

July 7. I found her in a violent fit of nervous tremor and agitation, moaning with pain, having just voided her urine. She entreated me to think of some means of relief.

July 13. I tried a solution of four grains of opium, in four ounces of water; two ounces and a half of which solution I injected warm into the empty bladder. The first effect was the instant production of violent pain and screaming. In three minutes I allowed her to evacuate the contents of the bladder. This she did with facility, and soon became much easier. Towards evening she felt unusually comfortable; and during the next day, in passing water, and in the intervals, was infinitely better than before the operation.

About this time a small semi-transparent cloud appeared suspended in the urine, somewhat resembling the albuminous matter or fluid white of an egg, without any mixture of yellow, opaque, coagulated, or purulent matter.

July 21. Only disturbed once in the night, to pass water, so much was the irritability relieved; the pains remained much as before. The medicines were continued, but her dread of present suffering induced her to hesitate, when the repeating the injection was mentioned.

During *August* and *September*, she remained much the same, except that her strength manifestly declined.

September 27. She was directed to introduce, per vaginam, a rolled pill, containing one grain of opium, and three of the extract of hyoscyamus. This application was repeated, but as it each time

induced very severe pain in the urethra and bladder, it was laid aside.

October 9. The complaints about the urethra and bladder much easier, sometimes her urine passing almost without any pain; she, however, complained that her hips were becoming sore, from laying.

October 18. Much weakened, by an attack of diarrhoea, which, by medicine, had been relieved; she complained most of her hips, upon which, notwithstanding every care to prevent it, painful ulcers had formed.

November 6. A return of diarrhoea was again relieved by medicine. The original distress and pain in the urethra had returned, bad as ever. The urine also, of late, had thrown down a matter similar to that formerly noticed. She continued to decline, became excessively emaciated, and upon *December 20*, was happily released from her sufferings.

On examination, the stomach and bowels sound; the latter, in parts, bore traces of irritability. The rectum, uterus, and bladder, removed; the right ureter, where divided, was found to be greatly thickened, apparently from the deposition of a pulpy matter in the cellular texture between its coats. The uterus was healthy; but the Fallopian tubes were indurated, and in the right, was a small granulated bony tumor, the size of a pea. The ovaria were indurated, but not enlarged. The bladder externally felt healthy. On laying open the urethra, its inner membrane was of a very dark colour, from excessive vascularity. I examined the mucous membrane of the bladder with great care; it was uncommonly fine and transparent. Its folds, in some parts, seemed, at first, to be covered with blood; but, on close inspection, it proved that the blood effused at certain points behind the membrane, had protruded it inwards, giving an appearance resembling small fungous processes.

The surface of the mucous membrane, examined

with a glass, was found in many parts, and especially towards the neck of the bladder, removed, in minute, ragged, ulcerated spots. The inner membrane, however, was so fine, and the cellular texture of the ulcerated parts so little discoloured, that the real state of the cavity would have escaped notice, had not the edges of the ulcerated portions been, in some points, of a darker shade, and perceptibly elevated above the general surface.

The right kidney, considerably enlarged and diseased, had its pelvis and infundibula converted into so many cysts; and from the pelvis, thickened, but scarcely enlarged; the diseased change extended along the ureter, producing thickening of its coats. Like the cavities of the kidney, the canal of the ureter was, through its whole length, lined, and almost filled, with a soft, tenacious, yellowish coloured matter.

The section of the kidney exposed the diseased state of its cavities; the deposit of the above-mentioned matter, every where upon its internal surfaces, and also to a certain extent disease of the substance of the kidney, proceeding in my opinion from these surfaces, by a secretion into the cellular texture of a pulpy matter, similar to that with which the cellular substance of the ureter was loaded. I was more particularly led to this conclusion, by the most careful examination I could make failing to discover, in any part, the least remaining trace of the mucous membrane lining the infundibula; a circumstance, which, considering the ease and freedom with which most of the pulpy matter admitted of removal, could, in my mind, only be explained by assuming that even the fine laminæ of that membrane were dispersed and lost, in consequence of the secretion of pulpy matter having been deposited within its cells and between its laminæ, as freely as upon each of its surfaces. *

* The diseased kidney, ureter, and bladder, are preserved in Mr. HEAVISIDE'S Museum.

CASE 9.

Extraordinary Disease, probably of Kidney.

A YOUNG lady, aged 24, first observed an enlargement in the abdomen, in 1816, slowly increasing, till it equalled that of an eight months' pregnancy; which tumor, with occasional variation, remained. *November 5. 1818*, she first had retention of urine, for which, a catheter was passed, and two quarts of water drawn off. The instrument was regularly introduced, but the quantity of urine decreased, so that on *November the 10th*, only a dessert-spoonful passed. This state of things continued till the 8th of *December*, while powerful medicines were given, the warm-bath tried twice, and electricity four times, with little benefit, as there never was more than an ounce or an ounce and a half of urine drawn off every two or three days. But on *December the 8th*, a sudden influx took place, and lasted 20 days, during which 17 gallons, and half a pint of water passed from the bladder by the catheter. *December the 29th*, the urine again ceased to flow into the bladder, and so continued till *March the 2d, 1819*, except on two days, (the 1st and 2d of *February*,) on which days, one pint a day was drawn off. From *March the 2d* to *April the 6th*, a tolerably natural quantity of water was voided by the catheter. From *April the 6th* to *May the 30th*, no water flowed into the bladder. The catheter passed once in two or three days, scarcely a tea-spoonful was ever found. Towards the close of this period, however, a new change took place, for, *May the 25th*, a discharge of water came on, by the bowels; and between the 25th and 29th, 16 pints of water were passed. This ceased the day before the next influx into the bladder, which, as before stated, was on *May the 30th*. The discharge of water from

the bladder now continued till *June* the 10th. During this period, ten and a half gallons of water passed, most of which was forced from the bladder by violent spasms. The cessation of flow into the bladder had returned only two days, when the urine again found its way by the rectum, and so continued till *August* the 12th, during which time, seven and a half gallons were voided. An influx now again took place into the bladder, and continuing six days, near eight gallons were drawn off by the urethra, and one and a half gallons passed by the bowels. After the water ceased to flow into the bladder, ten and a half pints again passed by the bowels, five and a half on the 19th, and five on the 20th of *August*, when the retention returned, and no urine passed either way, till on *September* the 8th, she wrote to Mr. HEAVISIDE "That she could not help fearing, from her present sensations, that an influx was again about to take place in the course of a day or two." — *September* 14. Within the last three days, the influx having taken place as she predicted, twenty two quarts were passed from the bladder in occasional spasmodic gushes. — *December* 6. For four days in the last week, she passed two gallons of urine a-day by the rectum, while for the preceding fortnight, not two table-spoonfuls in the whole either passed by the bowels, or reached the bladder.

May 21. 1821. Mr. HEAVISIDE said she remained just the same; sometimes not voiding a quarter of a pint in a fortnight, and then either by the rectum or bladder, three or four gallons in a day.

August 17. 1822. Mr. HEAVISIDE acquainted me the above complaints remained much the same, the general health being perfectly good. Sometimes two gallons of urine a-day were voided by the bowels; and sometimes when the influx had taken place, unless regurgitation occurred, the urine was

obliged to be drawn off, four or eight ounces in the day; but if the influx happened in the afternoon, and her surgeon was prevented calling the same evening, by the next morning regurgitation had taken place, and not a drop was found in the bladder. This had happened very frequently.

CHAP. II.

ON THE MORBID APPEARANCES OF THE URINE.

SECT. I.

On the Appearance of Blood in the Urine.

70. **R**ECENT hæmorrhage from the urinary passages, however small the quantity of blood lost, may be readily distinguished by its bright or scarlet colour from any other appearance in the urine.

71. Blood passed by the urethra, may be derived either from the kidneys, the ureters, the bladder, or the urethra. Where bleeding proceeds from the kidneys, it most commonly depends on some injury to their internal cavities, from renal calculi lacerating the fine arterial branches. Sudden or violent exercise or exertion, under these circumstances, generally operates as the exciting cause; and this may be the case whether a calculus is situated in the kidney, ureter, bladder, or urethra; wherever the irritation from stone exists in the urinary passages, there will be increased vascularity, and a perpetual risk of hæmorrhage, from the slightest cause.

72. The presence of blood in the urine, however, even where it may be fairly concluded to come from the kidneys, affords no positive proof either of injury from calculi, nor rupture of blood-vessels. In scurvy, when blood has been effused from the exhalent arteries into the cellular membrane, under the skin, and also into the bowels, the capillary vessels in the kidneys have also allowed the blood to escape with the urine; and in these cases I have uniformly found the affection of the kidneys relieved and removed by the same means that restored the constitutional health of the patient.

73. The secreting vessels of the kidneys have, in some instances, been known to pour out red

blood, however, without any direct evidence of the existence of a scorbutic diathesis. A very remarkable example of this hæmorrhagic disposition, is related by Dr. BANYER, in which vast profusions of blood were first evacuated by stool, on the return of the vernal and autumnal equinoxes, regularly for the space of three years, when the tendency left the bowels; and on the return of the period, the kidneys took up the action, and resumed it regularly for two years longer. An extremely curious fact in this case was, that whether the attack fell on the bowels or kidneys, it invariably continued seven days, and then ceased spontaneously. The discharge by the kidneys in the paroxysm was generally blood only, but on one occasion the urine for three days was only coffee-coloured, but afterward for four days longer every discharge resembled an effusion of blood from a vein just opened.* Such cases, however, are rare, and where considerable hæmorrhage is the immediate consequence of some unusual exertion or strain, it most commonly arises from rupture of blood-vessels, whether calculi are present or otherwise. (Case 10. and 11.)

74. It has happened also, though very rarely, that hæmorrhage has taken place from a cancerous or fungous tumor growing from the internal surface of the pelvis of the kidney. A specimen of this disease is preserved in the Museum of the Royal College; the tumor which had produced bloody urine twelve years, is equal in size to a large walnut, and of similar structure to the fungous tumors sometimes met with in the cavity of the bladder. (Case 34.)

75. A discharge of blood perhaps never takes place from the ureters, unless, from the previous irritation of calculi, they have become highly vascular, and then suffered injury; in a healthy state their supply of blood is not such as to furnish the means of notable hæmorrhage; but where the pa-

* Phil. Trans. vol. xlii.

tient labours under cancerous or fungous disease of the bladder (Case 35. and 36.), or where an enlarged or varicose state of the vessels about the neck of the bladder exists, bleeding may at any time arise.

76. Bleeding from the urethra frequently arises from the passage or lodgment of a calculus; it sometimes takes place from the use of caustic in stricture, from the forcing a passage through a stricture, or the laceration of some part of the canal. (Case 61.) It is not an uncommon occurrence in the inflammatory stage of gonorrhœa, particularly during the violence of chordee; and is generally the first consequence of violent contusion of the parts. (Case 48. and 49.)

77. From the symptoms, it may be generally determined with tolerable precision, from whence the bleeding is derived. Where hæmorrhage proceeds from the kidneys, it is frequently preceded or attended by pain or sense of fulness in the region of the loins, although, if the blood passes by the capillary arteries, this may not always be the case. In those affections where the loins have previously suffered by external violence, there can be no difficulty. Should the preceding history show the probable existence of renal calculi, the appearance of blood will be at once referred to its proper source; and where bleeding takes place from the ureter, in consequence of a stone passing down, attentive consideration of the symptoms will generally remove any doubt. (Case 22.)

78. A diseased state of bladder is always, as far as I have seen, attended by direct symptoms; whatever the complaint may be, pain in the seat of the bladder, and some disturbance to its functions, lead the attention to the part. When, therefore, hæmorrhage is derived from this cavity, the cause may frequently be ascertained, or at least the real seat of the affection pretty accurately determined.

79. Where blood flows from the vessels of the urethra, it may be generally known by the hæmorrhage either coming on, or continuing, independent

of the act or desire of voiding the urine; the blood is also usually pure, and unmixed with the urine; and on standing, forms a coagulum, bearing a just proportion to the serum, as in healthy blood. Now and then, however, these appearances are not to be relied upon, for M. DESAULT observes what I have myself more than once seen, that occasionally, either from a coagulum forming, or from some other cause, blood poured out into the urethra will flow backward into the bladder; it will then induce another set of symptoms, and thus be very apt to mislead the judgment.

80. Blood passed with the urine, if in minute proportion, will merely impart a scarlet blush to the urine; when, however, any quantity has flowed into the bladder, unless voided immediately, it forms a coagulum, and the efforts at expulsion will then fail. In this state of things, the retention of urine is not the least common nor the least serious consequence.

81. In one instance of this kind the bladder was completely filled with blood, by a vessel rupturing into its cavity. The patient, an old East India Director, had been long subject to nephritic complaints. He was attacked with what was at first supposed a retention of urine, and a catheter was repeatedly introduced, but it was suspected it had not passed into the bladder, as no water flowed, although there was manifest tumor in the seat of the bladder. Under this doubt, Mr. HEAVISIDE was sent for from London, who upon feeling the tumor, said he thought it blood; upon introducing the catheter, he was confirmed in his opinion. His patient died the following day, and on examination, the cavity of the bladder was found entirely filled by a very large coagulum of blood, which had evidently flowed from some part of the surface of the diseased inner membrane; for on examining the kidneys, the one was much wasted and extremely small, the other much enlarged, and from obstruction converted into cysts by over distention; but neither

in the kidneys or ureters was there the least trace of effused blood.

82. In another case a gentleman was supposed to have died of an obstruction from inflammation at the neck of the bladder. On opening the body, the kidneys were found studded externally with small yellow cheesy tubercles. The pelvis of one kidney was much enlarged, the ureter having been obstructed below by a great quantity of coagulated blood in the bladder, almost filling it. Some part of the coagulum was very firm, and adhered to the inner surface of the bladder. In the midst of the coagulum was found a stone, of irregular figure, and as large as the top of the thumb. Before death, it had been attempted to introduce a trocar, but the coagulum prevented the urine flowing, although a little dropped away occasionally.*

83. Of a similar description with the above, is an interesting case recently published by Dr. BYRON, in which a very large coagulum of blood deposited in the bladder, was first washed asunder, and then by means of a large silver catheter, and an exhausting syringe, progressively drawn out, until a quantity of fragments of coagulum were collected, to the amount of more than twenty ounces. It is to be lamented that such judicious and persevering exertions should have failed to save the patient, and also that leave could not be obtained for examining the body after death.† A case in which, from gunshot wound of the bladder, that viscus distended with blood and urine, was apparently relieved by passing an elastic catheter, and by the injection of emollient fluids into its cavity, favoring the discharge of coagula of blood, and other contents, and thus removing the alarming symptoms, is mentioned by M. LARREY, as related by M. MARTIN.‡

* From a MS. of Mr. WATSON'S, in Mr. HEAVISIDE'S Museum.

† Dublin Hospital Reports, vol. iii.

‡ Mém. de l'Académie des Sciences. Année, 1725.

84. Many other facts also are before us, to strengthen favorable hope under these circumstances; for Sir E. HOME has shown, that where blood flowing into the bladder mixes with the urine, the whole forms one coagulum, which, if large, may for many weeks suspend the power of voiding the urine, and consequently require the catheter; that in the course of that period, the coagulum suffers change, the flow of urine washing away the red globules, and depositing also a large quantity of a white powder, which continues to appear till the whole of the coagulum is removed; and as this happens, the bladder progressively reassumes the power of expelling its contents, together with the other functions of perfect health.* I have had one case of this description, that terminated extremely well; although the constitutional health rendered the patient but little assistance. (Case 12.)

85. The serious importance of hæmorrhage from the urinary organs, is rarely derived from the quantity of blood lost; it generally consists in its forming an indication of the existence of some particular disease, which is in itself of a serious nature. Where blood in the urine arises from wound either of the kidneys or bladder, unless the flow of blood is very free, the hæmorrhage under proper care may cease, and the patient do well. Where bleeding is dependant on calculous disease either in the kidneys, ureters, or bladder, the importance and probable result may be dependant in some degree on the quantity lost, but much more on circumstances less evident; the exact state and condition of the particular part suffering from irritation, together with the size, form, and composition of the irritating body, or stone. This kind of hæmorrhage, considered as purely the effect of accident, severe horse exercise, or intemperance, loses much of its importance; but viewed as a symptom of confirmed disease of kid-

* Phil. Trans. vol. lxxxvi.

ney, or fungous tumor, or fungous hæmatodes of the bladder, it must excite very serious apprehension for the eventual fate of the patient.

86. The appearance of blood in the urine, as it always indicates some morbid affection either of kidney, ureter, bladder, or urethra, will require only those curative means best calculated to remove or relieve the disease that brought it on; these means will be explained under their proper heads. When, however, blood effused into the bladder in quantity forms a coagulum, it may, and most probably will, be necessary to adopt some means for facilitating its dissolution and removal. The existence of a coagulum may be suspected where the appearance of recent blood in the urine quickly subsides, giving place to a heavy chocolate-coloured sediment, while the irritation and frequent desire to void urine continues. The train of symptoms consequent to this accident, will be entirely dependant on the quantity of the coagulum, the healthy or diseased state of the bladder, and the condition of the kidneys. The presence of a large coagulum seems occasionally to operate, by exciting a peculiar irritation, inducing suspension of the secretion of urine, and thus destroying the patient. Whenever there is ground to suppose a coagulum deposited in the bladder, in connection with uneasiness and irritation, with scarcely any power to void urine, there will be ground for apprehension as to the event, and every reason for activity and exertion, in trying those means by which, without offence to the tender and irritable surface of the cavity of the bladder, we may break down, or in some measure assist in favoring the dissolution and removal of the contained blood.

87. Of the means, calculated to assist in dissolving a coagulum, and enabling it to flow off with the urine, the most safe, and harmless, perhaps, is the injecting into the bladder, by means of a catheter, a quantity of warm water, previously rendered per-

fectly soft, by the addition of a little alkali ; or, as M. DESAULT recommends, water that is slightly alkaline. The longer this can be retained the better. The passing an instrument with a view to break down the coagulum, is another expedient proposed, the usefulness of which, I should think, in some cases, might prove considerable. I should previously examine the bladder from above the pubes, and by the rectum, and then select one of the smallest silver catheters, as being capable of most free motion in the bladder, and, therefore, conferring the greatest degree of the required power. Every movement of the instrument should be conducted with the greatest caution, and the patient being desired to say, when it gives pain, the same exact direction should not a second time be given to the point, especially if there is any suspicion of the bladder itself being unsound. The movements of the catheter may, according to circumstances, be more freely made in one case than in another ; provided these are not painful, the parts may not sustain any injury, or even inconvenience. The smaller instrument withdrawn, the largest silver catheter may now be passed, and probably some urine will flow. Provided the bladder is not painfully distended, some tepid or alkaline water may perhaps be injected with advantage, by the catheter, this will sometimes return, and bring with it broken fragments. If the stream suddenly stops, it is most likely in consequence of coagulum stopping up the openings of the instrument, and this seems to me the favorable moment for assisting our efforts, by adding the carefully applied power of an exhausting syringe, as in Dr. BYRON'S case. The application of this power, however, requires, in my opinion, some precaution. In the first place, the piston of the syringe, well oiled, should move with perfect ease, that the operator may accurately know the exact measure of force applied, which ought to be moderate as possible ; in the next

place, as all the risk is that of the coats of the bladder, coming in contact with the eyes of the instrument during the act of exhaustion, care should be taken, that the mind's eye be steadily kept upon the extremity of the instrument, which should be so placed, that its openings may project one or two inches only into the middle of the cavity of the bladder, which, if much distended, will then be in no risk of sustaining injury. (270.)

88. During the time that any part of a coagulum remains in the bladder, should there exist any disposition to calculous deposition in the urine, such coagulum may become the nucleus of a stone. This important circumstance should suggest additional attention, in these cases. In the first place, the history of the complaints should be completely ascertained, to clear up any doubt, as to the present or past existence of any tendency to gravel, or stone; and, in the second place, if it should appear that the patient is or ever has been subject to gravel, the diet should be rendered extremely temperate and simple, and the stomach and bowels be constantly watched; that by the seasonable direction of light bitters, and the continual use of gentle aperients, that peculiar state of indigestion and confinement, which most essentially favors the calculous diathesis, may be prevented.

89. A curious case is mentioned by M. DESAULT, as having occurred to M. ROUX, in which the exact colour of blood continually existed in the urine, without any one being able to understand, or remove it; until M. Roux, suspecting it could not be blood, questioned more closely, and discovered that the patient supped every night on red beet-root. This laid aside, the urine resumed its healthy colour.

CASE 10.

Renal Hæmorrhage.

January 15. 1821. A robust weak female, aged 68, requested to see me on account of some complaints affecting the bladder. She had been a fortnight confined with a heavy winter cough, for which aperients, antimonials, and other medicines had been directed. On the 12th, sickness and vomiting came on, and pain in the loins followed. The urine next passed was of a deep crimson colour, depositing a rather copious sediment of red blood. The sickness relieved, the appearance of blood in the urine continued, though to no very material extent.

When the uneasiness about the loins became somewhat better, pain in making water came on, and, especially, just as the bladder was emptied; she also observed, that the flow of water was occasionally checked suddenly, as if something stopped up the passage.

January 15. Several small soft masses, of a pale red colour, and about the size of small gooseberries, were observed to have flowed with the urine, from the bladder; these substances appeared to be remnants of macerated coagula. There was no material frequency of desire to void the urine, but there was decided tenderness to pressure about the seat of the bladder.

Appearances, nearly similar to the above, were noticed in the urine upon a former occasion, a year and a half previous to the present attack. They were then attributed to cold, were unattended with local pain or uneasiness, continued a fortnight, and disappeared spontaneously. The present attack, also, declined very favorably; by attention to the bowels, and the exhibition of light tonics, within three weeks the patient had recovered.

CASE 11.

Renal Hæmorrhage, from external violence.

A MAN, aged 67, brought home ill, in *May*, 1820, said he had hurt himself in lifting a porter's load. He complained of pain in his right side. Blood came freely with his urine on the same day, the coagulum formed being equal to one-fourth of the whole quantity of fluid voided. In a few days the bleeding subsided, and did not re-appear till the end of August, when the pain in the loins returned, and fluid, with clotted blood, again flowed with his urine, at least as copiously as at first, and with more distress, from wind at the stomach.

Sept. 6. The renal hæmorrhage still continuing, he complained of much increase of pain in the loins. On the 11th, having taken some broth, he felt sick, and, in half an hour afterwards, threw up a pint of fluid, most of which was blood; the bleeding from the kidneys not then being upon him.

At this time, being requested to visit him, I found the pulse strong, but intermitting. His bowels were regular, but he had not since the accident been able perfectly to retain his water. For the last fortnight he had been dull and stupid, and was now exceedingly disposed to sleep; even when his eyes were open, he could not see a person come into the room with a candle. The tongue was foul. I directed some medicines, which, however, his daughter neglected to give, and the following night he died.

The family would not, by any persuasion or argument, permit the examination of the body.

CASE 12.

Renal Hæmorrhage, and large Coagulum in the Bladder.

Dec. 28. 1818. I was desired to visit a lady, aged 65, alarmed by an appearance in her urine, which, the following day increasing, was evidently blood, a part coagulating at the bottom of the vessel. She complained of a settled pain in the left loin, shooting downwards; which pain had commenced a week before in what was supposed a bilious attack, with vomiting and extreme nervous agitation; most of these symptoms, however, were soon relieved by brisk cathartics.

An appearance, similar to the present, she said, she once had, in the 30th year of her age. It then arose from a playful effort to lift a young lady from a sofa. Blood then came, sometimes freely, for the space of nearly six months, and was of a uniformly bright colour, through the whole attack. Her physicians prescribed various medicines, containing alum, extract and decoction of logwood, and other astringents; but the complaint yielded, at last, to the internal use of recently dried, and finely powdered, peach-leaves. Towards the latter part of that attack she had pain, similar, in kind and situation, to that she now felt, neither producing pain in voiding, or difficulty in retaining her urine. Pulse natural; at 60.

Finding the bowels acted regularly, I directed the Bals. Copaibæ to be taken at regular intervals; which in a few days relieved, and soon removed the complaint. A slight return, a few weeks afterwards, disappeared, upon taking the recent citric acid, in lemonade.

Oct. 24. 1821. I was called up to visit this lady, who, during the night, had passed her water with some pain, in small quantities, and of a florid red colour. The proportion of coagulum, forming about one-sixth of the whole, lay like a filamentous

tuft at the bottom. Bowels and pulse regular. No uneasiness at the loins, and scarcely any soreness or tenderness about the bladder. This attack had followed a greater degree of exertion than common, in walking the preceding day. There was little pain, but so much nervous tremor and agitation, that it was scarcely possible to distinguish the feeble and irregular pulse. The skin, and extremities, were cold. I directed a warm anodyne, with ammonia and camphor, to be frequently given; which, with the aid of external warmth, restored the circulation, relieved the tremors, and removed the sickness at stomach.

Oct. 25. Complained of a severe catching pain in the direction of the right ureter, shooting occasionally up to the loins, and always commencing in an uneasy sensation in the bladder. Voiding the urine excited a smarting in the bladder, and this again, the pain in the side. She thought her old bilious symptoms at hand, still feeling sickness at the stomach, and a numbness extending down the thigh. She was directed first an aperient, and then an anodyne, with occasionally a little lemonade. Pulse very good, at 84. The blood in the urine had, in one small quantity, entirely disappeared; in the subsequent portions it returned, but of a darker colour, progressively deepening; no longer coagulating, but subsiding as a loose sediment, to the bottom. Fomentations to the side much relieved the pain.

Oct. 26. The pains in the course of the ureter, and the uneasiness in the bladder, nearly gone; the deposit of blood in the urine rather more considerable, and of a brownish red colour. Directed a light anodyne.

Oct. 27. The sediment in the urine still darker, its proportion smaller, and its texture a looser powder.

Oct. 28. I examined the urine voided within the last 24 hours. The first portion, passed at 4 P. M., was three and a half ounces, with a pretty free

sediment of the brown powder. The second, at 11 P. M., was three ounces, with much less deposit, hardly tinged. The third, at 4 A. M., was six drachms, with more deposit. The fourth, at noon, was one ounce, with still more deposit. The latter appearances made her extremely uneasy, under the idea that the bleeding had returned; there was, however, no difficulty in explaining them, to her comfort and my own satisfaction, as the natural consequence of moving a little about, by which the remaining part of the coagulum, formed in the bladder, which must have been to the amount of several ounces, was more freely broken down and washed away, with the urine.

Oct. 29. The appearance of blood in the urine finally ceased; and the patient soon after recovered her strength and health.

Feb. 1823. Remained well.

SECT. II.

On the Appearance of Pus in the Urine.

90. THERE can be no doubt of the importance of being able to distinguish purulent matter, when it makes its appearance in the urine. Few questions, however, are occasionally of less easy determination. Of practical writers, some appear desirous to avoid the necessity for laying down distinctions, upon which they cannot themselves rely; while others, less scrupulous, point out modes of discrimination, upon which no dependence, in my opinion, can be placed.

91. It is observed by M. DESAULT, that purulent urine does not, in every case, arise from disease in the urinary organs themselves; for that numberless observations show how readily acute disease establishes its crisis, by the medium of this appearance in the urine. The same author adds, that a great number of facts attest that matter deposited in the

lungs, liver, or any other part of the body, is capable of being carried by metastasis, to the kidneys, and evacuated with the urine. Now I have very often seen critical deposits in the urine, whether from fever or inflammation, but they have invariably consisted either of some variety of albuminous matter, generally of farinaceous appearance, or of a pink sediment, or otherwise of some modification of gravel; and as to the contents of abscesses being occasionally transferred from other parts by metastasis to the kidneys, into the urine, it may be very true, but it is nevertheless what I have never once seen clearly verified. Nothing is more difficult, perhaps, than to determine absolutely, that matter is actually formed, unless it can be examined and felt in the softening of an external tumor; and supposing its existence thus ascertained, and that it is afterwards removed by absorption, the urine throwing down at the time a copious sediment, it by no means follows that this sediment must be pus. In one instance where I had previously opened several abscesses about the knee-joint, another formed beneath the skin as before, and by waiting a little, about three ounces of matter did certainly, within a few days, completely disappear by absorption. It is presumable it was carried back into the circulation; but be that as it may, it was carried away from the knee-joint. I am not however, aware, whether in this case any concomitant change occurred in the appearance of the urine.

92. The doubts just expressed in relation to critical deposits by the urine, apply equally to many of the appearances that originate in irritation of the membrane lining the cavities either of the kidneys, ureters, bladder, or urethra. Where from inflammation, abscess of these parts takes place, and from breaking inwardly, the contents are evacuated with the urine, the matter will of course be, strictly speaking, purulent. In gonorrhœa, also,

I am aware the discharge, without breach of surface, is purulent, because I have seen, as well as others, that under the microscope, it is impossible to distinguish this matter from that of an abscess, the contained globules, as to number, colour, and magnitude, being precisely the same in both cases, that is, nearly similar to those found in the blood. But in most of those complaints in which the urine is clouded, in consequence of some irritation in the kidneys, the substance deposited will be frequently very apt to be mistaken for pus, while in fact, it only resembles it in colour. Examining some such urine very lately, I found the sediment extremely tenacious, of a deep yellow colour, and even consistence, circumscribed, partly suspended in the urine, like a little undulating cloud, and partly attached to the bottom of the vessel. It appeared to me a muco-purulent matter; but on the affusion of a quantity of hot water, the whole became slightly turbid: in a few minutes the fluid cleared, was poured off, and on examining the sediment, which answered to the quantity of the previously existing cloud, it proved to be a fine, dense, beautifully white, flocculent albuminous substance, before disguised, but now destitute of any trace of resemblance to purulent matter. (Case 13.)

93. An instance, in which it is most probable a discharge from the kidneys was partly of a purulent nature, occurred to the late Mr. WATSON. A West Indian three years before, coming to Europe for advice, had fever, in which the high coloured urine deposited a thin whitish matter, but in small quantity. This appearance continued two years and a half; when the sediment became more tenacious, and he was obliged to pass water every ten minutes, with great pain, before and at the time, but none after. Whenever the matter was collected, he felt uneasy till it was discharged. The symptoms, however, varied; sometimes he

could bear a large quantity of this matter to be collected, and discharge it at a long interval, when it was of a pale yellow colour; but when it was green (as it sometimes was green as grass) he was obliged to pass water at very short intervals. The acrimony and colour went together, the irritation being always greater, or less, according to these circumstances. After several months continued pain in the left kidney, added to the above, he visited England, and consulted Mr. WATSON. A course of calomel and sarsaparilla proved too stimulant, and was changed for the blue pill, which seemed useful. The quantity of matter lessened, and the water was passed at the lengthened interval of half an hour. This plan was continued some time, his health, appetite, and rest good; but the frequency of urine undiminished. Opiates always distracted him, and brought on strangury. Two or three times the water became perfectly clear of the sediment. When loaded, the recent urine was of a bluish colour, and turbid, but on standing, deposited its matter in the form of a thick ropy substance. Dr. FOTHERGILL was consulted, and directed the uva ursi, which disagreed, inducing strangury; from which he was relieved by an enema of milk, camphor, and a few drops of laudanum. He was, however, but little benefited permanently, by any thing done.*

94. The opportunities of examining urine in which the matter deposited is, properly speaking, purulent, are generally in cases where the fact is already rendered clear by the other symptoms; and consequently, the determining the nature of the deposit becomes unnecessary. In one very recent instance of this kind, a copious deposit of purulent and coagulated albuminous matter in the urine, occurred in a man in whom there were strong reasons for believing these appearances arose from

* From a MS. of Mr. WATSON's, in Mr. HEAVISIDE's Museum.

purulent disease of kidney. No medicines appeared either to relieve, or to influence the progress of his complaint; from the continuance of which, sinking into colliquative diarrhœa, he at length died. On examination I most unexpectedly found the kidneys and ureters perfectly sound; but an abscess formed within the psoas muscle, connected more intimately by thickening and disease of cellular membrane, to the lateral part of an otherwise healthy bladder, had discharged its contents into the cavity by a small opening, which thus passed off freely with the urine, by the urethra.

95. The importance, however, of not asserting, or admitting, the presence of ulceration in any internal part before it actually exists, is more considerable than may at first be imagined. Any consequence of irritation, any altered action upon a natural surface, it is pretty generally known may often be corrected; but if that natural surface is once broken up by ulceration, the probability of its restoration, or, in other words, the chance of a cure, becomes exceedingly diminished. Now, suppose a patient with irritable bladder, and the appearance of filmy albuminous substances in his urine, is told by a surgeon of high character that there is an ulcer in the bladder, and that those substances are the coatings of the ulcer, he is depressed, but not relieved. But should two other opinions fortunately coincide in considering his complaints derived from irritation only, and capable of being removed, he feels fresh confidence, his spirits improve, his constitution recovers the power of helping itself; and this state of constitution being, in my opinion, very often of more consequence than any medical treatment, it becomes evidently important to the patient's welfare that his case should not be set before him clothed in imaginary terrors; nor indeed should it be placed in any less favourable point of view than known facts will warrant. (Case 28.) There is rarely any necessity for con-

cealing the truth, indeed it may always be made known in proper terms, even when unfavourable; but where the actual circumstances remain conjectural, it appears to me a serious duty to avoid putting a strained construction upon every incident, or symptom; when the only effect can be to give it additional importance by setting it in the most unfavourable light, and the only object an idle affectation of superior discernment.

96. Where a sediment in the urine is actually pus, the more even consistence of the deposit, the manner in which it flows from side to side when the vessel containing it is moved, added to the ordinary colour of purulent matter, will afford some ground for determining upon its nature. In pure pus, the globules will be found under the microscope disposed to diffuse themselves equally in every direction, both before and after the matter is diluted in water. Nitric acid, dropped upon pus, renders the globules apparently somewhat smaller, producing also the appearance of a brownish opacity, but without any immediate disturbance to the even diffusion of the globules through the fluid in which they are contained. Rectified spirit of wine, dropped upon pus, disposes its globules in some degree to run together, partially adhering in clusters; the same effect is also produced by a drop of boiling water. These appearances do not occur in the modifications of albuminous matter. (107.)

97. With regard either to the general principle, or particular circumstances of the necessary treatment, upon the detection of purulent matter in the urine, it must be in every case entirely regulated by the seat and tendency of the complaint of which it forms an indication, and will therefore be referred to the particular heads under which it may be observed.

SECT. III.

On the Appearance of Albuminous Matter in the Urine.

98. ALBUMINOUS matter very frequently occurs in the urine; often indeed under circumstances that prevent its detection, unless by chemical analysis. The following remarks, however, are intended principally to apply to this substance, when from its existence in some peculiar state or degree of coagulation, it is observable as a sediment in the urine.

99. The most frequent and least important cause of this appearance is the occasional effect of common cold, in which, after a sense of weight and irksome uneasiness about the loins, the urine is voided turbid, but on standing deposits a greater or less quantity of fine whitish-coloured flocculent matter, not very much exceeding in specific gravity the fluid in which it slowly subsides; generally disappearing in the course of a few days.

100. Analogous to this appearance, is that which is observable upon the crisis of feverish indisposition. In these affections the sediment is generally tinged more or less decidedly either of a pink, or a dull red colour; the principal seat of irritation, in all these cases, I believe to be the mucous membrane lining the cavities of the kidneys.

101. An attack of gout is commonly productive of some disturbance to the circulation through the kidneys, being attended with a flocculent pink coloured albuminous deposit in the urine. It also occasionally happens, that from some accidental circumstance, the gouty action is in a more direct manner transferred to the kidneys, and the consequence is more considerable disturbance, or a complete suspension of their functions. (15.)

102. In one such instance, a young man afflicted with gout, is stated by Mr. WATSON to have had uneasiness in the loins, pain in the bladder, and some difficulty in making water. The urine be-

came thick, with a white viscid sediment; sometimes rendered very copiously, and with great pain. The sediment was often one-fourth the quantity of urine. After twelve days a remittent fever came on, and this continued forty days, reducing him to the lowest ebb. Bleedings, diluents, sedatives, and laxatives, were directed to no purpose; although eventually, nature alone conquered the disease. *

103. In another instance of this kind, a man labouring under gout in the foot, was obliged suddenly to remove the furniture out of a kitchen, almost knee deep in water; the gout directly left his foot, and with pain in his loins, so abundant an excretion of albuminous matter came away with his urine, that it threatened to prevent the passage through the urethra altogether: and in fact he became very soon dependent on the catheter, as from irritation at the neck of the bladder, retention of urine supervened. This was considered an instance of metastasis of gout to the bladder; but seemed to me rather an example of gout transferred to the kidneys, and the induced irritation of bladder was perhaps no sufficient warrant for a different conclusion: for if these complaints are observed with attention, it will be not unfrequently found that albuminous matter secreted by the kidneys, reaching the bladder, and from its superior specific gravity subsiding down towards the orifice of the urethra, excites a very sensible increase of irritation and distress, until the bladder, by the expulsion of its contents, obtains some interval of comparative repose. (93.) and (Case 13.) Neither is this fact of difficult explanation, as it has been shown by Dr. PEARSON, that the varieties of mucous secretions in expectorated matter differ exceedingly with regard to the proportionate quantity of potash, and soda, they contain; and that those kinds previously observed to have most power of exciting irritation,

* From Mr. WATSON's MS. in Mr. HEAVISIDE's Museum.

are the same now ascertained to abound most particularly in the alkaline salts. *

104. Upon this principle, perhaps, I was enabled to relieve the complaints of a middle-aged gentleman who visited me, from Aberdeen, in *May* 1817. Apparently robust, he had long been subject, without any known cause, to a discharge of yellowish white albuminous flocculi and shreds, sometimes with minute particles of red blood, in his urine; and sense of uneasiness or pain in his loins, and about the neck of the bladder. On examination, I found this matter sometimes very nearly resembled pus; but it was pretty evident, on slowly pouring off the fluid, that the varying state of the sediment was dependant only on the coarser or finer appearance of the flocculi. Aperients, opiates, conium, and other medicines were tried, but nothing succeeded near so well as the recent citric acid, half an ounce every six hours. It greatly relieved the habitual pain at the loins, extending the interval of voiding urine from two to eight hours, and so diminishing the deposit, that the only remaining appearance in the urine was that of a little fine substance like hair-powder. This medicine, after being continued two or three weeks, was laid aside, as the improvement ceased to advance; and there was reason to apprehend its further use might have been prejudicial. This gentleman left town in the following *August* for Southampton; and I had the pleasure of hearing, in 1822, that his health was much improved, and his old complaint nearly gone. Not unfrequently, albuminous deposits very similar to the above, are consequent either to injury of the kidney, by external violence; or to injury of its functions, from impaired nervous influence, as happens in paralytic affections. (Case 14.)

105. Deposits nearly similar to those just men-

* Phil. Trans. 1809.

tioned, are occasionally observed in the urine, from temporary irritation at the neck of the bladder; where there is every reason to believe that the membrane lining that cavity, continuous with that which invests the internal parts of the kidneys, possesses a similar power of secreting albuminous matter, variously modified as to appearance, composition, and tendency to coagulate. All that we can be said to know, however, upon the subject, is, that the same set of exhalent arteries which in health secrete only a limpid mucus, do occasionally effuse, under the influence of disease, coagulable lymph, or albuminous matter, so as to form either an even and compact coating firmly attached to the surface of the cavity of the bladder; or small and more loosely attached fibrous or membranous patches; or viscid tenacious yellow, white, or variously coloured matters, not attached at all, but subsiding in the urine; or sometimes again, small and almost transparent clouds, which being of the same specific gravity with the urine, neither fall to the bottom, nor rise to the top, but exhibit themselves suspended in the midst. (Case 8.)

106. A transparent and extremely viscid albuminous substance also occurs in the urine, not derived from affection of bladder, but from enlargement of prostate gland. According to my experience, in the former case, this appearance of transparent matter has been only occasional and transitory, furnished in small quantity, not perfectly pellucid, of low specific gravity, and not very tenacious; in the latter it is, on the contrary, a permanent appearance, furnished in much larger quantity, beautifully transparent, of high specific gravity, and so tenacious as to admit of being raised in threads several feet in length. M. DESAULT considers that "*Les urines glaireuses sont un symptôme propre aux affections de la vessie.*" A conclusion which I believe to be at variance with the general results of English practice; it may, how-

ever, perhaps, be explained by taking into account the difference of climate and modes of life in France and England; circumstances calculated to qualify the state of constitution, and influence the appearances of disease, as well as the functions of health.

107. Though its appearance may be extremely various, the characters of albuminous matter are in most cases so different from those of pus, as to render the distinction sufficiently obvious. The characters of healthy pus, already given (96.), will commonly enable the attentive observer to determine, with tolerable precision, whether a sediment in the urine is purulent, or albuminous. The albuminous matter deposited in the urine (Case 13.), was found under the microscope to resemble pus, in being made up of globules; but they differed from that fluid, in being prone to unite in clusters, instead of floating in a state of even diffusion. The addition of a drop of nitric acid rendered them not only more opake, but made them run still more forcibly together into parcels and clusters; the latter effect not being observed in pus. Rectified spirit of wine somewhat increased the opacity of these albuminous globules, producing the appearance of numerous short portions of lines. But although the magnifying power was considerable, it did not appear, viewed either by reflected or transmitted light, that these lines were formed by adherent globules; at least, I could perceive no trace of regular indentations, nor any the least opacity, where it might have been expected, in the points of union between the globules. One argument which, in my mind, favoured such a conjecture, was, that at first the diameter of these lines, and that of a globule, appeared to be about equal; this, however, failed, upon finding some that were equal to at least three or four diameters, instead of one. The affusion of boiling water converted this albuminous matter from a semi-transparent, yellow, vis-

cid, and tenacious mass, to an opaque, white, flocculent substance in fine flakes, exhibiting the appearance of coagulation; which change, under the microscope, seemed to consist in little else than a strong disposition in the globules to attract each other into masses and clusters.

108. With regard to the treatment of diseases that manifest themselves by albuminous deposits in the urine, there still remains much to learn. These appearances are, in fact, derived from so great a variety of sources, and are in so many instances secondary consequences only, as rarely to claim the attention due to primary complaints; when, however, this attention is called for, it must be paid by a diligent enquiry into the history; from the circumstances of which it will generally appear that the membrane lining the internal parts of the kidney is probably labouring under some irritation, independent of ulceration, or calculous tendency. Under these circumstances, I have occasionally found various medicines useful, although it is extremely difficult to lay down any general rule for their application. In one instance, opiates and other anodynes were sometimes conducive to comfort, but the most powerful and permanent relief was derived from the recently expressed juice of the lemon. (104.) In other instances, no medicines have appeared to me capable of making any decided impression. Tonics, in general, I am inclined to believe, are among the most useful means. Preparations of steel, particularly the muriated tincture, have obtained, in these complaints, a very high character with some excellent practitioners, particularly with Dr. HOOPER; and I have certainly sometimes, though not often, directed them with advantage.

CASE 13.

Albuminous Matter in the Urine, from Irritation in the Kidneys.

A MAN aged 56, subject many years to occasional uneasiness at the loins, with pain, and desire to

pass water, applied to me in *August* 1822. The urine was to appearance healthy, but the urgency to pass it, if not instantly attended to, would either deprive him of the power of retaining it a single minute, or sometimes prevent, for a short time, his voiding any. He supposed these attacks of irritation, rarely continuing longer than a day, might arise from gravel, but he never saw any.

About a twelvemonth since, he had strained his loins violently, from which accident his back directly became painful, and, in a few days, his urine thick, depositing a whitish sediment. When pain increased in the loins, he always knew more sediment was at hand; he felt painful uneasiness extend down into the bladder, feeling less in the loins as he experienced more in the bladder, till at length, sometimes with exceeding pain, straining, and distress, he forced out the matter and "stuff," with his urine, and became at once easier. These complaints had remained to the present time, and for many months past, the uneasiness at his loins had been continual, and most distressing when lying down; so that sometimes, awoke from sleep, he was unable to remain in bed. He could not lay well on his right side, but for a few minutes; though he thought the left side of his loins the worst. He never had pain or numbness in the thighs, or testes; only at the loins, and thence to the bladder. A full-sized bougie passed freely into the bladder. The secretion of urine was natural in colour and quantity, but with it a whitish yellow, extremely viscid, albuminous matter was voided, mostly in the morning; the passing of which, was now, as formerly, preceded by more pain, and productive of more ease. The Bals. Copaibæ was directed in various ways for his relief, and persevered in for near a month, without benefit. The compound powder of ipecacuanha and other opiates also did no material good; but a medicine, directed by Mr. HEAVISIDE, containing nitrous

æther, and camphorated tincture of opium, of each a drachm, in a draught, taken night and morning, he thought gave him most relief.

September 17. 1822. I examined the albuminous deposit under the microscope, the appearances of which have been pointed out in a former part of these observations. (107.)

October 20. A blister kept open for a fortnight upon the loins, very nearly removed the complaint, permanently diminishing the deposit in the urine to one-tenth its former quantity, and relieving the other symptoms in the same proportion.

CASE 14.

Albuminous Matter in the Urine, from Paralytic Affection of the Kidneys.

June 1819. A thin woman, aged 43, lost her speech, and use of her right side and extremities, by an attack of paralysis. For her relief she was directed to take physic and visit the country, where she partially, and very slowly recovered.

March 1820. She complained of an acute and severe pain in the loins, particularly on the left side. This pain progressively increased, especially under exercise, when she found herself incapable of retaining her water. When the pain commenced in the loins, her urine turbid, deposited a sediment, which, variable in degree, had continued ever since.

The severity of pain about the small of the back generally came on in attacks of several days duration; and then for a week or ten days the pain in the loins, and the sediment in the urine, would diminish.

April 7. 1821. For the last three or four months, very infirm, she had been confined to her bed, and subject to much pain in the bladder, which was tender and painful on pressure, with an irksome sense of bearing down, and a constant desire to void the urine (now very thick) in small quantities.

April 21. The urine on inspection appeared to be freely secreted, and of healthy colour, but contained a considerable quantity of fine albuminous matter, which fell to the bottom, like hair-powder. The bowels very regular, the limbs extremely weak, and the head very painful: with a view to alleviate her sufferings, I directed twelve leeches to the temples.

May 12. The leeches had for some days much relieved the head, without the least apparent effect upon the kidneys; I therefore directed them to be repeated.

May 15. The last leeches had not only greatly and permanently relieved the headach, but with it the pain in the loins, the frequency in making water, and the pain in voiding it. She had before been disturbed every half hour through the night to pass urine, but was now awake only two or three times during that period. The pain in passing it, before extreme, was now much diminished; the quantity of sediment also, in the urine, was much less than before.

July 4. The pain and distress in the loins and bladder remained better; but a large slough forming on the sacrum, required the adoption of the usual means, and a proper course of medical treatment. For some time, she promised every improvement, but soon after her appetite fell off, she sunk, and died; but owing to the interference of a person whose influence I was not at the moment exactly aware of, I was prevented hearing of the event in time to admit of making any examination.

SECT. IV.

On the Appearance of Gravel, in the Urine.

109. THE morbid appearances already noticed in the urine, blood, pus, or albuminous matters, may occur either as the consequence of accident, or the

effect of disease. Other sediments, however, are also observed in the urine; which sediments, although liable to be produced from similar causes, differ in their origin and nature from the above. The former indicate, most frequently, either irritation or disease of some internal surface or cavity through which the urine flows; while the latter demonstrate some derangement in the functions of the secreting vessels of the kidneys, probably connected with imperfect assimilation of some of the principles of the blood.

110. For the present comparatively advanced state of our knowledge upon the subject of urinary concretions, we are principally indebted to the successive labours of Dr. WOLLASTON, Mr. BRANDE, Dr. MARCET, and Dr. PROUT; although it must be confessed, that with relation to the causes, symptoms, and treatment of several known varieties of calculi, our information still remains extremely imperfect.

111. The sediments in the urine, indicating the existence of a calculous diathesis, are observed to be of two kinds; occurring either in the state of fine impalpable powder, or in more or less perfectly crystallized particles or grains. These substances rarely appear alone, most commonly being mingled with mucous matters deposited at the same time, in consequence of irritation, either in the bladder or elsewhere.

112. One of the most frequent forms of the calculous diathesis, is that in which either a red coloured precipitate, in fine powder, is deposited as the urine cools; or a number of distinct, red, semi-transparent crystals, of nearly pure uric acid, are found in the urine. These crystals, when the excess of uric acid is strongly marked, I have repeatedly seen abundantly formed in the bladder, and passed with the urine; generally, however, the recent urine is clear, the crystals forming upon the

bottom and sides of the glass, in the course of the next twenty-four hours.

113. Under some circumstances, an excess of lithic acid may exist in the urine, producing irritation at the neck of the bladder, an occasional sudden and urgent desire to pass water, a momentary want of power of retention, and especially leaving a very peculiar and dull coloured red stain upon the linen, unattended for a time with any distinct precipitation of this substance in the bottom of the vessel. (Case 19.)

114. Where a deposit in the urine is a yellowish brown powder, Dr. PROUT, whose researches upon this subject have been laborious and successful, finds it to consist essentially of lithate of ammonia, tinged with the colouring principle of the urine, usually containing more or less of the phosphates, and sometimes a little of the lithate of soda. These sediments, however, although sometimes alternating with a deposit of gravel, so frequently occur from slight causes, as rarely to portend any material deviation from health.

115. When the colour of the deposit tends to a deep red or brown, it is found to consist essentially of lithate of ammonia, or lithate of soda, tinged with a large proportion of the colouring principle of urine, and more or less of the purpurates of ammonia and soda, sometimes with a small proportion of the earthy phosphates. Deposits of this kind denote active and inflammatory fever, or gouty action; and the deeper the colour of the urine and of the sediment, the more severe, in general, are the attendant symptoms. Where the feverish symptoms are connected with gout, Dr. PROUT has ascertained that the sediments consist chiefly of the lithate of soda, the tinging substance appearing to be purpurate of soda.

116. Sediments of a pink colour, consisting essentially, like the other varieties, of lithate of ammonia, differ from them in being almost entirely devoid of

the yellow tint derived from the colouring matter of the urine; indicating the absence of the large proportion of the colouring principle of the urine, they denote the secretion of a greater quantity of nitric acid, and the consequent formation of more of the purpurate of ammonia. These sediments occur in dropsical, hectic, and visceral diseases.

117. With regard to the source of the excess of lithic acid, when that substance forms crystals of gravel in the urine, there is some variation in opinion. Professors BRANDE and BERZELIUS do not appear in their experiments to have had any reason to think the lithic acid does exist in combination with ammonia. Dr. PROUT, on the contrary, has strong reasons for believing, that the kidneys naturally secrete lithate of ammonia, and that sometimes a free acid also generated in the kidneys, by combining with the ammonia, precipitates the lithic acid in the state in which we see it; a view which does not necessarily imply any excess in the secretion of this principle. All, however, agree, that lithic acid in a free state forms one of the constituents of healthy urine: and the determination of the doubt is, perhaps, of but little practical importance; as the principle of treatment for the relief of the complaints to which the appearance of the lithic acid in the urine gives rise, remains much the same in either case.

118. With regard to the causes of this complaint, it may be observed, that any irregularity or excess in diet, a paroxysm of fever, excessive exercise of body or mind, or any other circumstances that induce debility, will occasionally bring it on.

119. If it be true, that all these various causes may operate upon some one common principle, their agency would appear to be derived from impaired energy in the functions of digestion and assimilation; and from what I have seen of these diseases, I am disposed to think, that in the great majority of cases, this opinion is founded in truth.

In some instances, however, I cannot resist the belief, that temporary disturbance of the circulation through the kidneys, from fatigue in travelling, may derange the functions of these organs without the intervention of any affection of stomach or bowels. (Case 25.)

120. The symptoms I have commonly seen attend these deposits, either in the state of powder, or of gravel, have been more or less constant uneasiness, or considerable pain in the loins, sometimes with feverish heat, thirst, and quick pulse, generally a degree of irritation at the neck of the bladder, and now and then an occasional sudden necessity to void urine, with a transitory loss of power to retain it. (Case 18.) Where uric gravel is deposited in quantity, there is generally also a manifest decrease in the quantity of urine, which may in some instances go on to produce complete suppression. (Case 3.)

121. Where these sediments occur in the state of fine powder, Dr. PROUT considers the lighter coloured, and the pink, as the worst appearances; the former denoting, in general, a tendency to the phosphates; the latter indicating some organic or other deep-seated disease.

122. In what relates to the treatment of the lithic acid diathesis, whether the sediments be uncrystallized or amorphous, or whether they contain distinct crystals of lithic acid, one of the first principles is the proper regulation of the diet, and a strict regard to temperance.

123. The occurrence of the first-mentioned variety of uncrystallized or amorphous sediment (111.), will, as Dr. PROUT observes, exhibit scarcely the least disturbance in the health, requiring little attention as regards medical treatment, although, from its manifesting a strong tendency to the lithic acid diathesis, it will need restriction and care in diet and exercise. Moderation in the quantity of food taken is of the first importance, but it

is, nevertheless, with some patients a precept, the due observance of which it is extremely difficult to enforce. (Case 25.)

124. Plain roast and boiled meats, with fresh vegetables, are unexceptionable; but the free use of pastry, especially hard and coarse dumplings, or badly fermented flour in any form, are found, by Mr. BRANDE and Dr. PROUT, to produce an increase in the complaint, and an immediate aggravation of every symptom.

125. Fruits, and wines, if acescent, are bad, and should be carefully avoided; but the observance of a regular, moderate, and easily digestible diet, the taking proper exercise, and especially the keeping up a regular and free action of the bowels, will, in most cases, include every necessary attention.

Observation, however, has repeatedly led me to the same conclusion with Dr. MARCET, who is inclined to consider the great tendency to acidity in calculous complaints rather in the light of a dyspeptic affection, arising from irritation in the urinary organs, with which the stomach is known to sympathise, than as the original cause of calculous disorders. (29.)

A female, at present under my care, long subject to this complaint, has remarked, that although, in general, the quantity of her urine is large, yet, if ever she takes a glass of stale porter, the bowels presently become tense and inflated, the habitual distress about the loins much aggravated, the urine loaded with mucous matter, and secreted very sparingly, or scarcely at all, for a few days, till by castor-oil the bowels are opened, and she is relieved. (Case 22.) Upon this point it has been remarked by Mr. SPILSBURY, that, in country practice, it is not very uncommon for a man in the decline of life, after a debauch of hard ale, to send to have his urine drawn off, saying, his bladder is full, and he can make none; in great pain, with flushed face, foul tongue, urgent calls, tense and tumid belly, yet

no circumscribed tumor. On passing the catheter, the bladder is found absolutely empty; but, upon bleeding, purging, and restricting the diet, the secretion returns, and the complaint subsides.

126. A very pale-coloured sediment, if induced by the slightest cause, is considered by Dr. PROUT an unfavourable appearance, from its denoting a feverish irritability of system, bordering on that which accompanies the phosphates. The treatment appropriate to this kind of deposit will be presently mentioned; that of the other varieties of amorphous sediments, usually indicating some degree of febrile action, must be regulated by the turn of the symptoms, and the particular disposition of the disease.

127. The preventing the continuance of a deposit of crystallized lithic gravel in the urine, is observed by Dr. PROUT* to be commonly a work of some difficulty. With a view to this object, the regulations already laid down with regard to diet should be most strictly attended to; in addition to which, occasional aperients, combined or alternating with the use of the alkalies, either the carbonate of soda, or of magnesia, may be directed, according to circumstances. This plan, subject to occasional variation, must be followed up with patience and perseverance, being carried forward for some time after the disappearance of the symptoms.

128. Should constitutional irritation prevail, the preparations of opium, or hyoscyamus, may be directed with advantage. Where, however, gouty or inflammatory action takes place, the acetum colchici, has been, by some practitioners, recommended; but, in affording present alleviation to the symptoms for which it has been directed, I am of opinion, that it generally, sooner or later, injures the constitution, and is a deceitful and dangerous remedy that should never be employed.

* Inquiry into the Nature and Treatment of Gravel and Calculus.

129. Where the attack is violent, and attended with feverish symptoms, the treatment must be active. Dr. HOOPER judiciously observes, that sometimes an inflammatory tendency may require fomentations, the local abstraction of blood, and other antiphlogistic measures. * Cupping-glasses, or leeches, may be applied to the loins, and the warm-bath used, while the bowels are gently opened. Dr. PROUT remarks, that if, after such means as these, diuretic purges and the acetum colchici are properly directed, they will seldom fail to remove inflammatory or spasmodic action of the kidney, and produce a flow of urine; and if the attack has been taken in time, the formation of a calculus in the kidney will be thus certainly prevented, or, if formed, will be very small, and scarcely ever fail to be brought away without the distressing feelings usually attendant on the descent of a calculus through the ureter.

130. As an auxiliary remedy in the treatment of this complaint, Dr. HENRY, of Manchester, proposes a medicine, composed of turpentine and opium, as capable of producing a plentiful discharge of lithic acid; and Dr. MARCET observes, that, from the known stimulating power of oil of turpentine on the urinary organs, it is not improbable that it would produce analogous effects in the other species of calculous disorders. To determine, however, the value of the remedy, it appears first necessary to enquire, whether the increased discharge of lithic matter is an indication of the morbid action being soon exhausted, or whether it is merely the consequence of additional excitement to wrong action in a part, the functions of which are already disturbed. Were the first of these views correct, the remedy might indeed be valuable; but should the second be the fact, this medicine would only operate by enabling the kid-

* Medical Dictionary, 4th edition.

neys to secrete a larger quantity of lithic acid, in a given space of time, than they did before.

131. In addition to the above means, I have also, at the onset of the attack, directly after the local blood-letting, laid a blister with much advantage upon the loins, ordering it to be kept open; a measure which I have more than once found arrest immediately the progress of the complaint, and very soon cure it, after the failure of other treatment. (Cases 17. and 19.)

132. The functions of the skin have so much influence upon the lithic diathesis, that while the body is exposed to profuse sweating, the quantity of lithic acid in the urine is considerably diminished; and the urine first discharged in the morning, however highly it be concocted, contains less acid than that secreted during the day. Hence the propriety of warm clothing in these complaints.

133. In the phosphatic diathesis, Dr. PROUT considers that the sediments, if amorphous, are invariably mixtures of phosphate of lime, and the triple phosphate of magnesia and ammonia. Great irritability of system, derangement in the chylopoietic viscera, flatulence, costiveness, or diarrhoea, with black, clay-coloured, or yeasty stools, in connection with uneasiness or pain in the back, generally attend these complaints. The urine is invariably pale, frequently in greater quantity than natural, and, occasionally, of as low specific gravity as 1.002, or even 1.001; sometimes the urine, diminished in quantity, is of higher specific gravity. In the former case, it is pellucid, colourless, and without sediment; in the latter, it may be opaque when passed, and, after standing, may deposit a most copious precipitate of the mixed phosphates. The urine extremely prone to decomposition, becomes alkaline by the evolution of ammonia, emitting a most disgusting smell.

134. In their progress, these complaints, Dr. PROUT observes, generally connect themselves with

constitutional indications of the most extreme debility ; and, in this state, seem capable of ending fatally.

135. With regard to the causes of these diseases, most writers agree, that they very generally originate in some strain, or other injury, of the back. Dr. PROUT says, he has frequently observed jaded and worn-out horses pass great quantities of lime in their urine ; and has remarked the same thing in dogs, particularly the sporting kinds. Dr. PEARSON also mentions instances in which large quantities of carbonate of lime were found in the urinary bladder of the horse* ; and Mr. BRANDE states an instance in which the bladder of a horse was found nearly full of sand, composed of phosphate and carbonate of lime ; and in the ox, the sheep, the rabbit, and the hog, were also found calculi, containing a large proportion of carbonate of lime ; the same substance being detected as one of the principal constituents in the turbid urine of the rhinoceros. †

136. In some instances, the formation of these deposits appears to be favoured, if not induced, by any continued mental fatigue or anxiety, or other cause of constitutional debility. Any protracted irritation, either in or near the urethra, or bladder, frequently operates as an exciting cause, especially any foreign body introduced into the bladder, and remaining there (Case 59.) ; and, upon the same principle, sediments of this kind very commonly appear in the advanced stages of strictures in the urethra, and in diseases of the prostate gland, or bladder. In Mr. HEAVISIDE'S Museum is a portion of a bougie, which, having slipped accidentally into the bladder, became incrustated with a deposit of the phosphates, exciting so much irritation as to require the performance of an operation for its extraction ; in the same collection is also the sec-

* Phil. Trans. 1798.

† Phil. Trans. 1808.

tion of a calculus from the female bladder, composed of the phosphates, and having a hazel nut for its nucleus.

137. The crystallized sediments are, according to Dr. PROUT, almost invariably composed of the triple phosphate of magnesia and ammonia, forming white shining crystals, and constituting a form of disease, milder in its characters and symptoms than that producing the amorphous sediments with which it may alternate. The pale urine in this case, frequently exhibits, on standing, an iridescent crystalline pellicle, small crystals also attaching themselves to the sides of the vessel.

138. Where these salts abound, the urine is of high specific gravity, contains much urea, and is prone to rapid decomposition. Sometimes, as in the excess of lithic acid, the crystalline deposit is formed before the urine is discharged from the bladder; most commonly it makes its appearance as the urine cools; but occasionally not till putrefaction takes place.

139. With regard to the causes, in addition to those already mentioned (135.), Dr. PROUT adverts to the opinion, that the continued use of alkaline medicines may produce a tendency to excess and deposition of the phosphates; but observes, that he has scarcely pushed those remedies so far himself as to witness such effects. Mr. BRANDE, however, is of opinion, that these consequences of the exhibition of the alkalies do occur*; and I think I have seen the phosphatic diathesis favored under the use of alkalies, to remove excess of lithic acid in the urine, although it was perhaps not easy to determine whether this change was the effect of the medicines, or the unrestrained course of the disease.

140. In the treatment of the phosphatic diathesis, the irritability of the system must, as far as

* Phil. Trans. 1808.

possible, be relieved, and the general, as well as local health restored, by tonic and other medicines.

141. In severe cases, Dr. PROUT observes, the only valuable means for relieving the extreme irritability, is opium, in large and frequent doses; the *pil. Saponis c. Opio*, five, ten, or fifteen grains, twice in the day, is very convenient and useful. Sometimes, according to circumstances, these medicines may be combined with mineral acids, bark, *uva ursi*, steel, or other tonics; or where the mineral acids disagree, the citric acid may be substituted. In one very distressing case of this kind, where other remedies disagreed or failed, I derived the greatest advantage from the exhibition of the carbonic acid (Case 88.); and Mr. BRANDE mentions a patient, who had a large calculus extracted from the bladder, composed entirely of the phosphates, and whose stomach did not admit of the use of stronger acids, to whom carbonic acid was given in water. It was found peculiarly grateful to the stomach, and upon examining the urine during its use, the phosphates were only voided in solution, but when at any time it was left off, they were passed in the form of white sand.*

142. The management of the bowels, the functions of which are always deranged, will frequently require caution; for although generally prone to confinement, Dr. PROUT says he has seen the most serious consequences arise from a small dose of calomel, which, by inducing diarrhoea, and consequent debility, so much aggravated the symptoms as to endanger the life of the patient. Many other authors, however, have observed, that the effect of brisk purgatives is sometimes particularly favorable, although their use requires discrimination; remarks that must have been verified by the experience of most practitioners.

143. As a general rule, Dr. PROUT considers,

* Phil. Trans. 1810.

that in these complaints, castor oil, as one of the least stimulating, is one of the best aperient remedies; although in the diseases of children, in which the triple phosphate is copiously deposited, repeated purgative doses of calomel and rhubarb are of the utmost advantage.

144. An unusual and curious instance is related by Dr. PROUT, in which a white earthy matter, and also small calculi, were discharged with the urine; both substances proving to consist almost entirely of carbonate of lime. To me, at least, the fact appears highly interesting, having met with several instances in which the cavities, functions, and structure of the kidney, have been choked up and destroyed by the progressive accumulation of a similar matter, without having before found any very distinct statement as to the occurrence either of gravel or calculi in the human subject, in which this substance has formed any very notable constituent. (62.)

145. A very interesting question connected with this subject, regards the manner in which one morbid secretion is, as it were, laid aside, while another is taken up; constituting what Dr. PROUT has very aptly named, the "transition state" from one diathesis to another.

Where, for instance, the lithic subsides into the phosphatic diathesis, the first change in the urine is an increase in quantity, a more pale colour, and a tendency to deposit pale amorphous sediments, mingled with the phosphates. As the change proceeds, the urine may perhaps be observed to form the iridescent pellicle (137.); if at rest, it soon putrefies, assuming a yellowish opaque colour, and frequently containing large spicular crystals of the triple phosphate. A calculus, extracted from the bladder during this change, was found covered externally with pale colored lithate of ammonia, nearly pure.

146. These appearances occur in sickly children,

and also in adults, particularly in irritable habits, and in those subject to lithic deposits. Every constitutional affection is of an irritable kind. As regards the tendency and importance of this stage of change, Dr. PROUT thinks it may be checked by the judicious use of the means for relieving it, provided the exciting causes are removed; for otherwise the phosphatic diathesis will eventually come forward, especially if there be already a stone in the bladder.

147. In the second stage of change the urine becomes of a still more pale colour, and is more decidedly alkaline. The lithate of ammonia diminishes or disappears, while the phosphates, particularly the triple phosphate, are increased, until at length the phosphatic diathesis is completely established. Dr. PROUT has laid down a valuable practical rule under this head, stating, that where the lithate of ammonia is deposited in large quantities with the phosphates, hyoscyamus rather than opium is to be preferred, as opium seems frequently to increase the formation of lithic acid. Another interesting conclusion to which the active spirit of enquiry in the present day has led, is, that a decided deposition of the mixed phosphates is not followed by other depositions.

148. Gravel or sand, composed of oxalate of lime, has been very rarely seen. Mr. BRANDE states, that in this diathesis little or no gravel is voided. A case is indeed mentioned, in which a man, aged 62, had some years before had slight symptoms of a renal calculus passing down into the bladder, and after two years' distress from symptoms of stone, a mulberry calculus, the size of a nutmeg, was removed by the operation. He had voided no sand, and his urine always appeared clear.*

149. With regard to the management of this diathesis, Dr. PROUT is led to conclude, as well from

* Journal of the Royal Institution, vol. xviii.

the dissection of calculi, showing that the oxalate of lime diathesis is both preceded and followed by the lithic acid diathesis, as from other circumstances, there is reason to believe both these diatheses are of the same general nature, and that, consequently, they will both require a mode of treatment founded upon one and the same general principle. (123.)

CASE 15.

Deposit of Uric Acid, with the Phosphates, from a Strain.

A HEALTHY man, 58 years of age, fell with a ladder from a waggon, *September 1. 1819*, severely straining the loins. He complained of great pain at the small of the back, and by the next day, though tormented with constant desire, was only able to void his urine by drops, with pain and straining.

September 3. Desire to pass water still more urgent; urine depositing a dense cloud of a red-coloured sand, a reddish-coloured substance of gelatinous appearance, and some few particles of whitish-coloured gravel, detected by the finger.

September 4. I was first requested to see him, and finding the general health undisturbed, desired he would remain quiet in bed, and take on that, and the following evening, an anodyne draught.

September 6. Infinitely better, and able to retain his urine with more comfort for two hours, than he could three days before for ten minutes. The water, now clear, exhibiting no trace of calculous or other deposit, passed in a free stream.

In the course of a fortnight more, under the above plan, he perfectly recovered.

CASE 16.

Deposition of Uric Gravel in the Urine.

A WOMAN, aged 40, consulted me, *July 19. 1819*, for severe pains in the loins and back, with occasional, and sometimes copious deposits of gravel in

her urine; to which complaints she had been subject some years. Finding, on examination, the sediment was principally a red sand, I directed ten drops of the *Liquor Potassæ* two or three times a day, for a week. This plan affording little relief, it was given up, and she was put upon a course of gentle purgatives for three weeks, at the end of which period her health was very essentially improved.

The deposit in the urine now scarcely perceptible, and that only rarely; the pains in the loins entirely gone. She was, however, advised to continue her medicines for some time longer, to ensure her remaining well.

CASE 17.

Deposition of Uric Acid, and the Phosphates, most effectually treated by Blistering.

A STOUT woman, aged 61, applied to me in *June* 1821, for a complaint in the loins. For many months, her urine becoming thick, she had been distressed by a sense of weight and occasional forcing pains about the bladder, most severe in passing water. More than once, after these pains, her water contained small fragments of coagulated blood, producing an appearance of little red streaks, when the urine was poured off. The frequency of passing water was generally three or four times in an hour. The attack commenced with severe pain at the loins, and a catching of the breath, shooting upward, as if from the middle of the back, near the spine.

These complaints had often obliged her to pass the night sitting up in bed. The violence of the attack had sometimes been materially relieved by ætherial medicines and opiates.

June 3. A severe pain came on in the back, a peculiar sense of warmth referred to the seat of the left kidney, especially increased by flurry, heat, or exertion, with a heavy bearing down pain in voiding

water, which deposited a copious white albuminous cloud at the bottom of the glass, in which I could discern particles of a red powder. The urine poured off, and the powder washed and dried, proved to be composed of fine crystals of uric acid. Some aperient medicines were directed, at short intervals.

June 30. The medicines regularly continued; the white and the red deposit in the urine had diminished, although slowly. On this day the urine was clear from albuminous matter, although the red sand still appeared at the bottom of the glass; and, on examining the dried matter precipitated from the urine a few days before, some few white shining crystals of the triple phosphate were discerned, and by a glass very distinctly seen, among the finer but more abundant particles of uric acid. As it was clear that the existing diathesis still favored the deposition of uric acid, I directed a drachm of carbonate of soda, two or three times a day.

July 10. The urine now deposited neither gravel nor albuminous matter; pain at the loins much relieved. The alkali was laid aside, and an aperient ordered, every night.

About the middle of *August*, the pain in the loins, and deposit of uric acid, and albuminous sediment in the urine returned, and soon became as bad as ever. I now directed her to try a blister, kept open for some time upon the loins, without medicine, hoping thus to derive some benefit.

August 25. The urine had again become clear, and although the blister had been troublesome, there had been less pain in the loins since its application than at any time within the last four months. She was therefore still advised to keep the blister open.

September 26. Yesterday afternoon not very well, from a dull pain about the small of the back; towards evening she was obliged to lift a very heavy weight, after which exertion, the pain in the loins was so much worse as to prevent her getting any sleep at night. The urine immediately became loaded with

fine albuminous flocculi, and though transparent, was of a bright crimson colour, from blood diffused through it. The recent strain to the loins, added to the previous increase of pain, I had expected would at least have brought on a fresh deposit of uric sand; but the total absence of this appearance, especially as the disturbance suffered by the kidneys was evidenced by the presence of albuminous matter and blood in the urine, drew my attention particularly; upon enquiry, I found the blister was still kept open. This fact I conceive to be important, in illustration of the power such a means possesses, in correcting derangement in the functions of the kidneys. I desired her still to keep up a discharge from the blister; to take at night a moderately powerful opiate; and to pay constant attention to the bowels.

October 10. The uneasiness about the loins almost entirely gone, and the urine permanently clear and healthy, she was now allowed to have the blister healed.

February 1823. This person remained free from any return of her complaints.

CASE 18.

Uric Gravel, and Renal Calculus.

A HARD-WORKING woman, aged 42, was suddenly attacked in the night of *August 4. 1822*, with pain in the left loins and about the hip. On rising in the morning, the pain was so severe, that on stooping, she could scarcely recover herself. The pain shooting down into the bladder, induced constant desire, and acute pain in making water, which was clear, and appeared healthy. The ensuing week she felt sickness at stomach, as she supposed, from the continued violence of the pain. In health, she was accustomed to pass generally two pints and a half of water in 24 hours; but the first week of this attack, not half that quantity, though the quantity

and quality of drink were as usual. During the second week, she was sure, that although the constant urgency to make water through the day was greater, she did not void half a pint in 24 hours. She was never disturbed during the night.

August 18. She first applied to me, observing, that for many years she had been subject to occasional attacks of red gravel, with frequent desire to pass water through the day, but never before with pain in the back. I ordered a blister to the loins, and an opening draught every night.

September 5. Pain much relieved; now able to stoop down and get up without any difficulty. Bowels kept open by the medicine, although naturally costive. The blister, contrary to my desire, had been healed; but she had applied leeches.

September 7. At the first of the attack, with constant desire, pain, and straining, she did not make half a pint of urine daily; now so much better as to pass with ease and comfort, with the same quantity of drink as before, at least two pints, free from sediment, in the same period. The breathing, and power to turn in bed, much more free. For the last two days she had felt a constant burning pain in the direction of the left ureter, much relieved by the operation of an aperient. She was ordered a dose of the compound powder of ipecacuanha, for an occasional anodyne; and castor oil, when confined.

October 15. The powder had produced sickness in the morning, but was taken generally at night, with the greatest benefit. To use her own words, it had "worked all the pain away," leaving her as light, active, and well as ever; and truly thankful.

There is every reason to believe, in this instance, from the urine being clear, from the peculiar pain in the ureter on the same side, as well as from the manner in which that pain was relieved, that a small calculus had passed down from the kidney, towards the close of the attack; although it escaped unobserved.

CASE 19.

Deposition of Uric Gravel removed by Blistering.

A YOUTH, aged 16, was placed under my care, in *November* 1821, for a frequency and uneasiness in making water; and as there was no distinct symptom of stone, nor any decided sediment in the urine, I directed medicines for some time without relieving, or indeed clearly understanding, the symptoms. The necessity for making water the moment the desire was felt, was so great, that frequently a few drops previously escaped, giving a very peculiar red stain to the linen; which, totally unlike blood, I could not exactly account for.

February 14. 1822. With the above symptoms, the urine, otherwise of healthy appearance, now exhibited a very sparing sediment, which, by a glass, I made out to be fine red crystalline particles of uric acid. He was directed a drachm of the subcarbonate of soda, to be taken daily in an aperient mixture.

February 19. Symptoms much relieved; daily quantity of the medicine diminished.

February 26. Urine free from any trace of cloud or sediment; and instead of every three or four hours, was only passed now every six or eight hours.

March 1. Laid aside the fifteen grains of soda, substituting a scruple of magnesia, in his aperient mixture.

March 6. The quickness and frequency of urine had now returned, bad as ever; and the water, free from mucus, again deposited crystals of uric sand; some attached to the sides of the vial, others loose at the bottom. He was directed a drachm of soda daily, as before.

March 16. Urine perfectly clear of uric sand; the frequency of passing it being diminished from eight to five times in the 24 hours. Medicine continued,

March 21. Although the medicine had been punctually continued, the frequency of passing water had again increased, while, in appearance, the urine was perfectly healthy. I now determined to lay aside medicine; and directed a small blister to be applied, and kept open, upon the loins; the bowels to be regulated by castor oil.

March 26. The blister very irritable and painful, but the complaints completely gone. The power of retention so improved, that he could now easily hold his water for two hours after he felt the desire to pass it.

April 4. From a severe cold, the urine for a few days deposited a fine pink-coloured albuminous powder, but not a particle of gravel. A gentle aperient was directed; and the blister, at his particular request, was permitted to be healed.

March 1823. This young gentleman remained perfectly well.

CASE 20.

Deposition of the Phosphates removed by the Exhibition of the Muriatic Acid.

A MAN, aged 50, taken into the St. George's Infirmary, *Dec. 9. 1815*, had been for twenty years subject to gravel. The most severe attack, in 1803, had confined him to bed near a month, with pain at the loins, and constant anxiety to pass urine; voided by drops, with extreme pain, turbid, and depositing more or less of a red gravel. From this period he was never confined, but his water often passed involuntarily.

He now suffered much pain in the kidneys, and uneasiness in the bladder. The urine, voided in small quantities, excited cutting pains at the neck of the bladder, great straining, and sometimes bleeding. There was also retraction of the right testicle, and a numbness down the thigh.

The urine loaded with mucus, deposited a calculous matter, containing some few crystals of red

gravel, but principally composed of white sand. Desired to take no fermented liquors; he was ordered ten drops of muriatic acid, in water, three times a day.

Under this plan he soon found relief. It was remarkable, however, that the symptoms, from irritation, declined some time before any sensible diminution in the quantity of sand in the urine. In a month he was so much better, that he requested to be discharged. The little remaining traces of calculous deposit were now only occasionally detected. He said he had not been so entirely free from pain and uneasiness, or at any time able to void his water so well for many years as at present.

Soon after quitting the Infirmary, these complaints entirely left him.

CHAP. III.

ON URINARY CALCULI.

SECT. I.

On Urinary Calculi in general.

150. **W**HERE the substances already noticed make their appearance in the urine, the patient is constantly liable to be assailed by evils of greater magnitude than those commonly arising from gravel. The matters of which these sediments in the urine are composed, frequently form hard masses, constituting calculi, variously lodged either in the cavities or canals of the urinary organs.

151. As to the discrimination of one species of calculus from another, while yet concealed within the living body, it seems to be impossible, unless an opinion is formed from the examination of the appearance and composition of gravel or sediment voided at the period of enquiry; and even this means is only capable of throwing light upon the present turn or diathesis of the constitution, without affording the least precise information whatever, with regard to the preceding stages of growth or composition of the calculus.

152. From what I have myself seen of calculous complaints, it appears that although the degree of distress, and the particular symptoms occasioned by these disorders, may be regulated in a great measure by the seat, form, and composition of a calculus, they are still more immediately dependent upon the prevailing turn of the patient's constitution.

153. The following remarks, consistent with the object of the present work, will be confined to the enumeration, and outward appearance, of those species of urinary calculi hitherto observed; the

modes of ascertaining and distinguishing the properties and dispositions of these substances, by the more accurate and delicate means of chemical analysis, forming a distinct field of enquiry, that falls more immediately within the department of scientific chemistry.

154. Dr. MARCET, who has exhibited the forms and colours of the various calculi, in his arrangement of urinary concretions, mentions, *first*, the lithic acid calculus. Colour usually a brown or red; surface smooth, or sometimes finely tuberculated. *Second*, the bone-earth, or phosphate of lime, calculus. Colour pale brown; surface smooth, as if polished. *Third*, the ammoniaco-magnesian phosphate calculus. Colour nearly white; surface commonly uneven, and covered with minute shining crystals. *Fourth*, the fusible calculus; a mixture of the triple phosphate, and phosphate of lime. Colour whiter than the former, consistence more soft and friable than any other species. *Fifth*, the oxalate of lime, or mulberry calculus. Colour very dark brown, or black; consistence usually hard; surface very rough and tuberculated. *Sixth*, the cystic oxyd calculus. Colour yellowish-white; surface commonly smooth, exhibiting a kind of crystalline appearance. *Seventh*, the alternating calculus, composed of two or more species, in alternate layers; external characters variable. *Eighth*, the compound calculus, of which the ingredients are intimately mixed; external characters variable. *Ninth*, the prostatal calculus. Colour yellowish-brown, or a fine pearly hue and polish; surface smooth. To these Dr. MARCET adds the two following, discovered by himself. *Tenth*, the xanthic oxyd calculus. Colour that of reddish-brown cinnamon; surface smooth, compact, and hard. *Eleventh*, the fibrinous calculus. Colour yellowish-brown; consistence that of bees-wax; surface uneven, but not rough. In addition to the above list, Dr. PROUT enumerates the two following con-

cluding species. *Twelfth*, the lithate of ammonia calculus. Colour generally that of clay ; surface smooth, or tuberculated. *Thirteenth*, the carbonate of lime calculus. Colour perfectly white ; texture very friable.

155. The power of acting upon and dissolving a calculus, in the living body, by means of medicines, is an object of such importance, that numberless experiments have been made for its accomplishment, and many distinguished characters in physic have devoted their time and talents to its attainment. Alkaline medicines have by these means been ascertained to be useful, and it was for a long time believed they actually possessed a solvent power. More extensive observation, however, has not favoured the permanent establishment of this opinion.

156. It is certainly true that alkaline medicines very frequently contribute to the comfort of those afflicted with stone, sometimes essentially relieving all the symptoms ; and the mode in which these remedies operate favourably, is by slowly diminishing the irritability of the bladder, by which the excitement is lessened, the tendency to contract violently upon the calculus is checked, and from the tone of the system being thus insensibly and gradually lowered, the whole train of distressing symptoms are rendered milder than before.

157. In some cases, where after a long course of alkaline remedies, the symptoms had declined, the patient had recovered his former health and activity, and the stone was therefore concluded to be certainly dissolved, and washed away with the turbid urine, the error has after death been discovered to have arisen from the bladder having formed a recess or pouch, into which the stone being received, has afterwards ceased to produce symptoms ; and the patient has been thus happily delivered from one of the most terrible and severe afflictions.

158. With regard to the introduction of fluids

into the bladder by injection, with a view to the dissolution of a calculus, according to the suggestion of FOURCROY, and subsequent recommendations of others, it is only necessary to observe that, from all that has been done upon the subject, it appears that the irritable cavity of the bladder is not likely, in any instance, to admit of the necessary perseverance, without injury to itself; and that the ill consequences to be feared from these experiments, very far outweigh the good that can be expected, or even hoped for, in any reasonable estimate, grounded, as all such estimates should be, upon experience.

SECT. II.

On Calculi in the Kidney.

159. CALCULUS or stone in the kidney, the occasional consequence of the causes already noticed, as productive of gravel (118.), most frequently induces a train of symptoms, attended with much distress to the patient. Sometimes, however, these bodies have been found, after death, where their existence was never suspected, from their having produced neither symptom nor sensation.

160. Calculous matter, in whatever form it may occur, is only met with towards the internal parts of the structure of the kidney; BOERHAAVE observes, "*Neque unquam in corticali substantia renum.*"* In the more internal part of the cortical substance, however, I have, in one instance, found minute concretions, apparently in the tubuli. (Case 4.)

161. The most usual seat of calculi in the kidney, is either the infundibula, or pelvis; they are also frequently found to occupy, and sometimes close up, the opening into the ureter.

162. Occasionally the habitual action of these

* Prælect. Acad. vol. iii.

glands, even under derangement in their functions, is very uniform; the kidneys continuing, for many years, to furnish a succession of small, smooth, rounded calculi, like small peas; which, escaping through the ureter and bladder, by the urethra, give rise to no very serious inconvenience. In other instances, a single calculus will form, and during a long period of confinement, and perhaps also from its acquiring a rough or angular surface, will excite all the worst consequences of continued irritation.

163. Sometimes calculi, originally formed in different parts of the kidney, may, by continued growth or increase, be brought at length into contact with each other; and, in particular instances, the further progress of concretion may effect the junction of the two parts, so that the whole shall eventually become one calculus. This I have observed to be the case, in making a section of a renal calculus, exhibiting two nuclei.* Neither has this remark escaped the penetration of M. DESAULT, who observes that, occasionally, they are “*agglutinés les uns aux autres.*” In this way it probably happens that, in particular cases, the whole of the cavities of an enlarged kidney have been found occupied by one very large and extensively-branched calculus.

164. Where a number of calculi occur in the same kidney, it commonly happens, that the surfaces of mutual contact are more smooth and polished, than any other parts. As a general rule, it has appeared to me, from what I have observed of these complaints, that calculi, composed of the phosphates, usually produce most distress; next to these, calculi of uric acid, where the surfaces are rough and angular; and next to these again, calculi composed of other ingredients, operating, perhaps, in the excitement of sympathies, or symptoms, very much according to their form, size, and particular situation or position.

* See PLATE I. *Fig. 1.*

165. It is curious to observe how small a calculus will, in some cases, excite a distinct and clear impression, as to its existence, in the patient's mind. In one instance (Case 30.), I found a small stone, not larger than a pea, in the pelvis of the kidney, without its appearing to have excited any material extent of irritation; where, notwithstanding the patient had, for almost two years before, said he was quite sure there was a calculus in that precise situation.

166. A very frequent consequence of irritation from calculi in the kidney, is the abrasion, or laceration, of the capillary vessels upon the mucous membrane lining its general cavity; not unfrequently, the ultimate consequence of the long continuance of this irritation is inflammation, supuration, and ulceration of the substance of the gland. By these means, the healthy organization of the kidney is occasionally destroyed, being found, after death, converted into a sort of pouch or large bag, filled with a mixture of purulent matter, urine, and calculi. (28.)

167. It is rarely possible to pronounce with certainty as to the existence of calculi in the kidneys, the indications being all derived from the deranged feelings and functions of the parts; and it now and then happens, that the kidney is found filled with calculi, in those who never had felt either pain or uneasiness that could lead to a suspicion of such complaint. These cases, however, are only to be regarded as exceptions to the ordinary course of disease, the functions of the parts concerned being commonly more or less disturbed by the presence of calculous concretions.

168. The most common symptom produced by renal calculus is a dull obtuse sense of weight, or pain, referred to the seat of the kidney, without perhaps the least visible derangement either in the secretion or excretion of the urine, or any material disturbance to the constitutional health. Occa-

sionally, however, the pain may become sharp, and so severe, as to equal that of acute inflammation, aggravated by every movement of the body, or even the attempt to turn in bed; producing various affections, from sympathy, in the lower limb, as in inflamed kidney; the patient complaining of cramps, violent tremors, sense of numbness, pain, and retraction in the testicle, to which M. DESAULT adds a progressive wasting, and occasionally a total absorption of the gland; an effect of this irritation that I have never seen.

169. Persons afflicted with these complaints are generally irritable and watchful, frequently feverish, and mostly subject to affections of stomach, nausea, and vomiting, with occasional tenderness in the abdomen. The secretion of urine variable; at one time free, at another nearly suppressed; now clear and limpid, then high-coloured, often tinged with blood, and sometimes consisting of little else than pure blood. The last mentioned appearance, which is very commonly the effect of exercise, as in stone in the bladder (Case 25.) may continue for a few hours, or for several days.

170. In perhaps the majority of instances, the tendency to secrete calculous matter is confined to one kidney; frequently, however, this disposition exists in both at the same time. Mr. SHERWOOD mentions a patient, long troubled with grievous pains in the back, who had voided great quantities of pus with all the urine she made, so that there was no doubt of there being ulcers in the kidneys. She herself often declared there were stones in the kidneys, which, on any motion of her body, she could feel grate on each other. On examination after death, the kidneys were both much enlarged, and within them calculi distinctly felt. In the right kidney several stones, branched like coral, extended into the infundibula from the pelvis, which was in each kidney so enlarged, as to contain half a pint of pus and more. These calculi appeared to

have formed cells in the parenchyma of the kidneys, which cells were all ulcerated within, and full of matter. The left kidney was full of matter, and contained one large stone. *

171. When, as sometimes is the case, calculous disease occurs in conjunction with some other malady, the complication rarely fails to aggravate the sufferings of the patient. A case of this kind is related by Mr. G. BELL, in a man for years afflicted with stone and gravel, who had also a rupture. In a severe fit of the stone, attended with the most violent tenesmus, and vehement desire to void his urine, a quantity of intestine was forced down, beyond his power to reduce. The rupture was large, but his urgent complaint was violent pain in the back, and along the ureters, with vomitings; exquisite pain at the neck of the bladder, and in the glans, with unusual weight in perineo. The urine, rendered with great torment, drop by drop, was highly foetid; sometimes purulent, at others of a coffee colour. In this misery he lingered several weeks; and on his death was opened. The left kidney was found wasted away to a thin ulcerated cyst, filled with blood and pus; the ureter much enlarged, and filled with a similar matter. The right kidney was ulcerated in several places, and full of purulent matter and gravel; the ureter enlarged. The bladder was found filled with clear urine, to the extent of three pints; within its cavity were two smooth stones, the size of windsor beans. A third calculus, the size of a filbert, which appeared to be the immediate cause of death, was discovered forced into the neck of the bladder, the passage of which it entirely closed. †

172. Another interesting and well defined case of calculi in the kidneys, complicated with other visceral disease, is mentioned by Dr. HUXHAM, in

* Phil. Trans. vol. xli.

† Phil. Trans. vol. xlii.

a woman of 60, long subject to pass gravel and small calculi, and for several years prior to her death, afflicted with nephritic colic, great pains in the stomach and back; sometimes her urine was bloody, at others she could pass none at all. At length dropsical, she complained many weeks before death of violent pain in the stomach, and a hard swelling under the ensiform cartilage; with almost perpetual vomitings, colic pains, extreme costiveness, and difficulty in voiding urine. For the last fortnight she vomited every thing, and had total suppression of urine; dying comatose and convulsed. On opening the abdomen, the viscera formed one confused mass. The omentum grown as it were cartilaginous, and almost tough as leather, formed several large scirrhus tumors, and some tubercles full of foetid pus. The stomach, bowels, and liver, diseased, and adherent together. In the cavity of the abdomen, were about six quarts of offensive serum. The urinary bladder, quite empty, and almost putrid, was moistened on the inside with a purulent matter. In the right kidney, a large stone occupied nearly the whole space of the pelvis; in the ureter, were two or three small stones, which with a very tough mucus, entirely closed up the passage, which obstruction was, indeed, nearly effected by the stone in the pelvis. In the left kidney was a smaller stone, within its pelvis, wedged into, and closing up the opening into the ureter. This last stone removed, though no other was found in the ureter, water could not be forced through it into the bladder, although a strong injecting syringe was used; for the cavity of the ureter greatly contracted, was at one part completely obliterated. *

173. When from long continued calculous irritation, the kidney falls into a state of suppuration and abscess, the feverish symptoms more steadily

* Phil. Trans. vol. xliii.

established, are observed to increase regularly towards evening, sometimes preceded by chills, succeeded by decided heat, and followed by a copious perspiration. The urine turbid, deposits a mucous, albuminous, or purulent matter, sometimes containing small coagula of blood, and occasionally appearances like shreds of the partly ulcerated substance of the kidney. (Case 3. and 4.)

174. Where abscess has formed within the substance of the kidney, whether from the presence of calculi, or otherwise, it is concealed at first by its deep situation, which prevents the possibility of the fact being ascertained, until from the development of circumstances already noticed (49.), the matter makes its way towards the surface of the body.

175. The determining upon the existence of calculi in the kidney, is generally a point of difficulty. Each of the symptoms usually produced by stones in the kidney, and in occasional instances all the symptoms together, have been induced by affections or diseases of other viscera, the pancreas, mesentery, spleen, or uterus. Where, however, the patient has in time past been known to pass gravel, or calculi, or where the complaint may be traced in the family, most of the other indications being present, there will be a pretty good ground for determining upon the nature of the disease. Upon the uncertainty of symptoms, LIEUTAUD remarks, that REGA opened the body of a man who had long complained of continual pain in his knee; and only found a large calculus in the kidney, where he had never experienced the least uneasiness. *

176. In general, calculi in the kidneys become sooner or later the sources of extreme danger, and not unfrequently prove the cause of death. Much, however, of the serious tendency of the symptoms, will depend on circumstances that can neither be

* Précis de la Méd. tom. ii.

calculated upon, or foreseen. Such are the varying states and turns of constitution, the size, form, situation, and composition, of the calculus, its rate of growth or increase, and some other points of equally difficult determination.

177. The direct aid of surgery can rarely administer to the relief of these complaints, unless in seconding the efforts of nature, upon the appearance of tumor in the lumbar region. The opening of the abscess may in this case allow the escape of the calculus, or permit its extraction; otherwise the efforts of art are merely palliative. Nature, however, has the power of stepping far beyond art, with a quietude peculiar to herself; as is proved by the account Mr. SIMMONS has given of a woman, who, after being ten years subject to gravel, had swelling in the left loins, which, after much pain, suppurated; the fistulous wound remaining open. Fifteen years after this a fit of increased distress and pain in the loins, came on. The discharge from the wound suddenly diminished, and in eight days a small pea-like calculus was extracted from the wound; after which no gravel was voided with the urine, though no urine ever passed by the wound. Six other paroxysms similar to the first took place, ending in a similar manner, so that seven calculi passed through the wound. In the intervals the health was very good; and the orifice of the wound, soon after the exclusion of a calculus, returned to its usual size, scarcely admitting a common probe.* A case somewhat similar is recorded by TULPIUS; but in this instance, the exclusion of the calculus occasioned a callous ulcer, through which pus and urine perpetually flowed.† Mr. CHESELDEN observes, that he had from three patients extracted calculi, which had made their way from the kidney to the integuments, occasioning abscess.

* Phil. Trans. vol. lxiv.

† Observationes Medicæ.

178. Where the distressing symptoms produced by calculus in the kidney, are extremely urgent, even where circumstances may render it almost absolutely certain that they arise from stone, it is scarcely possible to look to surgery for relief. The difficulty of cutting into the pelvis of the kidney from the loins, even in the dead body, is rather considerable, without opening some large blood-vessels, and the great and immediate danger from such an occurrence in operating upon the living body, is too obvious to require comment. A case, however, has occurred, and is recorded, in which even this operation was performed with success. A gentleman, reduced almost to distraction, by extreme torment from a fit of stone in the kidney, prevailed with an expert surgeon to perform the operation of nephrotomy. Hæmorrhage interrupted the operation, which however was completed the next day; the body of the kidney was cut into, and two or three small stones were extracted. The patient was instantly relieved from the severity of his pain, and there was no recurrence of bleeding. The wound became fistulous, from the constant passage of the urine. His health restored, the wound allowed a considerable time after the operation the escape of another calculus from the kidney, of the form and size of a date stone. Ten years afterwards, Dr. TYSON examined the wound, at which period the matter discharged had always a strong urinous smell; and his health and vigour at this time, 50 years of age, was remarkably good. *

179. As there is no mode of treatment known, by which calculi once formed in the kidney, can be dissolved, the attention of the practitioner must be principally directed to the alleviation of the symptoms, the preventing if possible the growth or increase of the disease, the opening of any abscess

* Phil. Trans. vol. xix.

should this be required, and where it is practicable the extraction of calculi.

180. Where irritation, spasm, or inflammation of the kidney are induced, the usual means may be employed. Inflammatory action in particular, will require the most prompt attention (20.); after which, anodynes, opiates, ætherial and other anti-spasmodic medicine, may in most cases be directed with great advantage.

181. Inflammatory action, if neglected, or allowed to proceed, will frequently run on to suppuration of the kidney; to prevent which, the strictest attention should be paid to quietude and abstinence. The regimen should be of the most cooling, and least stimulating kind. Even these means, however, will not always succeed, the majority of such cases declining eventually into a state of low hectic fever, under which the patient sinks.

182. Should abscess make its appearance upon some part of the loins or hips, fluid being perceptible, the mischief to be apprehended from the purulent contents escaping into, or injuring the surrounding parts, is such as to render an early opening in general advisable. It may also afford, perhaps, a chance of still preventing the entire destruction of the kidney..

183. As to the best mode of opening these abscesses, M. DESAULT observes, that as a free opening admits of a more satisfactory examination, and may also afford the means for removing calculi, the bistoury is upon the whole to be preferred. There are, however, as it appears to me, good reasons why the use of cutting instruments should be avoided in these operations, where the necessity for their use is not indispensable (57.); I therefore prefer Mr. HEAVISIDE's mode of operating, in which the external parietes being first carefully divided to some depth, a common trocar is passed into the cyst, and the contents evacuated. (51.) It will be afterward very easy to

examine, if necessary, the internal cavity, with a probe of sufficient length, to detect the presence, and the seat of calculus; and any required enlargement of wound may be subsequently determined on, when the necessity for it is clearly established.

184. When an abscess connected with the kidney is opened, should a calculus be detected, fixed in a deep situation, probably within the cavity of the kidney, all the good that would result from the enlargement of the external opening, might be the additional risk incurred by the operation, without affording to the patient any additional chance of getting rid of the cause of all his misery.

185. Where abscess in the kidney passes its matter to a considerable distance between or among the abdominal muscles, previous to its opening externally, it will, as a general rule, be expedient to follow and lay open the sinus, with a curved bistoury, until the more direct opening be found into the purulent cyst; we shall thus at least, facilitate the healing of a part of the ulcerated space, affording at the same time, a more ready means for examining the original abscess, where, if any calculus be found loose, it may be extracted.

CASE 21.

Renal Calculus, voided by the Urethra.

IN the following case, which fell under my notice at Scarborough, in 1808; a middle-aged man was suddenly attacked with violent pain, in and about the right side of the loins. After two days' continuance, the pain subsided, enabling him to return to his work, as a shoemaker; but for the next five months, he remained subject to the same complaint, which sometimes came upon him with such violence, as to excite fever. The most severe was always an acute pain, shooting down along

the ureter, and occasionally extending to the external orifice of the urethra.

Latterly he felt a degree of torpor, both in feeling and power of action, pervading the right side of the body and limbs; and occasionally a most distressing tenesmus, and urgency to void urine, although neither stools nor urine passed without extreme pain.

During the intervals, he rarely felt as in health, always conscious of some existing obstruction to the free passage of his water.

In one of these attacks, extremely ill, he took two grains of opium; it lulled the pain, and he got sleep. In the evening he took a second pill, slept well, and next morning arose free from pain or uneasiness. He thought himself quite recovered. Towards evening, in making water, he felt something make its way suddenly into the passage, obstructing the flow of urine. It gave great pain, exciting the most urgent straining; which continued till at length the cause of the obstruction was shot out from the orifice of the urethra, and the water then flowed free as ever; and on examining the chamber-vase, a small uric acid calculus, the size of a pea, was found to have been the cause of all his distress.

CASE 22.

Uric Calculi, from the Kidneys.

Sept. 30. 1821. I was requested to see a woman, aged 59, who for the last five or six years had been subject to attacks of violent pain, with sickness, vomiting, and cold sweat. At first she thought her complaint Lumbago, and was blistered, bled, and physicked, to no purpose. She soon, however, voided with her urine, a small brown stone, the size of a pea, which determined the nature of her complaint.

In 1818, she had a severe attack, continuing

ten days and nights; the violence of pain being confined to the right side. Towards the close of this attack, she passed another small calculus.

For the last twelvemonth, her water had been often tinged with blood, during the frequent and severe attacks of pain. She had voided several small round calculi during this period.

Sept. 1821. Her urine contained blood, more obvious after exercise, but evident when at rest; sometimes obliged to pass her water every ten minutes. The blood generally produced the appearance of an obscure chocolate colour; at times, the water was a brilliant clear crimson, when the blood was recently effused, but generally the colouring matter was dark, subsiding to the bottom. Acute pains about the loins, and down the right ureter, were sometimes very severe.

Sept. 30. I directed a draught, with forty drops of tincture of opium, to be taken occasionally; requesting that the bowels might, if necessary, be regulated by castor oil.

October 3. Much relieved from pain; the urine was now restored to its healthy appearance. After much walking the preceding day, a spasmodic increase of pain came on, with prickling and shooting in the ureter, so intense, that sometimes she could scarcely endure it.

October 9. Very much better, but not free from pain. She felt the pain coming round the side, and getting lower down, but with less apparent difficulty than usual. Urine perfectly clear.

November 13. For, the last three weeks, quite free from pain, and better than at any time for the last two years. After the late attack, no calculus had been found to pass; but it might, if small, have escaped unperceived.

May 6. 1822. This patient called, and brought me a small oval, minutely tuberculated, brown calculus, the size of a large pea, passed a month before, after a fortnight's severe distress, constant

urgent desire and straining to pass her water; most violent pains down the left side, sickness, vomiting, and cold perspirations. For the last week of this attack, besides frequently taking the opiate, she had used the warm-bath every evening, but the pains were, notwithstanding, very severe, commencing in the loins, shooting along the ureter, and catching the breath. Since taking the opiate, there had been no return of bleeding. She observed that she could not at present venture to draw in a full breath, the pain catching her in the loins, and shooting up into the chest, although she found her health much improved since taking the medicine.

November 1822. With a severe return of her symptoms, another uric calculus, similar to the former, passed from the kidney, and was presently voided by the urethra.

SECT. III.

On Calculi in the Ureters.

186. SMALL calculi frequently find their way into the ureters, and driven forward by the urine, pass downwards, and thus reach the bladder, sometimes with little distress to the patient. Much, however, frequently depends on previous circumstances. In some cases, preceding obstruction to the flow of urine may have left the affected ureter in a state of permanent enlargement, in which state I have known a calculus, the size of a hazel nut, pass down from the kidney into the bladder, without exciting any material uneasiness.

187. Occasionally, the ureter has been found not only much dilated, but from inflammation, and its consequences, partially lined internally with adherent gravel; now and then it also forms a sac or pouch in some part of its course, containing one or more small calculi, or a quantity of gravel, nearly or entirely closing its canal.

188. The dilatation of the ureters, and the retention of urine within them, from the passage of calculi, most frequently lead on to irritation, spasm, more or less inflammatory action, sometimes ulceration, and consequent rupture of the canal, and eventually a collection of urine in some part of the lumbar region, which is generally fatal.

189. The passage of a calculus through the ureter commonly excites irritation and pain in the course of that tube, with uneasiness or pain at the loins, numbness in the thigh, retraction of testicle, or pain in the groin, with distressing nausea and vomiting. A large calculus has, however, been found on its way through the ureter, where it had not excited a single symptom; and on the other hand, the whole train of symptoms, commonly attendant in these cases, has been sometimes found to occur, from complaints of a totally different kind.

190. The positive existence, therefore, of a calculus in the ureter, can very rarely be decided upon with certainty. Where, however, the present symptoms have been preceded by distress and pain in the kidney, the patient having, on former occasions, passed small calculi with his urine; where the pain moves progressively lower down, consistent with the usual movements of a calculus in reaching the bladder, the pain being influenced by exercise or rest, much like calculus in the kidney, sometimes acute and shooting, at others, dull and heavy, occasionally shooting on towards the pubes and hips, and into the urethra, and not unfrequently creating feverish heat and spasms; there will be every reason for giving a clear and confident opinion.

191. It is observed, by M. DESAULT, that those who propose as an indication of calculus passing the ureter, the retention of urine in the cavities of the kidney, go about to prove the existence of a disease by the presence of a symptom that is still more obscure than the disease itself. For, pro-

vided the cause of retention does not exist in both ureters, the quantity of urine voided may not be diminished, the secretion from the one kidney increasing in proportion as the functions of the other are impeded; and should both ureters be obstructed at the same time, there is no mode of actually distinguishing the case, from one of suspended secretion, or suppression.

192. Neither is retention of urine in the ureter by any means the uniform consequence of stone or gravel in the canal; for if a calculus be angular, the urine will sometimes flow freely enough by its flat surfaces, and if the passage is obstructed by a collection of gravel, the secreted fluid will, in occasional instances, filter through it, and thus find its way, with little difficulty, into the bladder: indeed, M. DESAULT says, "On a même trouvé dans plusieurs cadavres les uretères pleins de graviers, à travers lesquels se filtroit ce fluide, sans que son excretion en fût aucunement empêchée;" and M. LE DRAN mentions the dissection of a woman who had been executed, in whom he found the middle of the ureter so distended as to contain a collection of three ounces of gravel, through which the urine passed, and filtrated as through a bed of sand.

193. Provided a calculus is sufficiently low, its presence may sometimes be detected by the finger, in examining by the rectum, or vagina; when even should the stone not be very distinctly felt by the point of the finger, the pressure forward, if there be a calculus, will almost invariably clear up any doubt, by instantly exciting the local pains and sympathies attendant upon calculus thus circumstanced.

194. Should the calculus have reached the lower orifice of the ureter, so as to project into the cavity of the bladder, it may be struck by the instrument used in sounding the bladder; but even then, whether it be a calculus in the ureter, or an encysted stone, partially concealed within its pouch,

can only be determined in opening the bladder by the operation for lithotomy, when the point of the finger may ascertain its exact situation. Upon this point, LE DRAN observes, he cut a patient who had a stone fixed in the ureter like a diamond in its socket, not entering the bladder above one-third of an inch, which prevented him, on the day of the operation, taking hold of it with the forceps. Finding, seven weeks after, it had made its way into the bladder about half an inch, he got hold of it, and brought it out. It was two inches long, and might have continued as fixed in its socket as before, had there not been a suppuration in that part.

195. The treatment that answers best for the relief of symptoms produced by calculus in the ureter, will be essentially the same with that laid down for the management of similar affections of kidney (180.); in the present case, however, the greatest reliance, after due attention to inflammatory symptoms (20.), is to be placed on the free and frequent administration of opiates, which, if directed with judgment, will sometimes operate as a charm.

196. The use of horse exercise, jumping or leaping, or the excitement of coughing or sneezing, with a view to assist in driving the calculus forward, although recommended by many writers of celebrity, is to be adopted with caution, as additional distress and mischief has sometimes been the only result. The same uncertainty, however, does not attach to the use of opiates, mucilaginous and emollient drinks, and the warm-bath, with constant attention to preserve an easy, regular, and free action of the bowels; all which means tend most powerfully and safely to facilitate the transit of calculus.

197. Where a calculus is detained within the lower orifice of the ureter, it has been proposed by LE DRAN to inject warm emollient liquids into the bladder, with a view to relax the opening, and favour

the escape of the stone ; any means tending to abate irritation and spasm, is doubtless likely to do good ; but it is experiment alone that can in any such case determine how much, or whether any benefit is likely to be derived from applications made in this way ; I should myself rather depend upon warm starchinjections with laudanum, occasionally thrown into the rectum.

198. In one instance M. DESAULT, in performing the operation for lithotomy, found the calculus confined within the orifice of the ureter, and by an instrument previously adapted to this particular emergency, he was enabled to finish the operation, and extract the stone.

SECT. IV.

On Calculus in the Bladder.

199. THE nuclei of urinary calculi are in general, but by no means invariably, derived from the kidneys. In occasional instances the careful division and examination of calculi proves that any foreign body, a small coagulum of blood, or any tenacious albuminous matter accidentally lodged in the bladder, may be sufficient for inducing at first a loose agglutination of calculous particles, and subsequently a more compact and firmly consolidated mass.

200. Any foreign substance also, finding its way by the urethra or by a wound or ulcer, into the cavity of the bladder, commonly becomes covered with calculous matter, for even where the diathesis does not previously exist, the irritation from the extraneous body appears to bring it forward, and in this way we see that instruments lodged in the bladder for a time are liable to become incrustated with rough particles of calculous deposit. (Case 59.) Upon the same principle, a grain of wheat, a pin or needle, very commonly a leaden bullet, in one instance a hazel nut (136.), and in another mentioned by DESAULT, from the female bladder, "*une pomme*

d'api," a small hard apple, the size of a cherry; have been found to form the nucleus.

201. Where, however, a foreign body forms the nucleus, a calculus is not subject to such variety in composition, as in other cases; being almost exclusively made up of the phosphates. In Mr. HEAVISIDE'S Museum, a very large calculus, which appears to be principally composed of the phosphates, perhaps with some carbonate of lime, has been formed upon a small central mass of mucous, or albuminous matter. *

202. A stone felt distinctly in examining by the sound, may not be loose in the bladder; or if so at one time, may not be so at another. The state of habitual irritation to which the bladder is commonly reduced by continued distress from stone, frequently induces additional and forcible efforts in contracting upon its contents; and under these circumstances, if it happens that the muscular strength of the coats of the bladder be unequally distributed, or not perfectly balanced one part against another, the weaker portion yields, and a pouch or sac is eventually the consequence, into which the stone may fall; and thus in some instances a calculus, within the reach of an instrument in sounding, may not without great difficulty be capable of removal, in the operation for lithotomy.

203. In certain instances again, where alkaline remedies have been taken, a stone, the previous existence of which was proved by sounding has disappeared; and the operator no longer able to find the calculus by an instrument, the patient at the same time experiencing the most perfect relief from his symptoms, and especially from voiding his calculous matter with the urine, it has naturally, but erroneously, been concluded that the stone has dissolved, and passed off by the urethra. M. LIEUTAUD, convinced of the lithontriptic powers of alkaline

substances, mentions a man, aged 50, who had made up his mind to be cut. The stone, struck by the sound, always produced the most acute pains, which were re-excited upon every attempt to expel a few drops of urine. Appetite, rest, strength, and flesh, all gone, he was persuaded to try Mrs. STEPHEN'S medicine; and after seven months' use of it, during which period he voided many calculous fragments, he recovered his health, together with the power of retaining, and most perfect ease in voiding, his urine. The sound, now passed by the lithotomist who was to have performed the operation, could find no trace of a stone, in any position; and many eminent surgeons present, repeating the examination in every possible way, were all satisfied there was nothing in the bladder, and that consequently the cure was complete.* In another case, where this medicine had been taken, the patient having lost the symptoms of stone, and his surgeon the power of finding it by the sound, Mr. NOURSE examined the bladder after death, and found no fewer than six cysts, containing nine calculi.†

204. Several fine specimens of this state of bladder are preserved in Mr. HEAVISIDE'S Museum; one particularly, containing several encysted stones, illustrative of the effect of supposed solvents, as in the above cases. In the Museum of the Royal College of Surgeons, there is the bladder of a man, with two sacs at its posterior part, each containing a large calculus, irregular and crystallized on its surface; the coats of the bladder, particularly those of the largest of the sacs, contrary to their general state, have become excessively thickened.

205. By careful attention to the progress of disease, we find, that in severe irritation of bladder from gravel, particularly where combined with stricture, excitement will proceed so far as to end in effusion of coagulable lymph upon the inner sur-

* Précis de la Méd. tom. ii.

† Phil. Trans. vol. xlii.

face of the bladder, and not unfrequently under these circumstances we find calculous matter adherent in patches to those parts where effusion had previously taken place. Very much the same thing may occur with stone, where long-continued irritation induces effusion of coagulable lymph, the surface of which, attaching itself to the uneven texture of the calculus, becomes a bond of union between it and the mucous membrane of the bladder.

206. In one case of this kind LE DRAN extracted from a lady, a stone of seven ounces and a half, the lower flattened surface of which was adherent by fleshy or fungous excrescences, arising from the bladder, and fixing themselves into the rough face of the calculus. The adhesion was separated with hardly any pain. Ten days after, the diseased part of the bladder sloughed away, casting off several thick pieces of membranous substance. Three other instances of adherent calculi are also mentioned by this excellent surgeon, each attached by a surface of less extent in proportion to their size; but as they all recovered, he could only learn the state of the bladder in one, who died some months after of bleeding from the nose, and nothing was then to be seen but a cicatrix.* Dr. PRESTON witnessed an operation, in which a calculus, adherent, could not be removed, and was therefore left behind; suppuration coming on, the medium of adhesion was destroyed, and on the eighth day after the operation, the calculus was extracted with ease; and the day after the separation, "the fibres by which it was tied were still attached."†

207. The most interesting case, however, as proving the degree of violence the urinary bladder may sometimes endure, consistent with recovery, occurred to M. LE CAT, who opening the bladder by the high operation, in a case in which it was found

* LE DRAN'S Operations, translated by GATAKER.

† Phil. Trans. vol. xix.

contracted round a large stone, it proved to be so closely and at the same time so extensively connected, as to require great exertion and perseverance, as well as force, to separate the adhesions, and extract the stone; almost the whole rough surface of which was fringed with the fibres of the adherent substance, torn asunder. By strict attention to depletion and the warm bath, the patient perfectly recovered.* In a case somewhat similar, that occurred to Sir E. HOME, partial adhesion appeared to have taken place from irritation produced by injecting, for gonorrhœa.†

208. It does not appear that the particular composition of a calculus has any influence in favouring its becoming adherent; for in the case just mentioned the surface of the calculus was composed of the phosphates, but in another instance in which Mr. HEAVISIDE operated (Case 23.), a similar medium of adhesion had attached itself pretty firmly to a calculus of oxalate of lime. Neither is this disposition in coagulable lymph to unite itself to a stone, confined to calculous substances in the urinary passages, for I have once found and removed a gall bladder filled with small calculi, to which upon further dissection I found the inner membrane at every point closely adherent; a circumstance that induced me to put up the preparation, in Mr. HEAVISIDE'S Museum. An instance of a similar kind is also mentioned by Dr. BATT, where a gall stone was found adhering to the inside of the gall bladder‡; and I fancy other extraneous bodies are liable to the same thing, although I am only aware of one such instance (Case 59.), in which on gently drawing a short elastic gum canula out from the cavity of the bladder, I found it attached by its

* Phil. Trans. vol. xlv.

† Practical Observations on Strictures.

‡ Memorie della Società Medica di Emulazione di Genova, tom. i.

point to the internal surface, each essay to draw it forth exciting to the patient's feelings a curious and peculiar sensation of heat, but no acute pain in the part. When extracted and immersed in warm water, fibrous portions of coagulable lymph still attached, were very evident, and the separated parts were manifest. The adhesion of these fragments to the surface of the instrument was so strong, that in attempting to pull them off they tore asunder, still leaving some part behind.

209. The adherent state of a calculus may in some instances be tolerably well ascertained, in the operation of sounding, provided the stone be small, and the bladder capable of being somewhat distended with urine; for the sensation conveyed by the instrument may be perceptibly that from a hard body confined in a particular part of the bladder. This point, however, can in no case be positively determined; neither does its importance require that it should, for it does not appear that in any instance it should prevent the extraction of the calculus, nor that it would materially diminish the probability of a favourable event, by the operation.

210. The existence of calculus, either in the kidney or ureter, if known, leads very rarely to any possible assistance from the active hand of surgery; when, however, stone is present in the bladder, the surgeon has in general the power of determining positively upon its existence, and consequently of delivering a more clear opinion as to the course that under all the circumstances of the case should be adopted, for the relief or removal of the disease.

211. One of the most common symptoms of stone in the bladder, is pain in the seat of this viscus, and parts around. This symptom, however, is uncertain, for I some years since was requested by Dr. HOOPER to examine the body of a man, in whose bladder were found at least a dozen calculi, several of which were as large as a chesnut, where

upon enquiry it was evident there never had been symptoms; but these occurrences are rare, for pain is generally present, though not at all times to the same degree of intensity. The pain is commonly more or less acute, dependent on the varying irritability of the invalid; and the form or position of the stone; generally calmed by repose, renewed upon the slightest motion, and most aggravated by horse exercise, or a rough carriage; accompanied with a sensation of weight in the perineum, stupor in the thigh, and retraction of the testicle.

212. From extreme suffering, some patients are in a state of constant agitation, some will even pass a finger into the rectum, under the idea that they feel a hard body which causes bearing down, inducing at length prolapsus of the rectum, or hæmorrhoidal tumors.

213. In severe paroxysms, involuntary erections, with vehement irritation in the glans, are the most insupportable evils, often connected with a discharge from the urethra. Constant desire, and frequent want of power to void urine, the attempt exciting fruitless and fatiguing efforts to pass a stool. When the stone is large and rough, the pain is most acute after efforts to pass urine, from the internal surface of the bladder being pressed against the calculus, which still excites renewed contraction; and should the stone be small and polished, it will sometimes find its way into the neck of the bladder, so as suddenly to arrest the flow of urine, and cause great pain. The last mentioned symptoms I have also known produced, by a curious and uncommon affection of the inner membrane, forming a transverse fold or valve across the neck of the bladder, opposite the orifice of the urethra. This complaint, as it increased, brought on occasional, frequent, and eventually permanent obstruction, only relieved by the introduction of an instrument; and the young patient died eventually of retention of urine.*

* This disease, preserved in Mr. HEAVISIDE'S Museum, is represented PLATE II. *Fig. 3.*

214. Incontinence of urine is also an occasional effect of stone in the bladder; a circumstance that may depend on the uneven surface of a calculus fixed in the neck of the bladder, without perfectly filling the space. This position of a stone, which favours the flow of the urine over one part only of its surface, sometimes leads to the appearance of a groove or channel along one side of the calculus, by the influence of the stream.

215. The urine excreted, is in some cases loaded with albuminous matter, a light cloud, or heavy sediment, and sometimes a purulent matter, frequently mixed with blood.

216. The symptom of all those mentioned, least liable to deceive, is perhaps the irritation about the orifice of the urethra; but even this will occur only when the stone is pressing against the neck of the bladder; and in cases where there is no stone at all, the same sensation is excited by ulceration or other irritation at the neck of the bladder. (Case 59.)

217. The symptoms induced by calculus, depend much on the situation of the stone, which laying against the neck of the bladder, produces its clearest indications. Where it occupies a middle situation, the inconveniences resulting from it are generally less distressing, and in those few cases where it has been known to remain in the fundus of a relaxed bladder, Sir E. HOME observes it has produced extreme irritation in the rectum, and there only.

218. Affections of prostate gland are occasionally productive of symptoms, extremely apt to be mistaken for those of stone in the bladder. These, however, are less subject to aggravation under exercise than those from stone; and where the prostate is enlarged, it can be detected in examining by the rectum. The distressing symptoms from stone increase in paroxysms, compared with which the symptoms from diseased prostate are less subject to variation, and usually much less severe.

219. Symptoms alone, however clear or conclu-

sive they may seem, do not warrant a positive opinion as to there being a stone in the bladder. A better foundation is required, and we must not rest satisfied with symptoms, where we may obtain the evidence of our senses. The operation of sounding may enable the surgeon not only to feel the stone himself, but frequently to render it audible to by-standers. On this operation alone can we rely for obtaining a satisfactory proof of the existence of stone in the bladder, and without having ascertained the certainty of the fact by having felt the stone with an instrument, we can never recommend, much less perform, the operation for lithotomy.

220. The position of the patient in sounding must vary; where the calculus cannot be felt in one posture, another must be tried. The full bladder has some advantages; although the space then large, should the calculus be small, will sometimes increase the difficulty. It is, however, not easy to lay down rules for the management of this operation, for the most expert surgeon will sometimes fail in finding a stone, which shall be felt at once by another of much less experience.

221. A fasciculated state of bladder, the calculus being coated with a stiff tenacious matter, its being lodged within a pouch, or the point of the instrument getting into the opening of an enlarged ureter, are all circumstances mentioned by M. DESAULT as capable of embarrassing the operation of sounding. A fungous state of bladder, a tumor situated behind the pubes, a polypus, a pessary, or other extraneous body in the vagina, scirrhus of the uterus, or rectum, or hardened fæces in the bowels, are also stated to be capable of forming tumors that in sounding may be mistaken for stone; it appears to me, however, quite unnecessary to go in detail into these points, as common attention will in general enable the practitioner to judge accurately as to the seat and cause of the complaints.

222. With regard to the selection of the instrument, the majority of practitioners prefer a metallic catheter, which has this advantage, that when the full bladder has been examined, the water may be allowed to run off, and the sides of the cavity, now brought into more immediate contact, may bring the calculus within the reach of detection; M. DESAULT prefers a metallic instrument, but others are occasionally induced to prefer one of elastic gum, one advantage of which, Sir E. HOME observes, is, that a person who has long suffered in perpetual pain and irritation, perhaps having had repeated attempts made to find the stone by sounding, is so struck by the idea of the torment he must endure by a repetition of the experiment, that he sometimes cannot possibly bring his mind to the proposed trial; whereas if his feelings are not alarmed, if he is merely requested to allow the urethra to be quietly examined by a hollow bougie passed into the bladder, he suffers little in apprehension, and not much more in reality.

223. The inconveniences produced by a stone in the bladder, may be trifling; but most frequently the sufferer is fatigued day and night by acute pain, occasional attacks of inflammation of bladder, and to suppuration and ulceration of its coats, accidents that usually hasten on to a fatal termination.

224. The principles of medical treatment, for preventing or retarding the growth of a calculus in the bladder, have been already explained (123. and 140.), regulated by those appearances in the urine, indicating the nature of the prevailing diathesis. Some few remarks may now be made upon the mode in which certain medicines appear to operate in the fulfilment of these purposes.

225. The symptoms arising from stone in the bladder, are very generally alleviated, and in some instances removed, by the exhibition of alkaline remedies, which may occasionally be given to such an extent, as to render the urine manifestly alkaline,

and capable of exerting some degree of solvent power, upon calculi of a certain description. But it rarely happens, that they can be given to this extent for any length of time, from their deranging the digestive functions, and sometimes exciting irritation and distress in the urinary passages. Considered therefore as solvents, the alkalies are now rarely used ; they are employed merely to relieve symptoms, or prevent the increase of the calculus, by checking the evolution of uric acid.

226. The influence these remedies are capable of exerting in these cases, extends, I believe, far beyond the mere prevention of excess of uric acid in the urine. There is sufficient evidence that they possess a decided power in lessening irritability of bladder, and of allaying its excitement, even where it has proceeded to the extent of inflammation.

227. Examinations after death, where a calculus that had long tormented the patient has become harmless, either spontaneously or from using alkaline medicines, have shown that the stone has become harmless by the bladder forming a pouch, into which the cause of irritation has been received. (202.) The state of the bladder also, where alkalies have been exhibited, is entirely changed, for instead of being found, as dissection teaches every irritable bladder must be, contracted, thickened, and highly vascular, it frequently appears larger than common, relaxed, soft, and pulpy, and sometimes even gangrenous internally ; not that gangrene supervening upon excessive action, but a chronic change derived from extreme debility in the vital powers of the part, and totally unconnected with any appearances of preceding excitement, effused lymph, or ulceration of the inner membrane. The result of Mr. WATSON'S experience upon this point was, that a person long afflicted with stone, if he has taken solvents for any continuance, generally has a very tender, relaxed, and weakened bladder ; which should be considered, and every

examination with metallic instruments, be conducted in the most gentle and careful manner.

228. The power of alkaline substances, to prevent or check the evolution of excess of uric acid by the kidneys, affords a striking instance, in which the functions of the living system are obedient to the known laws of chemical affinity; I am induced to think, that in the relief of the symptoms of stone by alkalies, the operation of the same laws may be traced somewhat farther.

229. The genius of Mr. HUNTER led him to conclude, that the blood, containing as it does, the elements of living matter, must in itself possess a living principle, that its spontaneous coagulation is a proof of vital power, and that this being the first step towards organization, blood recently coagulated must be regarded as still alive. Upon this principle, the albuminous part of a coagulum of blood, may be considered as under circumstances nearly similar to those of albuminous matter or muscular fibre, already laid down in the various structures of the body; and that much the same measure of vitality is enjoyed by this substance in both states, allowing for its being destitute in the one instance of certain appendages it possesses in the other, blood-vessels, nerves, &c.; and, consequently, such experiments as tend to illustrate the effect of chemical agencies upon the albumen of the blood out of the body, will also elucidate the principle on which the same substances operate upon the irritable and muscular fibre in the living system.

230. Now experiment demonstrates, that acids have invariably more or less power in promoting and confirming the coagulation and contraction of the albuminous part of the blood, while alkalies on the contrary, tend to weaken or prevent coagulation: indeed, in a concentrated state alkalies are capable of dissolving albumen, subsequent to its having assumed the solid form; and the power which pure or caustic alkali exerts, applied to the living body, producing immediate decomposition

by disturbing the arrangement of its elements, affords a strong proof that all organized matter is liable to be affected, even to destruction, when exposed to the influence of the more powerful chemical affinities.

231. Upon these grounds, it certainly appears to me, that although much of the good resulting from the exhibition of alkalies, in allaying the irritation from stone, may depend on their diminishing the secretion of lithic acid, they principally operate through the medium of the urine, by slowly abstracting from the inner surface, and muscular structure, of the urinary bladder, a certain proportion of its excitability, upon this principle diminishing not only the disposition, but the power also, for contraction and excitement; for contraction of the muscular coat, and inflammation of the inner membrane, both dependent on high tone, go hand in hand, are aggravated by the same causes, and relieved by the same means.

232. The exhibition of the alkalies have been observed frequently to create so much derangement of stomach, as to prevent their continuance, and in most cases they prove so unpleasant, as to ensure the patient's laying them aside very soon after the symptoms give way; and should the calculus in the mean time fortunately have dropped into some recess or pouch in the bladder, the happiest effects frequently follow.

233. The state of the stomach in this case, very effectually induces the patient to select the regimen best calculated to enable the constitution to recover its wonted vigour; by the same means, the tone of the bladder is also progressively improved, the first effect of which improvement is a degree of contraction excited around the calculus in the cyst; and as the muscular fibres naturally contract most, where the resistance is least, the orifice soon becomes the smallest part of the sac, and this circumstance explains why a calculus once encysted, rarely becomes again troublesome to the patient.

234. Where, however, neither the alkalies, lime water, soap, acidulous soda water, or caustic alkali, nor opium, hyoscyamus, or other narcotics, afford relief, the case may require the performance of the operation for lithotomy; a measure warrantable under certain circumstances only.

235. In the first place, it must not only be clearly ascertained, that the symptoms have been produced by a calculus, from its having been distinctly felt by the metallic sound, or other instrument passed into the bladder; but it must also be distinctly felt by the sound or staff at the commencement of the operation, for a stone long loose in the bladder, may subsequently become encysted, and should this change take place just before operating, the surgeon may be completely foiled in his attempts to find the calculus; and as to the sensation produced by the end of the staff passing over a hard, rough, or even calculous surface in the cavity of the bladder, even this may prove deceptive. A patient has been repeatedly examined by various surgeons, and the sound clearly perceived to grate upon a calculous substance, and upon the performance of the operation, no stone has been found, the deception having arisen from the instrument coming in contact with adherent gravel, giving the peculiar sensation mistaken for stone. Indeed this serious mistake may occur even without the presence of gravel. Such a case, recorded by DESAULT, occurred in a child, who for six months had with great difficulty voided his urine. The sound appeared to strike a hard body, and from the rectum it was supposed the calculus was distinctly felt. The operation performed and the bladder opened, the forceps were introduced, and to the surprise of the operator, no stone could be found. The child suffered excruciating pain, the attempts to find what did not exist, being continued for the space of half an hour. Convulsions supervened, and the patient in twenty-four hours expired. The bladder, in

which there was no stone, was contracted, compact, and of a cartilaginous firmness. The surgeons present all agreed that the collision they felt by introducing an instrument, might in this case have imposed on their sensation. *

236. In the second place, the state of the patient's general health must be considered, previous to determining on the operation. If the constitution appears good, with the exception of symptoms known to be produced by the irritation of calculus, proper medicines, aided by rest, will generally succeed in bringing the health into a favourable state; whereas, if on examining by the rectum, the prostate is found much enlarged, or if it is known to have been long diseased, where there have been fistulous abscesses in perineo with disease in the urethra, or severe sympathetic complaints, with tedious racking fits of pain about the lumbar region, and other symptoms of calculi in the kidney (168.), or where from any cause the strength of constitution is gone, the operation for lithotomy should not be recommended, nor ever performed, unless at the earnest solicitation of the patient; much, however, in the determination of this important question, must rest with the professional talents and judgment of the surgeon.

237. The operation for the stone, the only radical cure for the complaint, has been variously performed, at different periods of time; and most of the alterations successively suggested, may be considered as so many improvements in the art of surgery.

238. The earliest idea was that of cutting out the stone at the perineum. Two fingers introduced into the rectum, enabled the operator to press the stone forward against the perineum, and the wound made with a knife, was enlarged sufficiently to allow the calculus to be protruded into

* Journal de Chirurgie, tom. ii.

it; and the stone then hooked out, the operation was finished. This was the mode adopted by CELSUS.*

239. This operation was, however, liable to many objections and dangers, the principal of which were removed by HILDANUS, who first proposed the introduction of an instrument by the urethra into the bladder, to serve as a director in the operation. There were, however, still considerable difficulties in cutting through the perineum, so that it was at length proposed to extract the stone by cutting into the bladder, above the pubes; this particular mode, termed the high operation, was first introduced by PIERRE FRANCO, in 1561. The obvious risk, however, of opening into the cavity of the abdomen, and the consequences likely to ensue from this accident, were so many objections, tending to prevent this mode of operating being generally adopted.

240. The original idea of the operation now in use, appears to be derived from that proposed and practised in France, by FRERE JAQUES, who, in 1697, taught in Paris his method of cutting for the stone. Passing a large staff into the bladder to direct him, he plunged a short dagger-shaped knife at once through the perineum into the bladder, and then removed the stone with the forceps.

241. The striking feature of improvement in this operation, was the superior boldness and decision with which it was performed, by which an ample and adequate wound was promptly made into the bladder, instead of having recourse to the means previously in use, for dilating, or rather tearing open, a small, and inadequate wound. FRERE JAQUES latterly adopted the grooved staff in operating, and it is astonishing, how constantly successful his operations were, subsequent to this period.

* Lib. vii. cap. 26.

242. CHESELDEN performed the operation by dividing the same parts now cut through with the gorget ; but he chose rather to make his section in the opposite direction. Instead of exposing the groove of the staff at the membranous part of the urethra, as is done in the present day, and then dividing the prostate and body of the bladder, he struck his knife first into the bladder, found the groove in the staff, and so divided upwards, cutting through the prostate gland and neck of the bladder. By this means he was sure to avoid any risk of wounding the intestine.

243. The use of the cutting gorget was first introduced by Sir CÆSAR HAWKINS ; and the following account of the present mode of operating with that instrument, will be found to differ in no material point from the operation performed by that surgeon.

244. With a view to the performance of the operation for lithotomy, some preliminary attention may be occasionally required. The plethoric patient should lose blood, and take cathartic medicine. A few hours previous to operating, a laxative enema should be thrown up, to ensure the rectum being empty, and to lessen the chance of its being wounded in the operation.

245. It is generally held an advantage that the bladder should be partially distended with urine at the time of operating, on which account, the patient should retain his water, for some time before. It is also essentially necessary that all the instruments that may possibly be wanted in an operation of so much importance, should be ready at hand, and laid in order upon an adjoining table.

246. The instruments that are, or may be required, will be the following ; a cutting gorget, and several grooved staffs of various sizes, the groove of each being accurately fitted to the beak of the cutting gorget ; several scalpels, one of

which will be necessary in the commencement of the operation; forceps, of various sizes and forms; a probe pointed bistoury, for enlarging the section through the prostate gland, if the division effected by the gorget be not sufficiently free; a large syringe for injecting the bladder, washing out clots of blood, or broken fragments or particles of the stone; a scoop should also be at hand, as occasionally useful for the same purpose; and, lastly, the garters necessary for securing the hands and feet.

247. Considerable difficulty is sometimes experienced in getting the staff into the bladder, after the patient is upon the table, and as any delay at that time unavoidably lengthens the period of alarm and terror, the staff had much better be introduced, and the stone again felt, so as to be certain of its being in the bladder, previous to his being bound.

248. The patient placed upon the table, his wrists are brought down to the outsides of his ancles, and firmly secured there by the garters; the knees bent, and the heels brought back against the buttocks.

249. The assistant supporting the scrotum with the left hand, is with his right to hold the staff, so as to make the curve of the instrument project towards the left side of the perineum. The first incision should commence below the bulb of the urethra, opposite the membranous part of that canal; at the point where the operator intends to expose the groove of the staff. This incision should extend three or four inches downwards, to the left of the raphe of the perineum, at equal distances from the tuber ischii, and the anus. The next object, is the division of the transversalis perinei muscle, a circumstance essential in the operation. The point of the knife is then to be passed into the groove of the staff, puncturing the urethra, and exposing the groove of the instru-

ment as near as possible to the prostate gland ; in doing which, the knife should be made to divide the urethra as far as possible along the groove of the staff, towards the bladder, a precaution, that if properly attended to, prevents the risk of the beak of the gorget being entangled by the soft parts, which would endanger its escaping from the staff, and passing in a wrong direction. The knife laid aside, and the beak of the gorget accurately and securely set in the groove of the staff, the operator takes hold of the handle of the staff himself, raising it up from the groin, till the handle of the staff forms a right angle with the body of the patient. Before pushing on the gorget, however, the beak should be moved backward and forward a little, to ascertain its being fairly and freely placed in the groove. The bringing forward the handle of the staff, so as to raise its point in the bladder, is a circumstance of the highest importance ; for regulated by this the gorget, the handle of which must be somewhat depressed as it passes forward, will be so introduced, as to pass on into the bladder, in the proper line of the axis of the pelvis, by which care, the risk of wounding the rectum is avoided.

250. The gorget, fairly in the bladder, may be again withdrawn, and the staff also being removed, the forceps should be immediately passed ; and whenever the finger can be made to reach the stone, it will prove the most useful of all directors, for the application of the blades of the instrument. Where this, however, cannot be done, the stone may be repeatedly touched with the blades of the forceps, previous to their being opened, so as to enable the operator not only to ascertain its precise situation, but to determine in some degree its probable size and figure, before attempting to grasp it with the instrument.

251. Sometimes the fundus of the bladder will require to be supported, and raised up a little by two of the fingers of the left hand, introduced into

the rectum, to enable the forceps to take a fair hold of the calculus.

252. In the first attempts to extract the stone, the greatest care should be taken to press the blades of the forceps together, as lightly as possible, unless it has been previously ascertained that the texture of the calculus is compact and hard, when this caution becomes of less importance.

253. The figure of a single calculus is generally more or less of a flattened oval, and when it is large, it becomes an object of consequence that it should be so settled between the blades of the forceps, that its long diameter, or axis, shall be parallel to the length of the instrument, that it may be removed with the least possible difficulty or violence.

254. Many contrivances have been suggested for the purpose of breaking up and crushing a stone in the bladder, when too large to admit of extraction; some of these instruments exhibit great ingenuity, but they have, I believe, in no instance of real difficulty, been found to answer the purpose for which they were constructed. The breaking a large calculus to pieces out of the body, and the application of a complicated instrument around a large calculus in the bladder, amidst the pain, hæmorrhage, and difficulty of an operation for stone, are very different things; the one may be perfectly easy, the other altogether impracticable.

255. The stone, when extracted, should be carefully examined, as its appearance will in general point out whether there are other calculi, or not. If any part of its surface be particularly flattened, or smooth, it is probably the result of friction with another calculus; and the bladder must be attentively and repeatedly examined, to ascertain whether this is the case. The examination of the cavity of the bladder should always, as far as possible, be made with the finger, to learn whether any loose fragments of stone, any adhesive mucous

deposit, or sabulous matter remain behind ; for, in either case, the bladder may require to be well washed out by the syringe and warm water. Experience has shown that either of these substances may, if neglected, become the nucleus for a future stone to form upon.

256. The hæmorrhage that occurs either in, or immediately subsequent to the operation, may sometimes require such pressure locally as may prevent its continuance, or perhaps the dilatation of the wound, in order that, if possible, the artery may be taken up. Where the first expedient will answer, it is preferable for two reasons ; it is more expeditious, and it conveys less alarm to the mind of the patient. It may be effected by the introduction of an adequate piece of firm dry sponge into the whole depth of the wound, and as this absorbs the moisture, it will continue to swell, until the bleeding subsides. It is, however, necessary to recollect, that when the tent is subsequently removed, the bladder should be carefully examined, to ascertain that no coagulum of blood is left within its cavity.

257. After the operation a simple pledget may be placed over the wound, and retained in its place by a bandage. The patient may then be laid in bed either upon his back or side, with his thighs closed ; and a large opiate given.

258. Some care will be necessary in so disposing folded cloths and blankets upon the bed, as to receive the urine flowing by the wound, with as little exposure as possible to the chance of the patient's taking cold from the constant moisture of the parts ; from the neglect of this precept I have known an instance in which severe cold, presently followed by inflammation of the peritoneum, came on, and the patient died.

259. Inflammation of the bladder, extending itself to the membrane lining the cavity of the abdomen, forms one of the most serious dangers,

subsequent to the performance of this operation. The most unerring sign of this event is a degree of tenderness, more or less considerable and extensive, spreading itself over the region of the abdomen, from the immediate seat of the urinary bladder.

260. Should this peculiar tenderness arise, the pulse, which in this case generally proves deceitful, must not be at all depended upon ; it will feel weak, small and languid, but leeches, repeatedly applied, and even the lancet, if the pulse will at all admit of it, will bring relief, and, together with fomentations, aperient medicines, and the strictest abstinence, will form the plan on which we must depend for saving the life of the patient.

261. The gorget is on some accounts a convenient instrument, but many surgeons are of opinion that from its having been repeatedly found, even in the most expert hand, liable to slip from the staff, or without this accident subject to inflict a second wound through the bladder, it should be altogether laid aside ; particularly as the operation may be just as well performed by the knife alone.

262. An ingenious mode of operating with the knife has been described by Mr. BURNS, in which the operation commenced as for the gorget, is finished by means of a second staff, introduced through the wound in the membranous part of the urethra, the knife and staff the being brought out together by the perineum ; and this, if properly executed, prevents the possibility of accident. But the fact is, that if the surgeon is sufficiently attentive and careful in operating, there can be no occasion for a second staff at all ; for if the first incision is conducted in the manner above directed in operating with the gorget, and the first opening which must be freely made by the scalpel, in the membranous part of the urethra, be then carried through the prostate gland and as much as is necessary of the exposed part of the bladder, by setting the back of the knife towards the groove of the staff, the operation will be finished in the manner

in which I have once performed it with success, and in the manner already recommended by several excellent surgeons.

263. The operation for lithotomy is rarely if ever required in females, a circumstance that depends on the organization and functions being more simple in the female, than in the male urethra. The office of the male urethra is two-fold ; it must afford a constant conveyance for the urine, when the bladder is relieved of its contents ; and has also another important duty to fulfil, in the occasional expulsion of the semen ; and for the performance of this latter function, a complicated structure of the parts immediately surrounding the canal was required. The only purpose of the female urethra, on the other hand, is to allow the urine to pass off, upon the natural impulse being given, for which reason the female urethra is extremely short, simple in structure, and capable, in some instances, of admitting of a degree of dilatation, which, if the facts were not authenticated, would scarcely be believed. (Case 24.)

264. Should the symptoms of stone in the female require the extraction of a calculus from the bladder, the first point of regard will be to allay irritation, if present ; after which, the urethra may be relaxed by one of those instruments ingeniously contrived by Mr. WEISS, of the Strand, for this purpose ; and when the operator has thus been enabled to determine the figure and magnitude of the calculus, by examining it with his finger, he will more readily decide whether a partial division of the neck of the bladder, or further dilatation only, will be expedient for finishing the operation.

265. The constitution will in most instances bear the irritation and distress produced by stone for a very long time, still retaining the power of recovering itself, upon the removal of the disease. In one case a child six years old, who had been at times in the most severe torments for more than two years, reducing him to a skeleton, was cut by

Mr. WATSON, and an oval calculus, rough and irregular upon its surface, apparently made up of smaller masses of gravel, intermixed with shining crystalline particles, removed; weighing near an ounce. The patient did perfectly well. The same surgeon operated for stone upon a boy of eight years, troubled with the disease from three years old. He seldom got a night's rest, frequently made bloody urine, and was greatly reduced; but still any interval of ease restored him to good spirits. The calculus, angular and rough, weighed three drachms. The patient recovered perfectly in about six weeks. In another boy of twelve years, who from a year old had suffered from symptoms of stone, a mulberry calculus was removed, weight not mentioned; but Mr. WATSON expresses his surprise that a calculus so long in forming should have been found no larger.

266. The operation for lithotomy occasionally derives its most serious importance from the magnitude of the calculus; a circumstance which in some instances may even impede or prevent the introduction of the staff. In most of these cases the scalpel is a more handy, and safe, although perhaps rather less expeditious instrument, than the gorget, for performing the operation. A calculus, exceeding ten ounces, was thus extracted by Mr. DICKINSON.* In another case a stone, weighing more than fourteen ounces, was extracted broken from the bladder, by Mr. C. MAYO of Winchester; the removal was a work of much difficulty, and must have required great dexterity and perseverance. The manner, however, in which both these operations were performed, is best attested by the circumstance of each of the patients having happily recovered; although the extreme fatigue and exhaustion from the intense pain incident to such operations, were of course got over with difficulty.†

* Med. Chir. Trans. vol. xi.

† Ibid. vol. xi.

267. A calculus will in some rare instances attain an enormous magnitude. One is upon record, the removal of which was attempted during life; but the patient died in the operation. Extracted after death, the stone weighed fifty-one ounces.* A highly interesting and instructive case of this kind has been recorded by a late eminent surgeon, Sir JAMES EARLE†; and the calculus, which weighed forty-four ounces, is deposited in the Museum of the Royal College of Surgeons.

268. In some instances, it appears to me that patients, in other respects doing well after the operation, have been lost in consequence of the indirect and latent influence of the calculous diathesis, inducing some sudden and severe indisposition, when least expected. Such I think was the case with a shipwright, aged 57, cut by Mr. JUSTAMOND in the Westminster Hospital. In *May* 1781, he felt uneasiness in passing water, and voided gravel in such abundance that he used to catch it in his hand, more than half a tea-spoonful at a time. The general appearance was that of a fine red sand, though sometimes at the bottom of the chamber-vase he found a deposit of a whitish cast, more like chalk. These symptoms had continued about a month, when for a few hours retention of urine came on, but was removed by fomentations. The next day he parted with a small stone, a quarter of an inch long and one-eighth broad. In *June* he applied to a Jew, who pretending to cure him, had injected a white liquor, which brought on prodigious discharge, and, as he said, burnt up and contracted the passage, as if he had had a fire in him, so that he very wisely laid aside that plan. In *July* 1782, he voided another stone the size of a pea; and had undergone a course of lime-water. He was cut *Aug.* 31. 1782, and *Sept.* 20 was in a very fair way of recovery. The stone of a flattened form, broader

* Phil. Trans. vol. xix.

† Ibid. 1810.

than a shilling, had a brown, compact, granulated surface, with a very large chalky nucleus; "so that once a soft stone, it afterwards became a hard one." When the wound was nearly healed, he unfortunately took a fever, and died just a month after being cut. On examination, nothing remarkable was observed, but a little inflammation of the intestines.*

269. In some cases, although very rarely, the cavity of the bladder, from the irritation of stone, has become partially contracted; the space being divided in the middle, something in the form of an hour-glass. Mr. JACK has related an instance in which this viscus, under the usual symptoms of stone, was found thickened, compact, and divided by a middle contraction into two cavities; a smaller at the fundus, containing a considerable quantity of sanious, foetid, and bloody matter; a larger, including the remaining part of the bladder, and containing a calculus of very singular form. One oval portion of the stone, the size of a pullet's egg, exactly answered to the figure of the cavity at the fundus of the bladder, to the extremity of which was attached by a narrow neck another portion of stone, placed transversely with respect to the former; the communication between the two cavities of the bladder corresponding to the small neck joining the two parts of the stone. The inner surface of the bladder in some parts covered with gravel, had the feel and appearance of sand-paper; in other parts it was ulcerated, and at some points concealed by fungous excrescences. The kidneys were enlarged and flaccid, especially the left, which contained a great quantity of pus, of the same quality and appearance as that in the bladder. The oval calculus was apparently the earliest formation, of a dark brown, compact texture. The remaining irregular and last formed portion was softer, in parts

* From a MS. of Mr. WATSON's in Mr. HEAVISIDE's Museum.

laminated, but mostly granulated, spongy, and of a light grey colour. It was presumed the brown oval calculus had first formed in the fundus of the bladder, the lighter coloured deposit forming the irregular portion having been a subsequent process; and that in the last fit, by some violent spasm at the fundus of the bladder, the calculus was displaced.*

270. Too much care cannot be bestowed upon keeping the bed dry as possible, for it now and then happens that the patient takes cold, and is lost by the accident. Mr. WATSON mentions a man, aged 58, a hard drinker, whom he cut for the stone after seven years of occasional distress; and extracted a mulberry calculus, the size of a large gall nut. The following day, the abdomen somewhat tense, the nurse fomented with cloths too wet, leaving his shirt, and bedding very wet; from which it was believed he took cold. On the morning of the fourth day he died, almost suddenly; having been very free from complaint the day before. On dissection, the right kidney, wasted to one-third its natural size, contained a tea-spoonful of pus. The left of its natural size, contained a little pus, and one very small stone. It had also several hydatids in its substance. The lower part of the omentum formed a scirrhus tumor, united to the fundus of the bladder. The bladder itself was sound; the vessels on its internal surface rather turgid. The wound looked well; neither was there inflammation of peritoneum, or intestines. The cellular membrane round the rectum was diseased, from a fistula in ano, which he had upon him, when cut. There was also a good deal of matter in the diseased cellular membrane, but none near the neck of the bladder. In this instance, however, although cold probably hastened the unfortunate termination of the case, it is doubtful whether his state of constitution, independent of such an accident, might have admitted of eventual recovery.

* Edinb. Med. Journal, vol. viii.

271. Where stone in the bladder has long harassed the constitution, circumstances extremely unpropitious for operating may be present, although unknown; most happy is it when, under this predicament, the intervention of some ill symptom spares the patient the misery of suffering, and the operator the distress of performing fruitlessly, so painful an operation. A child, aged seven years, was to have been cut for the stone; when the performance of the operation was prevented by a severe attack of fever coming on, of which the patient died. The calculus was however extracted by the operation, after death; it was so unusually large a stone, for the age of the boy, that it was even then with difficulty brought away. On opening the body, the kidneys, both diseased, were of a yellowish colour, and in parts of a steatomatous consistence; the right ureter very much dilated. A large tumor, formed by a quantity of blood collected and coagulated in the cellular membrane round the bladder, was found adhering to its fundus, filling up almost the whole cavity of the pelvis. A good deal of purulent matter had run out by the wound, with the urine, so that under all the circumstances of the case it is scarcely possible he should have done well, had the operation been performed.

272. The operation for lithotomy requires, in order to its being performed well, not only a steady skilful hand, but some degree of feeling, and every regard to tenderness and gentleness. I have myself stood by, many years since, while a surgeon attempted to cut for the stone a child of eight years of age; his nervous embarrassment every moment increased; he felt that he was foiled, yet would not consign the care of finishing the operation to another. The stone was not found; the child died in a day or two; and the body was not examined.

273. Gentleness is, however, almost as essential as steadiness; Mr. WATSON was present at the operation for stone upon a fine healthy boy, ten

years old. It was a tedious business, the bladder being very roughly handled, and the stone extracted at last with very great difficulty. The poor child endured it with a patience hardly to be expected, though he certainly felt very severely; more, it appeared, from the frequent introduction of the instruments, and their rough application, than any thing else. The stone, a flattened oval, partly smooth, weighed two ounces and two drachms. The next morning the boy had every alarming symptom, great tension of belly, pain, restlessness, vomiting, convulsions; during the forenoon he died.

274. Upon one occasion, however, it was Mr. WATSON's lot to witness a scene of this kind, more than commonly distressing. The patient a physician; the operator a distinguished hospital surgeon. *Aug.* 21. 1790, Mr. WATSON assisted at the operation for stone upon Dr. W., who for seven years had been afflicted with nephritic pains; for the last five years they were more violent; for the last three so intolerable, that by the advice of his friends he took all sorts of medicines, as solvents. At times he brought away small particles of stone, but continued nevertheless to suffer such torment that he determined to undergo the operation, let the event be what it might. Mr. WATSON had several times relieved him by drawing off his water, and thus had ascertained the existence of a stone. The operation was performed by Mr. * * *, with his double gorget; an ill-formed instrument, that makes but a small opening in the neck of the bladder, hardly dividing the prostate gland at all. The opening made by the gorget was so small, and the forceps so large, he missed conducting them into the bladder; but supposing they were in the bladder, the stone was searched after up and down, and all round in every direction, with a good deal of violence; but no stone was found, the forceps having passed between the bladder and rectum. After a long examination, it was given up; concluding there

was either no stone, or it was not to be come at. At length Mr. WATSON was desired to examine, who taking out the large forceps, passed his finger into a large cavity where he could feel nothing; but directing his finger to the prostate, found it partially divided, and then passed his finger into the bladder, and felt the stone. He then introduced a pair of long flat forceps, and engaged the stone, it slipped, but taking hold of it a second time, said to the operator, "Now I have hold of the stone, you shall extract it," offering him the forceps. "But" said the operator, "you can never extract it with those forceps;" and again taking the large forceps, they as before passed between the bladder and rectum; where of course they could not reach the stone, but much bruised the bladder between the forceps and the stone, as the blades stretched wide, were turned in every direction, very forcibly striking against all the soft parts. The patient, by this time much fatigued, was put to bed, in expectation the stone might present itself next day, more favourably, which was not however the case. No urine passed, by the wound, or penis, from the time of the operation, than which no symptom could be more alarming; a sure sign that if any came down into the bladder, it passed off some other way. He complained next day of pain in the stomach, and threw up his food and medicine; things became worse and worse, the pulse flagged, the extremities became cold, his voice failed, and he died on the 4th day after the operation.

On examination, the bladder was found lacerated in two places through and through, at its posterior part next the rectum, so that the urine had passed into the cellular membrane. But before the bladder was opened, Mr. WATSON introduced a common gorget, and upon that a pair of forceps, and took fast hold of the stone, but before he could get it out, was obliged to dilate the wound in the neck of the bladder, a little, with a scalpel, and

then it was extracted without much force. The calculus was of the size and form of a large walnut. *

275. Calculus, as already remarked, sometimes forms, without the patient being at all aware of its existence. An instance of this is mentioned †, by Mr. CHAPMAN, of Wandsworth, who took, by excision, from the bulbous part of the urethra, a calculus of pretty large size; though the man, having never felt pain or difficulty in voiding his urine, had not the least previous idea of being subject to stone. This gentleman has since kindly informed me that the stone, composed of oxalate of lime, is of the size and form of an unripe mulberry; weighing 18 grains.

276. The urinary bladder, under peculiar difficulties, occasionally evinces extraordinary powers, like most other parts of the human body, for relieving itself, in calculous, as well as in other kinds of disease. A case is recorded by Dr. FREWIN, of a patient, aged 76, who after the usual symptoms of stone, and for many months a tumor in the perineum, which prevented him from sitting up out of bed, was relieved by the skin giving way, from the lacerated part of which fell a calculus, weighing above six ounces; after which, the patient recovered. ‡

277. A particularly interesting and curious case is related by Mr. MACKARNES, illustrating in a very extraordinary way, the extent of mischief that may sometimes be sustained, without material injury to the ultimate powers and functions of parts. A healthy woman had three children born, with a large and deep depression on the side of the head. Two months after the last lying-in, fever, violent pains in the loins, back, and neck of the bladder, came on. She was bled, purged, and directed in-

* From a MS. (No. 9.) of Mr. WATSON's, in Mr. HEAVISIDE's Museum.

† Med. Chir. Trans. vol. xii.

‡ Phil. Trans. vol. lii.

jections. Still disposed to costiveness, the fæces came away, flattened like the leaves of houseleek. Thus she went on for months; when the urine became foetid, and slimy. Opiates alone, relieved her pain. The urine, with foetor intolerable, now contained purulent matter, in great quantity, as from an ulcer in the bladder. A catheter was passed, and a hard swelling perceived above the left groin. After some time, and much distress, the foetid and purulent discharge was transferred first to the vagina, and then to the rectum and anus; and she now complained of a prodigious weight; and having suffered for six months in this way, she frequently had bloody stools, once to a profuse quantity. One day, straining hard on the night-chair, she thought she felt a hard substance ready for expulsion. She sent for her neighbours, who found a hard substance laying against the sphincter, so large and rugged, that it tore one of the women's fingers, and made it bleed. A surgeon sent for, broke some of it off, but was forced to dilate the opening of the bowel before he could extract a calculus eight ounces and a half in weight, and ten inches and a half in circumference. From that moment, the woman became easy; the wound healed, and she recovered perfectly. *

CASE 23.

Mulberry Calculus, adherent to the Bladder.

A YOUNG man, who was cut for the stone, at the age of 24, had, from childhood, been subject to uneasiness and pain in passing his water, which, for many years, had occasionally deposited a red sand. In 1800, he consulted Mr. HEAVISIDE, who, from the symptoms, believed there was a stone in the bladder. A sound was passed, and the stone felt. His habits were frequently intemperate, and he was sometimes inconvenienced by slight

* Phil. Trans. vol. xli.

asthmatic attack; in other respects, his health was good. He underwent the operation, *February 15. 1800.* On cutting into the bladder, Mr. HEAVISIDE found the calculus firmly adherent to its cavity near the neck; this adhesion, however, was, by degrees loosened, and the stone extracted.*

The calculus, which was of the mulberry kind, was the size of a chesnut; upon the hard, uneven part of its surface was attached a soft white substance, which had formed the medium of adhesion, and which, from its appearance and texture, was evidently coagulable lymph, effused as the accidental consequence of preceding irritation.

The young man recovered perfectly from the operation, and lived thirteen years afterwards, free from any return of the disorder. Latterly, much addicted to drinking, his asthma increased, and of this he died in 1813.

CASE 24.

Singularly large Calculus, voided spontaneously.

AMONG other specimens in a collection of near 400 urinary calculi, in Mr. HEAVISIDE's Museum, is a concretion of very considerable magnitude; remarkable from its appearance, but more so from the circumstances of its history.

It was formerly in the possession of Mr. WATSON, whose memorandum states the calculus to have been received, with the following particulars, by Dr. GRAY, from Dr. ALONZO DE CAVALLO, a physician at Lisbon; he received it from his brother, a surgeon at Bahia in Brazil, at which place it was voided, without any medical assistance, by an old black woman. Previous to its coming away, she had for some time suffered excruciating pain, and remained ever after subject to incontinence of urine.

The calculus is of an irregular oval figure, and

* PLATE III. *Fig. 1. and 2.*

weighs four ounces six drachms, troy weight. Its section exhibits a loose friable texture, made up of a small proportion of the phosphates, with a large quantity of mucous matter, forming the nucleus of the stone, round which, successive courses of the phosphates have been laid. Latterly, it appears the calculus had taken up some comparatively fixed place of abode in the bladder, in consequence of which, the stream of urine constantly making its way over one part only, had given rise to a partial accumulation or growth, upon one of its sides. It appears probable, also, that the large spaces between the masses forming the external part of the calculus must have been owing to the particular consistence of the mucous matter at these points, around which the phosphates were deposited. *

An interesting account of a large calculus, voided in a similar way, has been published by Dr. YELLOLY. †

CASE 25.

Stone in the Bladder.

A GENTLEMAN, at the age of 67, consulted me, in 1820, for symptoms indicating the presence of calculus in the bladder. He had, for the last 30 years, been subject to red gravel, especially after any journey, or shaking in a stage-coach, when he discharged near a tea-spoonful at a time. When still and quiet, these attacks were less frequent and severe. Of late years, he had become subject also to a white-coloured gravel; this he had observed but rarely; but once, in particular, he felt something sharp passing, and watching, he found it in the opening of the urethra; it was white, larger than a pin's head, and like a fragment of chalk.

For some years past, subject to bloody urine, he had occasional fits of difficulty and extreme pain

* PLATE III. Fig. 3.

† Med. Chir. Trans. vol. vi.

in voiding it, especially in frosty weather. The pain, just after the effort to pass water, was most severe, and sometimes altogether useless; and yet he had no power of retaining it, during the spasms. Several years since, he had, while heated with exercise, drank very stale beer, at a country inn, which produced pain, and so much swelling, that he thought he should have died; with difficulty, some aperient medicines were made to operate, to his relief. Several months after this, he had retention of urine, after brisk exercise. A surgeon of some reputation, passed an elastic catheter, but found little water. By means of the catheter, a calculus was distinctly felt, which was said to be rough upon its surface. Finding he was subject to stomach complaints, and costiveness, I enjoined him to observe temperance, and directed him an aperient mixture, which he took for some time, with great benefit; but his habits of full living, and excessive eating, his family regarded as evils they were sure must be much against him, and of the consequences of which they were much afraid.

Oct. 9. 1822. This gentleman being in town, requested me to call upon him. I found that for the last twelve months, he had been less able to take exercise than before, and more subject to severe distress from his complaints. A year or two back, the paroxysms would last only an hour; now they continued several hours; during which he could not lay down for severe pain in the right loins. This pain seemed to pass through the hips, producing what he had for years considered to be a rheumatic affection of his hip, knee, and leg, with lameness and retraction of the limb.

During the attack of distress, he had desire to pass water every five or six minutes, which returned, even when the attempt was not made, blood passing generally, but not always. With some difficulty, he allowed an examination to be made by the rectum, although the idea of it threw him

into a violent tremor. The prostate was very distinctly felt, and beyond it, the softer feel of the coats of the bladder; but I could not perceive any sensation of a calculus, or of any hard substance; so that the stone could not, in all probability, have been of a large size. I directed an aperient draught, combined with the volatile tincture of valerian.

Oct. 10. The medicine had operated four or five times, so much to his relief, that he said he had not felt so well as now, for many months. I desired the medicines might be continued, so as to preserve regular and free action of the bowels; repeating at the same time, my former injunctions, with regard to diet.

SECT. V.

On Irritable Bladder.

278. AN intimate and complete acquaintance with the minute, as well as general, anatomy of the urinary organs, will furnish the only ground upon which we can explain the various symptoms and sympathies that take place in the diseases of these parts.

279. By the light of anatomy, we are enabled to perceive on the one hand, that the nerves distributed to these organs, are extremely numerous, though small, and that, in addition to this, there is yet another provision for sensation and sympathy, in the lateral connections, formed by the ganglia of these nerves with each other; while on the other hand, a very general source of sympathetic feeling, in one part for another, is a similarity of structure in the two parts, and in some cases a continued line of similar organization between the two sympathetic points, however remote they may be.

280. This law or principle of action, may be said to be almost universal; it seems to depend

principally upon the particular measure of sensibility and irritability originally assigned to each peculiar structure, in the animal economy; in consequence of which, any impression received upon one membrane is more readily capable of transmission, or in other words, more apt to be translated to some other membrane, than to any other series of parts, of which the body is constituted. It exhibits a striking instance of a certain unison of feeling, if the expression be allowed, that may be traced more or less distinctly in most of the beautiful and interesting operations of nature.

281. The symptoms that attend an irritable state of the urinary bladder, are subject to much variety, dependent on the varying nature, and intensity of the cause. Irritable bladder is, however, constantly productive of more or less constant, or occasional uneasiness, about the region of the bladder, generally with increased frequency in making water; often attended with an excessive discharge of mucous or albuminous matter, from the inner membrane lining that cavity, and a fatiguing anxiety to pass urine. Sometimes the foregoing symptoms are connected with the most urgent tenesmus and straining, so much aggravated in the expulsion of the last drops of water, that the turgid vessels upon the membrane lining the neck of the bladder, occasionally give way, and hæmorrhage follows.

282. A degree of irritation in the bladder is an occasional consequence of external violence, or wound. Experience has also shown that wounds or ulcers (Case 54.) penetrating through the coats of the bladder, and communicating with the cavity of the abdomen, are almost invariably fatal; and it has therefore been generally concluded, that all wounds of the bladder, are mortal. This, however, is far from being the case, as regards gun-shot wounds; and even in those that arise from contusion, laceration, or incision, the patient sometimes fortunately recovers. A case in which a musket-

ball struck the groin, passing completely through the bladder of urine, and making its way out by the opposite buttock, is related by Mr. DOUGLAS. The course of the wound was demonstrated, by the flow of urine and blood by the groin, by the passing of blood by the urethra, and for some time by the passing of urine by both wounds. In the course of the treatment, a splinter of bone, near an inch in length, found its way to the orifice of the urethra, and was removed. In the course of four months, the wounds had healed, and the patient perfectly recovered.*

283. An instance of complicated wounds of the perineum, rectum, urethra, and scrotum, mentioned by Baron LARREY, was followed by twenty-one days' confinement of bowels. As repeated injections and other means failed, the rectum was examined, and found loaded with a large mass of indurated fæces, which, it was evident, must have kept up much irritation in the parts around, and which, with pains and perseverance, was broken up and removed, when the watchfulness, fever, and every other bad symptom immediately gave way, and the patient recovered. † M. LARREY details several such cases, and says, many more occurred, where gun-shot wounds proved to have passed through both the bladder and rectum, by the passage of the contents of both cavities, by the openings, did perfectly well; and that without leaving fistula. He observes that General BON was the only instance to the contrary, owing to the wounds not being allowed to be freely scarified, and to no elastic catheter being kept in the bladder, from which omission, the urine occasionally escaped into the cellular membrane, inducing gangrene. In one case, a wound received from a Cossack's lance, passing across the groin, over the brim of the pelvis, into the bladder, urine flowing by the wound, and blood

* Edinb. Med. Jour. vol. xiii.

† Chir. Militaire, tom. iii.

with urine by the urethra, was followed by supuration and abscess in the course of the wound; but by the aid of the elastic catheter kept in the bladder, a counter-opening made at the groin, proper dressings and constant attention, he perfectly recovered. *

284. The bladder will, under favourable circumstances, recover from very extensive injury; in one instance, this was proved by a severe laceration, in a man tossed by a bull. The wound was at the groin, the horn entering under the femoral ligament, and tearing the bladder, which was full of urine. The inner membrane of the bladder, however, remained entire, and formed a membranous pouch, presenting a herniary tumor under the crural arch, as large as a pullet's egg. The external wound was first enlarged, to bring the protrusion fairly into view; an elastic catheter next passed by the urethra, to empty the bladder; and lastly, the membranous tumor by degrees was reduced into the abdomen. By quietude and care, the man perfectly recovered. †

285. Sometimes a musket-ball, lodged in the bladder, will, after a very long interval, become troublesome. M. LARREY mentions a German soldier, wounded by a musket-ball, passing through the sacrum and rectum, into the bladder. The wound healed in a month, during which time, when he changed his position, he felt something roll and move in his bladder. Occasional sharp pain about the pelvis, remained after the healing of the wounds; but he gradually lost the feeling of any thing lodged in the bladder. Ten years afterward, a calculus was felt by the physicians, at that part of the neck of the bladder traversed by the wound, and the stone, the size of a small pullet's egg, which was removed by the operation for lithotomy, contained the ball in its centre.

* Chir. Militaire.

† Chir. Militaire.

286. In another case of a similar nature, the ball was also felt to roll about in the bladder. An officer was wounded, and the ball felt by the sound. M. LARREY performed the operation for lithotomy, and removed the bullet, on one part of which, a small fragment of bone was found, one of its sides being covered with a layer of blood, the other with a calculous deposit. The wound soon healed, and in a month, quitting the hospital, he joined his regiment. *

287. Where an extraneous body induces considerable irritation; whether this results from the figure of the substance, or state of the constitution, ulceration may take place; and in this way the parts may be relieved, by allowing the escape of the irritating body. Such cases however, to be understood, ought to be regarded with careful and close attention, otherwise their true condition will sometimes remain unknown, till assistance comes too late. In one instance, a woman, for the relief of colic pains, was persuaded to swallow two leaden bullets, one of which, incrusting with a coat of yellowish-red gravel, was, after much irritation and straining, expelled by the urethra, fifteen years afterward. † In another, more serious, mentioned to Mr. WATSON by Dr. ADEE of Oxford, a gentleman was to have been cut for the stone, by a surgeon who had sounded, and, as he thought, had both felt, and heard, the stone. This gentleman had a fistulous complaint some years before, supposed to have left an ulcer, that drained the constitution down to a hectic state, which was one reason for the Doctor's insisting upon his not submitting to the operation; besides which, he had lately voided the pips and kernels of apples and pears with his urine, a convincing proof of a communication between the bladder and rectum. He died soon after, and on opening the bladder, the ends of some chicken bones, he had swallowed, were found within its

* Chir. Militaire.

† Phil. Trans. vol. ii.

cavity; these were the bodies struck by the instruments, deceiving the surgeon. They had evidently passed from the rectum by an ulcerated opening that still remained, from the bowels into the bladder.* There is no doubt on my mind that these bones were the source of all the patient's sufferings; and it seems equally clear, that by a timely examination of the bowel, they might have been detected, and removed, so as to have prevented his subsequent misery and death.

288. In some instances, the constitution appears to be peculiarly prone to run into this ulcerative process; in which case, events similar to the above, may take place, independent of the operation of any very hard substance, as an exciting cause. Mr. YONGE mentions a man, long subject to violent attacks of spasmodic pains in the bowels, who, after a severe fit of pain and distress in the lower part of the belly, with costiveness, spasm, and flatus, found he passed particles of his undigested food with his urine; this state continuing for the rest of his life, a period of eight months.† Mr. HILL, also, relates that a patient of his, a middle-aged lady, from extreme neglect of bowels, had, in spite of remedies, no passage either by stool or urine, for the space of eight days, during which period, she suffered from great swelling of the belly; with most excruciating pain, and almost incessant vomiting. After this, she discharged some urine, mixed with a considerable quantity of fæces. She then had a stool, and the swelling of the abdomen gradually subsided. More distressed by the frequent involuntary escape of wind, than even by the passage of fæces with her urine, she lived about three months; when, from returning tumor of abdomen, she died.‡

289. In such cases as the above, it will be generally easy to ascertain the exact state of the

* From a MS. in Mr. HEAVISIDE's Museum.

† Phil. Trans. vol. xxvi.

‡ Med. Commentaries, vol. ii.

complaint. If the bladder has been wounded, or if, in addition to wound, some extraneous body has been lodged within it, the fact will usually admit of being determined with precision. By the introduction of the sound, we may generally reach and distinguish any hard substance lodged in the bladder, and should that substance have made its way forward from the rectum, the relative structure and position of the parts will almost ensure such opening of communication being formed sufficiently low down to be within reach of the finger. An examination, per anum, will readily perceive any projecting point of bone, or other hard substance, the end of which may, perhaps, still remain sticking in the coats of the bowel, and which, with little pain to the patient, or difficulty to the operator, may be extricated, and quietly brought away. These points of argument I have, however, more fully developed and illustrated elsewhere.*

290. A troublesome degree of irritation in the bladder will arise, now and then, from cold; but this is by no means an ordinary occurrence. Under these circumstances, the principal care must be to determine well the nature of the cause, which being known, reveals the probable facility with which the complaint may be removed. (Case 26.) A much more common, and indeed one of the most frequent, causes of irritation in the bladder, is a disposition to deposit gravel in the urine, the symptoms connected with which disposition, have been already pointed out in the section that treats upon the appearance of gravel in the urine.

291. Few difficulties, in medical science, exceed that which occasionally attends the forming a perfectly accurate definition of a disease. The truth of this position must be felt by every observer disposed to prefer the simple truth of nature to the studied, and sometimes false appearances of art. It was

* Pract. Observations on the Diseases of the Lower Intestines and Anus. Last edition. Longman and Co. 1821.

necessary to enumerate the most usual symptoms of irritation in the bladder (281.), while I am conscious of having sometimes met with cases very imperfectly answering the description; although they have more nearly resembled that, than perhaps any other complaint. Under this difficulty, I have been induced to consider as an instance of partial irritation, a disorder in which the bladder would frequently contain as much as one, or even two pints of urine, very quietly (Case 28.); notwithstanding which, it was of so troublesome a description, as generally to preclude the patient from going into company.

292. Symptoms arising from very partial irritable affections of the inner coat of the bladder, sometimes give rise to much diversity of opinion, where, notwithstanding, the subsequent welfare of the patient mainly depends upon his following the right opinion at last, in the selection of those principles upon which his future treatment must be conducted. Should, under these circumstances, particular appearances occur in the urine, they will, to the eye of attentive observation, materially elucidate the facts of the case; but these also, are open to misconstruction, effects of partial irritation being set down as direct evidence of ulceration. In one such instance I was so happy as to find the opinion I had formed of the disease was, nearly as possible, the same with that of Dr. BAILLIE, who had been consulted upon the same case, much about the same time.

293. Sometimes the most permanent and most distressing affections of bladder, occur in connection with irritability. Affections of all others most lamentable, from their being incident to that period of life which is most interesting, and from their progressively harassing and chasing the unfortunate sufferer out of the possession of every comfort and enjoyment, while they occasionally derive even additional severity from the fearful consideration of

their having little direct tendency to shorten life. Of these affections, which in their history always appear to rest on a peculiar foundation, one instance was attended with much pain (Case 30.); and another was also most distressing. (Case 29.) In a third, a gentleman of the brightest promise in one of the learned professions, consulted me for an affection of sight, for which he had previously been long and largely depleted under the care of surgeons, and oculists, of eminence. No visible external change existing, directed my attention more particularly to the history. His complaint, which very much disabled him from, applying to night study, almost threatened eventual loss of vision. Happily his constitutional health and vigour was yet not essentially impaired; which fortunate circumstance enabled him to bear with perfect ease, and to derive infinite advantage from, the tonic system of treatment; which although the only plan that in such cases appears to me deserving of confidence, is frequently from adverse circumstances incapable of being followed up with much effect. The extreme obstinacy of such cases, even where they eventually do well, is partly explained by the state in which the parts are found after death; demonstrating great relaxation and enlargement, even to a varicose state, of the local venous system. (Case 30.)

294. A painful and irritable state of the neck of the bladder, with sympathetic affections of other parts in its immediate neighbourhood, are occasionally connected with disease in the prostate gland; and though such affections are of unusual occurrence, they always deserve the most serious regard, from the extreme distress with which they are attended. (Case 29.)

295. Irritable bladder, when it is the consequence of disease in the uterus, vagina, or rectum, will be almost entirely dependent on the nature and progress of the primary complaint. Some ex-

tremely interesting and unusual examples of sympathetic affection of bladder, from organic disease in the lower part of the intestinal canal, have been recently detailed in another place.* Where from some complaint in the womb, the substance of that organ falls into ulceration, the same tendency not unfrequently extends itself to the coats of the bladder; in which case it generally happens that the increased severity of irritation to pass urine incident to the progress of ulceration, experiences material relief, upon some violent effort of straining being suddenly followed by incontinence of urine; a change produced by what remained of the coats of the bladder at the point of ulceration having at length given way. (Cases 32. and 33.) These are always distressing complaints, frequently requiring more than all the efforts of medicine or surgery can accomplish, to remove, or sometimes even relieve. In some cases external violence may contuse and injure without lacerating the coats of the bladder; when this happens, ulceration may give rise to the same consequences just described.

296. An interesting case is related by Mr. NORRIS, where irritation in the bladder from an affection of prostate gland, produced the most uneasy and distressing consequences. An external tumor, formed near the anus, was poulticed, and opened, discharging copiously a glutinous sanious fluid, which was thought to come from the vesiculæ seminales. The patient perfectly recovered.†

297. The coats of the bladder sometimes become subject to spontaneous disease. When the inner membrane alone is thus affected, it commonly exhibits either effusion, ulceration, or circumscribed tumors, generally prone to assume, sooner or later, the characters of fungous disease. An instance of this, connected with extreme irritation from gravel,

* Pract. Observ. on the Diseases of the Lower Intestines and Anus. Last edition.

† Trans. of the Med. Society of London.

will be presently related; and Mr. WATSON mentions opening the body of a middle-aged man, whom he sounded in his lifetime for stone, but could find none. He had, however, the symptoms of stone, and frequently passed bloody water, especially for many days before death; which took place from inflammation in the bowels. On examination, the left kidney was small, extenuated, and internally formed into loculi, but containing neither stone nor gravel. The urinary bladder was flaccid, and almost empty. On cutting it open, "it was full of fungous tubercles." The prostate gland was greatly enlarged and indurated.*

298. A strongly marked instance of this disease I met with in a female advanced in life (Case 34.); the symptoms were those of severe irritation, connected with hæmorrhage. The diseased parts are preserved†; and exhibit an interesting specimen of circumscribed fungous tumor. A preparation of a similar kind in the Museum of the Royal College of Surgeons, is that of a relaxed, diseased, and hæmorrhagic bladder, from a man. The inner membrane and muscular coat, particularly towards the fundus, almost entirely destroyed; at which part the peritoneal covering is absolutely diaphanous and transparent. A considerable quantity of the previously contained fungous masses (coagula in the catalogue) are lying loose at the bottom of the glass.

299. A most terrible case of this disease, in a woman, is related by M. LE CAT; in which, after long suffering from pains in the back and loins, symptoms of irritation with pain in the bladder, supervened. These symptoms were referred to stone, but the sound gave no satisfactory evidence of its existence; only bringing away blood, in proportion to the freedom of examination. The ob-

* From a MS. in Mr. HEAVISIDE'S Museum.

† In Mr. HEAVISIDE'S Museum.

struction from soft bodies attached in the bladder was felt by the instrument, and their nature was evinced by the considerable bleeding. M. LE CAT, urged by the extreme pain and frequent hæmorrhages, determined to attempt the removal of the disease, by cutting into the bladder, hoping to discover and take away the stone, if one existed; or at least to remove the fungous excrescences, the existence of which had been pretty clearly ascertained. No stone was found, but several clusters of excrescences were felt, one of which was of firm texture. Many of these were extracted with the forceps. On the eighth day after, the operation was repeated; he found no stone, but pulled away several more clusters, and tops of fungi, crushing the rest. The patient suffered excessive pain, and violent fever followed, of which in two days she died. The object, in these operations, was to bring away or destroy the fungous disease within the bladder, but the extreme irritation produced was such as to prove the impossibility of success. M. LE CAT, with a laudable zeal for the relief of suffering humanity, as well as for the improvement of his profession, afterwards contrived cutting forceps, which, conveyed into the bladder, might more effectually remove such diseases; but it appears to me there is little chance of operating with advantage in these diseases. *

300. Irritable bladder has in some few instances been induced by the growth of hair within its cavity. The source from whence this substance has been derived, having generally remained doubtful, it was natural to suppose it most probably originated in disease of the inner membrane; but in several instances there appears to be ground for believing, that it has sprung from some calculous deposit, previously formed in the bladder. Several instances of hair voided by urine are mentioned

* Phil. Trans. vol. xlvii.

by Sir HANS SLOANE; one particularly of a brewer, who suffered from the occasional passage of long hairs, matted or woven together; passed with great pain, but with little or no calculous matter attached to them. Mr. POWELL relates the case of a middle-aged lady, who after being teased with disordered stomach and bowels, and the evacuation of whey-coloured and foetid urine, passed little masses of hair, mingled with a peculiar viscid mucous substance, and partially crusted with calculous matter. The extrication of these substances was attended with aggravation to the distress and pain in the bladder, from the urine bringing them into contact with the orifice of the urethra. This complaint, which continued long, incurred great weakness, and total loss of flesh.* Dr. WALLACE also met with an instance in which hair was several times voided with the urine; and on the body, after death, being examined, a stone was found in the bladder, large as a goose egg, from some parts of which hairs had grown out. It was thought that the hairs voided during life, which were a great many, and some of an extraordinary length, grew out of that stone; because when the hairs hung out of the urethra, as they frequently did to his great torment, they were obliged to be pulled out, which was always done with a resistance, as if plucked out by the root.†

301. The coats of the urinary bladder, or as it appears to me, the cellular texture connecting the muscular coat to the inner membrane, has sometimes become the seat of fungus hæmatodes, but this is a very rare occurrence. Of this affection, which always connects itself with the most distressing symptoms of extreme irritation, I have only met with two instances. One of these I attended during its progress (Case 36.); the other was that of a lady, at the turn of life, who after seeing several physi-

* Phil. Trans. vol. xli.

† Ibid. xxii.

cians and surgeons of high eminence, placed herself a short time before her death under Dr. HOOPER's care ; from whose prescriptions she derived infinite comfort and relief from pain and irritation ; although the progress of the disease could not be arrested. This lady had been longer ailing than the patient I attended, the progress of the disease having been much slower. In both cases blood passed with the urine, but in Dr. HOOPER's patient this appearance came on later, than in the case I had attended ; neither was there, in the former, external tumor in the seat of the bladder, which tumor was a distinguishing character in the latter. In other respects the symptoms, in both cases, were exactly alike. On examining the body, the appearances in Dr. HOOPER's patient were less striking than in the case I had attended, but in essential points they were much the same. In volume, the tumor of the bladder was about half as large as that I had before met with, neither was it projected so forward, or so extensively adherent to the pelvis, which prevented its being felt through the parietes of the abdomen. The disease in the one case extended upwards by the iliac and lumbal glands ; in the other it had affected only those situated laterally towards the sacro-ischiatic openings.

302. The treatment best adapted for the relief of irritable bladder, will require an attentive regard to the constitution of the patient ; and also to the influence of the local or exciting cause of irritation, if such exist. Irritation so frequently, and sometimes so suddenly, runs on into positive inflammation, that a state of security, by relaxing the vigilance of attention, is always in these cases a state of danger to the patient.

303. Where external violence, with injury, laceration, or wound of the bladder, has given rise to irritation, the usual means for preventing or relieving inflammatory action, must be assisted by the most perfect quietude and constant attention to

prevent accumulation of urine, by wearing an elastic catheter, and drawing off the urine at regular and short intervals.

304. Where a musket ball or other extraneous body of moderate size, is lodged in the bladder, exciting such irritation as to require its extraction, this is generally effected by performing the common operation for lithotomy; provided, however, there is reason to believe the bladder otherwise healthy; its power of expansion being considerable, I should feel disposed to prefer a more quiet and less dangerous mode of operating. With this view, the patient kept quiet in the horizontal position, and requested to drink largely of diluents, the urine retained as long as possible by the voluntary powers, should then be prevented passing, by a small soft compress in the hand of a steady assistant, kept quietly applied upon the urethra, pressing it against the inferior margin of the pubes, just sufficiently to prevent the flow of urine. By this means, with an occasional opiate, if necessary, to diminish uneasiness from distention, the bladder may be brought sufficiently high; and when the tumor is well defined, the integuments may be divided in the direction of the linea alba, above the symphysis pubis, and an opening then made into the bladder, as in puncturing above the pubes for retention of urine (Case 62.); when under the direction of the finger first passed, a pair of light forceps may be introduced, and when the instrument fairly embraces its object, the finger slowly withdrawn, the extraneous body may be immediately removed.

305. The opening required in this operation must, however, be sufficiently free to prevent any necessity for bruising the bladder in the extraction; and as the time for providing a safe and free wound is while the peritoneum is kept high up by the full bladder, the division through the linea alba may be extended to an inch in length, and the muscular coat of the bladder may be then gradually divided

to the same extent, so as to expose the inner membrane, cautiously avoiding wounding it until the whole intended line is laid bare, when the upper point being cut through first, the opening may be extended sufficiently far downwards towards the pubes; the operation being then finished, as above described.

306. By this mode of operating, the great danger of serious inflammation, from the extent and complicated nature of the parts wounded; and the sometimes still greater hazard from excessive hæmorrhage, will be entirely avoided.

307. Should the irritating substance have found its way from the cavity of the rectum into that of the bladder, the most careful examination of the bowel should be made; and the state of the parts, and peculiar circumstances of the case, will readily suggest what is most expedient to be done for the removal of the cause, or relief of the consequences, of the accident.

308. Where symptoms of irritable bladder proceed from cold, the common remedies for slight feverish indisposition, assisted by rest and quietude, will soon remove the attack. When these symptoms proceed from a tendency to gravel, the treatment must depend entirely upon the peculiar diathesis, as explained in the section upon that subject.

309. Cases of chronic inflammation partially affecting the mucous membrane of the bladder, are productive of so much variety in their attendant symptoms, and require so much consequent variation in the principle of treatment, that it becomes extremely difficult to lay down any general rule for their management. The instances of this kind of affection given (Cases 27. and 28.), will perhaps, considered with attention, afford more instruction than any comment that might be added here.

310. In irritable states of bladder, with excessive excitability of the generative organs, consequent upon habits of preternatural irritation of the

parts, the single principle is to restore tone to the constitution; and in proportion as general strength is raised, excess of local irritability will generally be diminished. The application of the means, however, must be of course adjusted with care, so as to meet the peculiar circumstances of each particular case; and the use of bark, steel, and the cold bath, the observance of a plain unstimulating yet nutritious diet, with habits of early rising and regular exercise, will all go into the general account; although in almost every instance will each of these means require to be variously adapted and applied, in order that they may conduce most effectually to eventual recovery.

311. The constant distress and wearisome irritation frequently attendant on these complaints are only equalled by the great obscurity that occasionally conceals certain features of their history. It seems peculiarly unfortunate, and not easily explicable, that a merely sympathetic irritation in the urethra, should not only deceive a very intelligent professional patient into the conviction of his having strictures, but that this conviction should have equally fettered the decision of every one of many medical friends; and should have even led to the application of caustic. It may, however, convey a most useful precept, in serving to show the importance of coming to the consideration of every case unbiassed by any opinion whatever, either of the patient, or his previous attendants; for it cannot be supposed that such an error could have so long remained undetected, as happened in one particular instance (Case 29.), had each of the surgeons who passed bougies taken the trouble to judge for himself.

312. Irritable bladder from diseased prostate gland will usually give way to those means conducive to the relief of the primary affection. Local depletion, by leeches to the perineum, or cupping-glasses to the loins; occasional immersion in the warm bath;

constant attention to the bowels; and in certain cases the preventing over-distention of bladder, by wearing an elastic catheter; all these means may prove highly beneficial. In particular cases, however, all these means fail, and peculiar symptoms require other modes of alleviation, such as may be afforded by opiates, the preparations of conium, hyoscyamus, and other sedative and antispasmodic medicines.

313. Where irritation in the bladder is produced by disease in the rectum, uterus, or other neighbouring parts, the object is first to ascertain as precisely and perfectly as possible, the seat, extent, and habits, of the primary disease; and then to proceed to such treatment as it may require; for when the primary affection gives way, symptoms induced by sympathy most frequently decline spontaneously. Should such irritation, however, terminate in ulceration (295.) the alleviation of pain and distress, seems to be all that can in general be expected, either from medicine or surgery. *

314. The urinary bladder, subject to occasional injury from external violence, has sometimes suffered from bruise; but wherever I have known such cases end unfortunately, it has almost always happened from early neglect, either in the patient, or his attendants. By timely attention to rest and quietude, repeated local bleeding while pain remains, constant regard to gentle laxity of bowels, the direction of proper medicines, and a restricted diet, those ill consequences may be averted, which under neglect, might be reasonably apprehended.

315. Where irritation is the consequence of ulceration of the inner membrane, or where it depends on fungoid or cancerous disease of the coats, of the bladder, it is extremely doubtful whether any means are capable of affording relief, beyond the mere alleviation of present distress; which alleviation

* See PLATE II. *Fig. 2.*

may generally be obtained by the administration of anodyne remedies, and in extreme pain perhaps the application of leeches; added to the other ordinary means for preserving or restoring a kind of balance, among the healthy functions.

CASE 26.

Irritable Bladder, with Partial Retention; from Cold.

A MARRIED man, aged 40, sent for me on the evening of Dec. 19. 1820, having had considerable pain and difficulty in passing his water, since the preceding day; after sleeping quietly through the night, he had been disturbed every half hour all day; with much pain and urging towards the close of the act, when a little blood was expelled. There was decided tenderness, on pressure, above the pubes. He stated that he knew of no cause for this, unless it was a cold he had felt some days about his body and limbs. The pulse and tongue unaffected, I directed an aperient, night and morning.

Dec. 22. One day, the bowels being neglected, the symptoms increased. At this time, however, the body being open, he felt much better. The tenderness on pressure was gone, and the frequency and pain in voiding urine much diminished. The turbid urine deposited a reddish-white cloud, several minute coagula of blood subsiding to the bottom. The aperient medicine was continued, and he was enjoined to remain quiet in bed, drinking occasionally of some mucilaginous decoction.

Dec. 23. Instead of being up, as on the night preceding, six or seven times to pass his water, he had slept soundly till morning, and to-day passed it more freely and less frequently; the sediment much diminished.

Dec. 24. The tenderness, pain, and frequent desire to void urine, returned from taking a fresh cold, when suddenly obliged to leave his bed. He now also felt frequent pains darting along the

urethra in passing his water; and complained of increased pains about the loins and thighs. The pulse, tongue, and skin natural, I desired him a saline and ætherial mixture, at short intervals; repeating the aperient medicine occasionally.

Dec. 26. The bowels relaxed, and symptoms relieved. The tenderness about the bladder nearly gone; and scarcely any remaining uneasiness in passing the water. The urine clear, was passed three times to-day, and twice during the night.

Dec. 30. A purulent discharge from the urethra now made its appearance, with total relief to what remained of the other symptoms. This discharge, after continuing for a fortnight, subsided spontaneously, leaving him in every respect perfectly and permanently recovered.

CASE 27.

Peculiar Symptoms from Partial Irritability of the Bladder.

Dec. 11. 1820. I was consulted by a general officer in the army, aged 60, for a peculiar and painful uneasiness about the root of the penis, which came on suddenly, and generally urged him to pass his water, although doing so did not relieve him. It first commenced two years before at Brighton, where, without advice, he in six weeks rubbed in nearly a pound of mercurial ointment; which neither affected his mouth, nor relieved his complaint.

Returning to town, a surgeon directed blue pill occasionally for four months, when the symptoms unabated, he discontinued his attendance.

It appeared that the power of retention was generally good; he frequently passed one or two pints of water at a time, without previous or subsequent uneasiness. The bowels were habitually regular and relaxed, but when their contents were solid, no uneasiness was excited. The complaint, a combined sense of heat and of pain, was generally seated

in the root of the penis, now and then passing backward to the anus; in this latter part, however, he never had any swelling, or other complaint, in his life. A venereal disorder he once had, fifteen years back; said he had thought the present symptoms were of that kind, adding that he certainly had felt less than usual from them, during the use of mercury. He had, however, been assured this was not the case; which opinion was perfectly in unison with my own conviction. I directed him a medicine, containing opium and æther.

Dec. 20. The above medicine had procured some temporary relief. The pain was now described as sometimes beginning in the glans penis, passing thence backwards, in the course of five minutes, to the anus; without seeming to stop or settle at the point where it originated. The urine still passed with its accustomed freedom, although sometimes the pain brought on so sudden a desire to empty the bladder, that he declined going into company; yet if obliged to resist the desire, it would sometimes go off without being attended to. I this day directed him an anodyne combined with a light tonic.

It appeared to me from the first, that permanent relief might very probably be obtained in this case by inserting a small issue in the neighbourhood, a suggestion which required some little consideration. I had intended to mention and strongly recommend this measure, upon his next visit; but I believe he soon left town, as I had not the pleasure of seeing him again.

CASE 28.

Irritable Bladder, with Partial Retention, and Supposed Ulceration.

August 18. 1820. I was consulted on behalf of a gentleman, aged 30, residing at Preston, in Lancashire. In *September 1819*, he became troubled

with frequent desire to make water, preceded by pain in the urethra, which pain continued after as well as during the time of his voiding it. These symptoms increased for some weeks, when he was relieved upon the discharge of a thin portion of coagulable lymph. He remained easy for several weeks, and then the same symptoms returned with greater violence, continued some weeks, and were suddenly relieved as before, by the discharge of a solid but thin portion of lymph from the urethra, of the diameter of a large pea. He continued well for a month, when the pain returned more severe than ever, with a sense of smarting in the glans penis. This torture was relieved by passing a third portion of concreted lymph, larger than either of the former. After this discharge, the pain never returned to the same degree as before, although it had continued, more or less, ever since.

The urine rendered in the first attack contained many small portions of lymph floating in it, which, by standing, settled into a white mucous sediment. Latterly the urine had become more clear, depositing little or nothing; though occasionally it was milky, with a sediment appearing like gruel. The urine never contained blood, or gritty matter.

In *Jan.* 1820, the bladder, moderately full of urine, was sounded, but no stone found. The operation had not been repeated, as it caused long continued pain and irritation, with constant desire to pass water. Except for the first two or three weeks of the complaint, there never had been any stoppage or retention of urine; and in *August* 1820, he could render it freely in any position. Latterly the power of retention had improved; he could now retain a pint of urine, although formerly obliged to void it by table-spoonfuls.

The pain, at first most severe in the glans penis, had latterly become fixed at the neck of the bladder, now and then extending to the bulb of the urethra. This pain most commonly came on about

noon daily, and generally continued till five P. M. ; obliging him to lay down, or sit quite still, as the least motion caused great additional pain and irritation.

As to the local state, pressure above the pubes gave no pain ; and the bladder, examined by the rectum, felt healthy, although it was conceived the prostate was somewhat enlarged, and rather tender. The passage of a confined motion always excited uneasiness at that part ; and a similar uneasiness was also felt during excessive relaxation of the bowels.

No satisfactory cause could be assigned for these complaints. About ten years before he had concluded that the urinary organs were in a weak state, having frequent solicitude to make water ; which continued two or three years. But for several years prior to the present attack, he retained his water very well. He never had any venereal affection, but had been much subject to copious emissions during sleep.

Various remedies had been directed, with various and but temporary success. The principal of these were opium, in glyster and suppository ; uva ursi ; magnesia ; soda ; copaiba ; blue pill ; and locally, leeches and fomentations. Of these the opiate glysters always gave relief to the daily returning pains.

As he had requested several opinions, one surgeon decided it to be an ulcer in the bladder, and that the coagulated albumen was the coating of the sore, directing him medicines, and enjoining him to wear an elastic gum catheter in the bladder, to prevent distention ; while another observed that this, like other affections of these parts, was dependent on disorder of the digestive organs alone, recommending that he should regard weight and measure in eating and drinking, and never do both at the same time.

My own opinion was, that irritation existing at

the neck of the bladder, had gone on to produce a circumscribed spot of inflammation, possibly ulceration; I thought the first the most probable state, having in many examinations of such diseases found the inflamed mucous membrane of the bladder throwing off patches of coagulable lymph; whereas the same membrane ulcerated, had always excreted, as far as I had seen, pus alone. The appearances noticed in the urine were exactly similar to those I had frequently observed in irritable bladder; from which in several instances of a strongly marked character, the patient had eventually recovered.

As to treatment, I advised the bladder should never be allowed to become painfully distended, a rule easily followed, where the power of expulsion remains unimpaired; in which state I conceived the introduction of any instrument to draw off the urine would only be a needless, and therefore injudicious interference with the natural offices of the parts. In the way of medicine, I thought the occasional use of opiates, and ætherials, likely to be useful; suggesting that if the complaint was not soon relieved, a trial should be made of the oxymuriate of mercury, or the oxyde of arsenic, exhibited in decoction of sarsaparilla; very cautiously administered, so as to give the remedy a fair trial, without exposing the constitution to the risk of inconvenience. The latter of these two active medicines I rather felt disposed to select, from the irritation having manifested a tendency to regular periodic return. I also mentioned the trial of an issue, inserted above the pubes.

August 20. 1821. This gentleman visited me, from Lancashire. He stated that at the time he desired my opinion upon his case he had also obtained that of Dr. BAILLIE, which he now laid before me. The Doctor had conceived that chronic inflammation of a part of the inner membrane of the urinary bladder existed, near its neck, in which a

part of the prostate gland was included. Regarding treatment, the occasional application of leeches, the continued use of opiates, and a course of decoction of sarsaparilla with extract of conium, were recommended, in the trust that the complaint would ultimately subside, although the progress of the amendment might be very slow.

On my enquiring the progress of the symptoms for the last twelve months, he observed that the pain had now left the urethra, and was but seldom felt in the bladder, unless he either took cold, or attempted to write much. It had latterly settled itself into the higher part of the anus, where it had increased so much that he could seldom sit longer than a few minutes without experiencing such a hot burning pain as obliged him to get upon his legs, and make water, before he could obtain any relief. A few months before coming up to town, the physician in attendance had examined him, and thought the prostate gland was still tender, and that there was a disposition to excessive contraction in the sphincter, from irritation. Directed to use a rectum bougie, he tried it, and believed it had been of use, enabling him to void his stools more freely. With relation to his medical conduct, he admitted that he had given neither of the plans submitted to him a fair trial, having done little more than continue his opiate injections, sometimes to the extent of six or eight grains of solid opium in the day.

In examining the rectum I found the prostate gland tender to the touch, but not enlarged; neither did the lower part of the bowel appear to be in any way diseased. On further examination there was discovered, between five and six inches above the sphincter, a contraction, the precise circumstances of which were not exactly determined. It was probably, at least in part, of a spasmodic nature. The pain and irritation produced in the examination, he remarked, were the

same exactly with those to which he was at other times subject.

For the regulation of his future treatment, the opinion of Dr. HOOPER was requested, in consultation. The result of which was, that in the first place he should take medicines containing the lighter preparations of steel, continuing occasionally the opiate injection, but only to the extent of two grains daily ; and that in the second place, he had better avoid having recourse to any instruments, the introduction of which, we both agreed, was likely to increase the irritable state of the bowel.

April 22. 1822. He wrote a letter, from which the following is an extract : — “ My water more clear, contains now little or none of the mucous settlement. I have not occasion to make it once, where I formerly passed it six times in the day, and when in bed I have not occasion to get up once where I used to get up three times. My strength is much improved, and general health better. I am still obliged to use as many glysters, two or three in the day, but not of more than one-fourth the strength I was used to when in London, there not being more than a grain and a half of opium in each ; all which I think very satisfactory. But I cannot help thinking a further improvement might still be made, if only a substitute for the glysters could be found, as I am now obliged, in consequence of having used them so long, to take them at regular times, whether in pain or not, otherwise I should get so low and languid as not to be able to move. What I want, therefore, is something that will bear me up, when I have not pain to warrant the opiate glyster ; which I think ought not to be used when there is no pain, for then it often brings the pain, and prevents my making water freely. Both Dr. HOOPER and Mr. HOWSHIP laid great stress upon chalybeates, I have therefore taken the steel medicine regularly. I think there cannot be a doubt that if I had a sub-

stitute for the glyster when free from the pain, I should be much better. But I am obliged to take them at the regular times, although I have no pain at all, and probably nine times out of ten it occasions the very pains it was intended to prevent, as it often gets up into the higher bowel, and appears to contract the bladder, so as to give me great uneasiness, and cause my water to come away by drops, attended with much pain. The glysters also occasion a good deal of heat in the seat, or rectum, so that towards evening, when I have had my second or third injection, I cannot sit down five minutes without being in the greatest distress and misery; and it is only after I have been in bed two or three hours, and the effects of the glyster are gone off, that my water begins to flow freely again. My bowels have been so regular this last winter as to make me think there is no remaining contraction in the rectum."

May 27. I had the pleasure of seeing his brother, who presented me with a statement from which I found the directions I had given, in answer to his former letter, had been attended to, and had answered the purpose; for without his knowledge a confidential person had, week after week, very gradually lessened the quantity of opium in his injections, till at last he came to use, in fact, none at all. He then soon discovered the change; somewhat subject to a trifling degree of occasional pain in the bladder, he found he had borne the privation much better than he could have believed possible.

CASE 29.

Irritable Bladder, and Urethra; with Supposed Stricture.

April 20. 1821. I was consulted by a young gentleman, who had lately graduated in the University of Edinburgh. His complaints were a perpetual source of distress. From early youth, of irritable habit, he had been subject to frequent noc-

turnal emissions, occasional sharp pain in the glans penis, and acrimony of urine; these circumstances he sometimes attributed to close study, at other times to bad digestion. Frequently he felt dull aching pain in the perineum, after some months extending itself by degrees to the bladder. He thought the bladder easiest when empty, but scarcely uneasy when it contained a pint of urine; he never had occasion to pass it, during the night. Female society produced a painful sense of fulness and distention in the parts. The urethra and bladder had been repeatedly examined by elastic bougies, and by the sound. These examinations had always aggravated his sufferings. In conclusion, he had been much in the habit of taking opium, as it had afforded him a certain degree of relief. I requested him gradually to diminish his usual dose of opium; and directed some mild aperient medicines.

April 28. Extreme uneasiness, and a most distressing sense of fulness in the perineum, had induced him to apply leeches, affording partial and transitory relief. He had been recommended warm baths, but as they uniformly made him worse, he laid them aside.

In the beginning of *May* he left town for the west of England; where at my request he bathed several times in the sea, and took the muriated tincture of iron. He wrote to me on the 15th, stating what he had done, and adding that his distresses were rather increased than diminished; that he found himself much weakened by the harassing nature of his complaints. After bathing he experienced the glow of reaction, but felt nevertheless an absolute increase of pain in the bladder, and discomfort during the day. After expelling urine, he still felt the pungent stinging pain, almost spasmodic, in the glans; with increased aching in the perineum. The urine had long contained small filamentous appearances, and now ex-

hibited these appearances more evidently. The functions of the stomach were badly performed, and the steel not agreeing well, he had laid it aside, substituting the bark. He particularly entreated to know, if I thought his complaints could depend on calculus. In my reply, I assured him I had no idea of any disposition to stone; but that I believed his complaints arose from a partial congestion of the vessels upon the inner membrane of the neck of the bladder, and prostate gland, in connection with an irritable state of the seminal ducts, opening into the prostatal part of the urethra, and nothing more; and that I would recommend him to lay aside sea bathing, but to continue taking the bark.

Oct. 31. He wrote, expressing much regret at not having continued the means directed, he said he had tried fifty plans, and adhered to none; adding that he had been punished for his unsteadiness. The urethra was now so extremely irritable, he felt sorry I had not thought it right to pass a bougie for him when in London; an operation which now he said was scarcely practicable. A diminished stream of urine, a diffused pain in the bladder, the old pain at the glans, frequent emissions, general debility, and impaired digestion, formed his present list of complaints.

The concluding part of his letter, however, was the most important, in which he said, "caustic has been proposed, and has been once applied, near the bulb, the other two strictures being passed more readily; but as yet without mitigating the symptoms. I am in doubt whether to have it employed again, or any other application." To this I replied, that I should unquestionably advise him to come up to town, before any thing more was done.

Nov. 14. He reached London, and to satisfy his mind, I at once passed a fair-sized bougie with perfect ease into the bladder. I carefully examined

the bladder from the rectum, by the finger, ascertaining the condition of the more remote parts of the bowel by other instruments; without discovering disease, contraction, or irritation. The prostate gland and bladder felt very healthy; and the intestine for eleven and a half inches of its extent, was perfectly sound. He could scarcely, however, believe the urethra free from stricture, and was therefore particularly desired not to leave town without another opinion, to which he assented. I therefore met the late Mr. WILSON in consultation, who passed a full-sized silver sound at once into the bladder. It satisfied him, and he now declared with amazement, that more than twenty surgeons, at Bath, Bristol, Clifton, and elsewhere, had passed bougies for him, without one being able to get beyond the bulb; while most of them agreed there were three strictures.

The derangement in the association of the natural functions of the generative organs, was regarded by Mr. WILSON, as it had previously been by myself, as the true cause of all his complaints. He consequently gave him the same opinion he had before received, which was to avoid risk, and obtain comfort and security, by determining to marry early; regarding such change in circumstances, as a measure most likely to bring the functions and feelings of the system progressively round to their natural and healthy state; assisted occasionally by tonic medicines.

CASE 30.

Irritability from Venous Congestion at the Neck of the Bladder: with Renal Calculi.

December 1815. I visited a young gentleman, aged 15. His complaints were frequent, dull, aching pains, supposed in the chest. These were apparently seated in the muscles covering the ribs; an idea strengthened by the decided tenderness, and

soreness on pressure. Similar pains were occasionally felt in the muscular parietes of the abdomen. In addition to these complaints, I was soon informed of others, illustrative of the true nature of the disorder. He had just returned from school, where led into habits most destructive to all future health and happiness, he had for years been rendered subject to frequent nocturnal emissions; and although, upon the consequences of such habits being pointed out, he steadily desisted from any voluntary aggravation of them, his complaints continued to go on, in spite of abstinence, medicine, and the shower-bath.

In the spring of 1816, the pains about the chest and abdomen were so far relieved as to enable him to leave town, for the university; where his health again declined, and in *August*, at the request of his father, I paid him a visit at Oxford. He still lived cautiously, and abstinently, and drank only water; but the old pains about the chest and belly had increased, with sickness at stomach, tenderness and pain in the testes, frequent emissions, and severe pains at the loins. In consultation with a physician, medicines were again directed, but with little effect. The cold bath was also recommended, and this, when he steadily continued it, appeared to be more useful than any medicine.

In 1818, added to his other complaints, he became subject to pains of a new kind, at the loins, with deposit of mucous matter in the urine; together with a most distressing sense of weight in the perineum, and about the bladder. He was requested to continue the use of the cold bath, and also to attend particularly to the regulation of his bowels.

In 1819, he contracted gonorrhœa, from which, under the usual treatment, he recovered. In *July* he wrote, saying, that soon after the discharge had stopped, he had felt an uneasiness in passing water,

which made him suspect stricture was forming. The tenderness about the abdomen still existed.

March 22. 1820. He wrote up to acquaint me that he had just been seized with a violent pain in the loins, which soon went off, but the same day returned with such violence, that he was visited by a medical gentleman of Oxford, who directed an opiate, considering it an attack of gravel. The following day it returned more slightly, after which, in making water, he felt a sharp twitch in the urethra, and in the urine found two small calculi of uric acid, the largest less than a coriander seed. He was directed the carbonate of soda.

April 16. He reported that he had regularly continued with the soda, and had suffered a return of pain in the side, not as before transient and severe, but permanent and slight. During this pain, he observed two or three small crystals in the urine, which contained more of a brick dust-coloured sediment, with uric sand, than before. He was directed to continue the soda, but in larger quantity.

In the course of the summer, he visited town for a short time; and although the urine was now clear and healthy in its appearance, the stream was diminished, and there was an irritation in the urethra, with frequent desire to empty the bladder. I passed a bougie of moderate size, and found a spasmodic contraction at the bulb, which was, however, readily passed.

November 1. He wrote to say that his old complaints still continued; added to which, he now felt a sharp pain at the close of passing his water, darting from the neck of the bladder along the urethra to the glans penis. He observed, that he had long thought, and was persuaded in his own mind, a stone was forming in the kidney.

February 8. 1821. While in London, he had a slight cough, and spit some blood from the lungs; for which complaint, he was visited by Dr. HOOPER;

this attack was very soon removed, but his health remained indifferent, the urine depositing constantly a large proportion of thick mucous sediment, and sometimes red sand.

April 6. The spitting of blood having returned, Dr. HOOPER was again requested to see him. There was no pain at the chest, but increasing oppression, and the hæmorrhage not giving way, a consultation was proposed, and Dr. BAILLIE was requested to visit him. The spitting, at first blood and mucus, soon became purulent, and with the symptoms usually attendant on consumption, he fell off, sunk, and on *July 1.* died.

Having so long felt much for the declining health of this interesting young gentleman, and having repeatedly experienced anxiety and doubt as to the principle on which such complaints might be treated with most advantage, I was induced to fulfil the painful duty requested of me, in superintending the examination of the body.

In the right cavity of the chest, the lungs partially adherent, were universally tuberculated. In the superior lobe, the tubercles had formed abscesses, many of which had burst into the trachea. Near the most diseased parts of the lungs, blood had escaped from the capillary arteries, producing patches of effusion under the surface of the pleura investing the lung. A similar appearance was observed beneath the apposed surface of the pleura covering the pericardium. Within the cavity of the pericardium, no such change had taken place.

In the abdomen, the kidneys were externally healthy. The cavity of the left kidney laid open, a thick white fluid, appearing like cream, was readily and repeatedly expressed from the ducts of several of the mamillæ. From which, it might be inferred that the deposit of thick sediment in the urine had been derived, in part, from this source, and was, therefore, a depraved secretion from the gland itself, and not from the mucous membrane lining its

cavities. A small calculus, of uric acid, was found arrested in the upper orifice of the ureter. It was of the diameter of a large pea, and of an irregular flattened figure. Where the stone was confined, the inner surface of the ureter was of a dark, and even livid colour, from increased vascularity; the cavities of the infundibula, also, were irritable and vascular. The right kidney was perfectly healthy.

The bladder, large, but not thickened, was removed. Upon the anterior surface, towards its neck, was the most numerous assemblage of enlarged and varicose veins I had ever seen, filled with very dark-coloured coagulated blood. The veins upon the posterior part of the neck of the bladder were in a similar state, several of them being of the diameter of a goose-quill.

Within the bladder was a small quantity of thick and turbid urine, resembling that found in the ureter, and cavities of the left kidney, and similar to that usually passed for many months. The prostate gland was sound, the openings of the seminal ducts into the urethra, and the general surface of that canal, were nearly free from any appearance of irritation; but the mucous membrane lining the bladder, particularly towards its neck, was crowded with small vessels, rather behind than upon the surface; which appearance, together with the unusual and extreme congestion in the enlarged veins encircling the neck of the bladder, fully explained the irksome and harassing sensations of aching pain, from which, for years, he had been never altogether free.

CASE 31.

Irritable Bladder, with Peculiar Symptoms; from Diseased Prostate Gland.

December 1816. My opinion was desired by a clergyman, aged 74, residing at Chichester; five years subject to a complaint attributed to flatulency in the lower part of the rectum, where wind

generated, with great pain about the neck of the bladder and perineum. These parts, with the scrotum and penis, when the spasm came on, were agonized with pain, and so tender as not to bear the slightest contact. But when he could discharge wind downwards, the pain and agony subsided, till the wind generated again, which it was constantly doing; and while the spasm lasted, it induced great distress, from urgent desire to pass water, with aching and bearing down pains about the loins. Sometimes he found the spasms principally affect the vessels and nerves in each groin, in the scrotum, and thence to the neck of the bladder; but whenever he obtained a large discharge of wind per anum, he could press the scrotum perineum and parts about the neck of the bladder, as hard as any other part of the body, without pain.

The urine sometimes deposited a glairy sediment, and as often a white mucous matter. The bowels were habitually confined.

Leeches to the perineum had bled very freely, to no purpose; and the warm hip-bath been long used, without the least benefit. The spasms being much worse during the night, he hoped to have found relief from opiates; but these had only operated by increasing the difficulty of discharging either urine or wind. Stimulating applications, and soothing fomentations, to the perineum, alike failed to alleviate his distress.

Upon these grounds, I recommended him constantly and carefully to attend to his bowels, by mild and gentle aperient draughts; and that he should occasionally try the effect of one grain of opium, with five of extract of hyoscyamus, in the form of suppository, passed into the rectum.

These means, in a few weeks, I had the pleasure to learn, had afforded him very great relief. Some time after this, Dr. BURNETT, of Chichester, was consulted; and upon my making some enquiries, in *May* 1822, this gentleman did me the favour to

acquaint me, "That when he attended the late Mr. — he suffered from stricture in the urethra, and diseased prostate gland; his symptoms, at that time, presenting nothing unusual. His complaints, though they could not be removed, were so far amended, as to allow him to return to his clerical duties, which he continued to discharge till within a short time of his decease."

CASE 32.

Irritable Bladder, from Diseased Uterus.

A WOMAN, aged 37, after three years suffering from uterine pain, consequent upon a severe miscarriage, complained, in *November* 1819, of an uneasy sensation in the region of the bladder, with constant desire to pass water, which, with much bearing down, was generally voided in small quantity, and sometimes not at all. The urine lost its healthy characters, depositing a yellowish-coloured mucous sediment. She also became subject to pains in the loins, most urgent whenever the straining to pass water was most severe.

In the winter of 1820, by the advice of a neighbour, she tried, for two months, the effect of sitting six hours a-day over the steam of hot water, a practice that soon induced a prolapsus of the rectum, a complaint she never had before. Soon after she sat down, the bowel would protrude, without the least straining; for, as she expressed it, "the hot steam drew it down;" and so it usually remained till she left her seat, when it slowly returned. During this period, the bowel came down also, whenever she passed a stool. The best evidence, however, as to the cause, was this: that a few days after she laid aside the practice of sitting over steam, the protrusion ceased, and had never returned.

A few months after the commencement of irritation in the bladder, one night particularly dis-

tressed by the violence and severity of bearing down, she supposed she overstrained herself, for the next morning, she had lost the power of retention, and her urine had passed involuntarily ever since. About this time also, menstruation ceased, although she continued as before, to suffer constant pain in the uterine region.

Nov. 6. 1821. She was admitted into the Infirmary. The urine, at this time, contained a large proportion of a yellowish flocculent matter, attaching itself to the bottom of the vessel, and having a grassy appearance, exactly as sometimes occurs in irritable bladder, from stricture. On examining the bowel by the finger, I found it irritable, and formed into numerous relaxed folds. The state of the vagina could not be satisfactorily determined. It felt as if partially occupied by fleshy excrescences, yet it was spacious and relaxed; but I could not ascertain the position or existence of the os uteri. There was no tenderness about the abdomen; but the passing a motion induced a violence of straining equal to the severe pains of labour.

Nov. 13. Rather easier. The urine now deposited as much as a third part of pale yellowish or clay-coloured pulp, of very peculiar character; nearly as tenacious as birdlime, and containing here and there minute coagula of dark blood. As to medicine, a gentle anodyne was directed to be taken every night at bed-time.

Jan. 3. 1822. Remained much the same; and being desirous of going down into the country, she was at her own request discharged.

April 6. Readmitted. From taking a severe cold, she had lost the use of her limbs; her old complaints remaining much as they were. Medicines were directed, and her general health gradually improved.

April 25. Her most frequent distress was now an urgent desire to pass water, with a dreadful pain at the bottom of the stomach, in the seat of the

bladder. This attack generally lasted about a minute, during which she might strain, but could pass nothing; the pain over, the urine came away again as usual, so that she scarcely ever voided a spoonful at a time. Appetite and health tolerably good; and no pain whatever in the loins, groins, or thighs. Having business out, she was now again discharged.

CASE 33.

Irritable and Ulcerated Bladder, originating in a Bruise.

A POOR woman, a soldier's wife, aged 30, in Dec. 1820, passing a lane in the dark, fell over a large square stone, violently bruising the lower part of the abdomen. The immediate consequences, severe pains in the belly and loins, with fever, were neglected. As the catamenia were just subsiding at the time of the accident, flooding came on, and continued with scarcely an interval for near eight months. With constant pain in the region of the bladder, frequency in passing water, and general confinement of bowels, she was distressed by violent griping and forcing pains, distressing the whole contents of the pelvis.

Nine months after her fall, on her passage to Ireland, she mentioned her illness, and obtained some medicine, that relieved her bowels. She soon returned to England, and procured an admission into an hospital; her complaints no better. She was, under the physicians' care, directed various medicines, and in about three months the flooding ceased, but the tenderness and pains in the abdomen and bladder remained; and she now suddenly lost the power of retaining her water. Some weeks after this event, a sound was passed and the bladder examined, but no stone found, nor any information gained; but she felt much exhausted by the operation. By medicines her feverish symptoms were somewhat relieved, and by the administration of soothing anodyne injections she was

enabled sometimes to enjoy comparative ease from the pains in the loins and about the hips.

Nov. 28. 1821. She was admitted into the Infirmary. The abdomen was at this time painful and tender; but the pulse and tongue in a fair and natural state. Some aperient medicines were first directed.

Dec. 4. Added to other symptoms, she had a continual pale-coloured discharge of thin fluid from the vagina; and on examination it appeared that the uterus, as well as bladder, was diseased. A blister to the abdomen, and saline medicines, were directed.

Dec. 11. The bowels disordered, and relaxed; I proposed examining the state of the rectum, but recollecting what she had suffered in the examination of the bladder, she declined. On the 16th, however, she became very desirous of having this enquiry made; and a silver ball was therefore passed without obstruction to six inches, where a contraction was felt, which, however, was attributed to spasm. Under the direction of the apothecary she took the chalk mixture, with opium. Her medicines at first checked the diarrhoea, but it subsequently returned in greater violence; so that notwithstanding medical aid she sunk and died, *Jan. 5. 1822.*

In the abdomen I found a small quantity of purulent fluid, and a larger of effused lymph, connecting several folds of small intestine to the space between the bladder and uterus. The bladder was contracted and empty, and in its general structure healthy. The uterus not enlarged, was nevertheless diseased. The posterior part of the bladder, adherent to the cervix uteri, was with it involved in one general ulcerated cavity, which had destroyed the posterior and inferior part of the bladder, together with two-thirds of the substance of the uterus. This ulceration had left the external part of the urethra detached from what remained within of the bladder; the circumference of the ulcerated part of

the bladder was thickened, and the appearance of the inner membrane round the margin, that of irritation. The uterine appendages were extensively consolidated by inflammation, and in parts contained pus, in the interstices of the cellular texture. The mucous membrane of the rectum, for the lower eight or nine inches, was very vascular, and its coats thicker and more firm than natural; but there was no ulceration, nor any degree of permanent stricture.

As to the origin of this disease, it appears to me that the blow received in the first instance, most probably struck the posterior surface of a full bladder violently against the spine, just as happened in another instance (Case 46.); in the present case, however, falling short of laceration of its coats, although through inflammation the mischief went on to ulceration; extending to the uterine system, and thus proceeding on to its eventually fatal termination.

CASE 34.

Irritable Bladder, from Disease in its Coats.

Aug. 24. 1819. I was requested to visit a female, aged 79, who had long felt uneasiness about the bladder, and now complained of constant desire to pass water; which was rather a turbid purulent fluid than urine. It was voided in the smallest quantities, and sometimes streaked with blood. There was no pain or uneasiness, except in the seat of the bladder, and particularly towards the urethra. This complaint had for the last two months advanced imperceptibly, but now allowed neither sleep nor ease. Sometimes she had difficulty in voiding the urine, accompanied with darting and cutting pains in the part. The bowels were habitually regular. Examined by the vagina, the os uteri was found in its healthy state; and by the rectum, the bowel felt natural, but in pressing the finger forward, the parts appearing thicker than

common, she was instantly thrown into great agitation, saying she now felt the same pain as in making water, only not so severe in degree.

It was clear enough, that there was some disease in the bladder, for the temporary relief of which I directed the parts to be kept cool by the occasional use of a saturnine lotion; prescribing also an anodyne draught; and a starch injection containing thirty drops of tincture of opium, to be repeated night and morning.

Aug. 25. Somewhat easier, but declining fast. On the morning following she had less pain, in the afternoon was much lower, and in the course of the following night she died.

I fortunately obtained leave to examine the body, and found the bladder somewhat thickened, feeling as if moderately distended with a pulpy matter. Removed and opened, a little thick bloody urine, irregular masses of a sabulous deposit of the phosphates, and a considerable quantity of pulpy brain-like matter, were within its cavity. This pulpy substance in some parts was decomposed and putrid, in others of a cream colour, more firm texture, and evidently vascular. At some points, particularly towards the origin of the urethra, were irritable red spots upon the inner membrane; one of these had a patch of adherent sabulous matter upon its centre.

In doubt how the disease originated, and carefully turning a part of the mass out of the cavity, I found several pulpy tumors, exactly resembling the appearance of the fungus hæmatodes. One, the diameter of a five-shilling piece, lay on the left side, towards the posterior part of the bladder. This tumor, formed between the muscular and mucous coats of the bladder, had protruded inwards, rendering the inner membrane covering the lateral parts thin and fine; towards the centre the whole structure, surface, and substance, had given way, and was in a state of partial decomposition, mingled with the other

contents of the cavity, leaving a pulpy, ragged, projecting basis, with here and there an appearance of small arteries upon the whitish-coloured broken surface.

There were several other tumors, less advanced in growth, but of similar texture, upon different parts of the surface of the cavity. This disease is deposited in Mr. HEAVISIDE'S Museum.

It appeared probable that the above disease had originated in a neglected attack of inflammation of the bladder, for among the pulpy and sabulous contents were found numerous detached and adherent patches (some rather thick and large) of effused coagulable lymph; which upon the subsiding of the increased action into its chronic stage, had by degrees mingled with the imperfectly organized and decomposing mass of the disease.

The only other morbid appearance observed was in the gall bladder; which was contracted round, and closely adherent to, a number of small biliary calculi, angular and packed so as to present a uniform external surface. The stratum of lymph interposed between the surface of the gall bladder and that of the calculi, was extremely thin, and appeared to be converted into a fine cellular membranous structure.

CASE 35.

*Irritable Bladder, with Cancerous Disease.**

December 15. 1796. I was desired to see a gentleman, who it was suspected had stone in the bladder. On enquiry he said he had always been a regular, temperate, and healthy man. For the last two years his health had declined, which he principally attributed to anxiety of mind, connected with affairs of business. For the last two or three

* Extracted from a MS. in Mr. HEAVISIDE'S Museum, where the diseased parts are preserved.

months he had found difficulty and pain in making water, and twice in that period had had retention of urine, which was relieved by medicine.

His present complaints were frequent inclination and straining to make water, the act being followed by a discharge of viscid mucus, sometimes streaked with blood, and constant uneasiness, with irritation at the neck of the bladder. I told him it was difficult to say positively what the nature of the disease might be, unless he allowed me to examine his urethra and bladder. He readily consented, and I passed a middle-sized bougie into the bladder, but not easily, having met with two or three obstructions in the way. I then introduced a sound into the bladder, and endeavoured to ascertain whether there was a stone; but the sound felt so firmly wedged in, that it would neither move one way nor another. It was therefore withdrawn, and a considerable bleeding followed. Dr. CRICHTON and Mr. LUCAS were present at the examination, and we were all of opinion there was disease of the bladder, but of what kind it was not easy to say. Several days after this, I found him rather worse, passing water every hour, with great straining, and a copious discharge of a glairy and bloody mucus. Added to all this misery, he had a teasing diarrhoea, with prolapsus ani; little strength, and less appetite.

Still entertaining an idea that stricture had a considerable share in his complaints, I passed a full-sized bougie, which stopped at three and a half inches. Convinced that whatever might be the nature of the disease in his bladder, no benefit could arise till this obstruction was removed, I proposed to touch it with the lunar caustic; to this he was somewhat averse, fearing it might bring on more irritation, but I assured him it was more likely to diminish it. He therefore submitted, and *December 25.* the caustic was applied, only exciting a sense of local heat for about half an hour. In consultation it was agreed to continue this plan.

When the caustic had been applied seven or eight times, a full-sized bougie passed to the bulb of the urethra. I would have persevered with the caustic, but from the sleepless nights, and perpetual calls to make water, added to his other ills, harassed and worn out, he begged it might be laid aside.

He continued in this deplorable state, or rather getting worse, for three weeks, when he died, emaciated to the greatest possible degree.

All the viscera were sound, except the bladder, which was completely diseased, and in many points disorganised. The peritoneal covering was entire, but this being divided, the remaining coats of the bladder were in some places perfectly destroyed, and in others converted into a loose membranous, fungous, or cancerous structure. Towards the fundus, the muscular coat, as well as the inner membrane, was entire; the healthy mucous secretion, however, had apparently been deficient, several parts of the inner surface of the bladder being crusted over with sabulous and sandy matter.

The ureters, much distended with urine, were very thin.

CASE 36.

Irritation, from Fungus Hæmatodes of the Bladder.

A WOMAN, aged 57, applied for assistance in August, 1813; the following is the outline of her case. In 1805 the catamenia ceased, and for seven years afterward she enjoyed good health. About this time she felt a smarting uneasiness in making water, which in six months excited severe straining, and frequently when the bearing down was severe, blood passed with the urine. For this new symptom she took medicine, which, to use her own words, only "seemed to bring down more blood than before." Thus her complaints increased. For the last three months she had been greatly distressed by wandering pains about the loins, and these lat-

terly became fixed and settled in the hips. Irritation to pass water now constant, the efforts, violently urgent, were renewed every ten minutes. Position made no difference; it continued equally night and day. When the pains were most violent, she always passed more or less pure blood with her water.

At the persuasion of a female friend, she tried the effect of sitting over the steam of warm water. This she at first fancied gave relief, but eventually found only to increase the hæmorrhage, it was given up.

An examination, per vaginam, afforded no clue, every part appearing to be in its natural state.

She considered her complaints rheumatic, and therefore procured a blister, which was laid upon the loins. On the blister taking effect, she first felt and mentioned a swelling in the lower part of the belly. Upon my examining the parts the following day, a considerable firm tumor, fixed to the bones, was evidently felt in the seat of the bladder, just above the pubes.

From the preceding hæmorrhages from the bladder, and from the feel of the tumor, it was thought possible it might be a mass of coagulated blood filling up the bladder, added to which, the external feel resembled that of a case in which Mr. HEAVISIDE found the bladder full of blood. (81.)

The poor woman fancied the pain in the back somewhat relieved by the blister, but not that in the bladder. The pains were exceeding violent, but had never the peculiar darting or burning feel generally characteristic of cancer. Pulse, small and weak, 120. The pains now, and from the first, were most constant and severe in the left side of the loins.

August 17. Great pain and distress, watchfulness, and fever. The tumor stationary. The grumous, bloody, or brown appearance of the urine, which for a few days ceased, now returned, with

an occasional formation of a small thin coagulum of blood at the bottom of the vessel, or the occasional escape of small coagula, formed in the bladder. The turpentine had been directed to check the bleeding, but in vain; she was now ordered ætherials and opiates. On the following day she died.

The tumor within the abdomen was manifest to the eye. Upon laying open the cavity a large, firm, elastic mass was found projected upwards from the pelvis, firmly adherent to the anterior bones. The small intestines, partially inflamed, were in various points adherent to the tumor.

From each side of the tumor in the pelvis, an extensive chain of enlarged lymphatic glands passed upwards upon the loins, to the root of the mesentery. The diseased glands were much more enlarged on the left, than the right side. Many of these glands were equal in size to a hen's egg. As it was impossible to ascertain clearly what the principal tumor was, without removal, it was dissected out, and the urethra was then found to pass into it. Following the cavity of the bladder by the probe, a section was carried through from the urethra, along the anterior part to the fundus vesicæ. This section included a considerable portion of the disease, which appeared to consist of a deposit of a soft, white, pulpy matter, into what appeared to have been originally the cellular texture connecting the coats of the bladder. The increasing pressure, from the progressive growth of the disease, had given the cellular membrane the appearance of fine ligamentous fasciculi passing in various directions, while the mode in which the albuminous matter had been deposited, the secretion having been principally carried forward at particular points, gave the whole mass the appearance of a congeries of tumors.

The quantity of disease formed, varied at different points. At the anterior part of the bladder the greatest thickness was one inch, but at the lateral and posterior parts I found it equal to two, and even three inches.

The disease was principally made up of the soft, white, pulpy matter, in some points resembling cream; although here and there a secretion of adipose substance assisted in completing the quantity. In many of the smaller tumors, minute extravasations of blood were found, upon dividing into their substance; in a few it was effused so near the surface as to be seen shining through the investing membrane. Some of these tumors had protruded into the cavity of the bladder, carrying the mucous membrane before them. Several parts of the mucous membrane so circumstanced, at the cervix of the bladder, were extremely vascular, and from these points of congestion, in the progress of disease, the blood had been poured out. This fact was proved by my finding small filamentous coagula, still connected with them; in the dissection.

The extravasation of blood into the substance of these tumors had taken place to a greater extent in the diseased lumbal glands, than in the tumors in the bladder; a circumstance, perhaps, explained by there having been an occasional, though, temporary relief to the congestion in the one situation, but not in the other. This disease, which is not of common occurrence, is put up in Mr. HEAVISIDE'S Museum.

PART II.

ON THE DISEASES THAT REGARD THE EXCRETION OF URINE.

CHAP. I.

ON INCONTINENCE OF URINE.

316. **I**NCONTINENCE of urine is a complaint principally occurring in early youth; although not unknown in later periods of life. Aged persons, subject to stricture, or to affection of prostate gland, are occasionally distressed by want of power to retain their urine, which, notwithstanding, is in these cases a symptom of a full bladder.

317. The involuntary discharge of urine during sleep has been variously accounted for, but it seems to me that a moment's consideration will clearly explain it. The general muscular coat of the cavity of the bladder may be regarded as an involuntary muscle; while, on the contrary, the circular band of muscular fibres surrounding its neck is, to a certain degree, obedient to volition. Now we know very well, that a state of repose relaxes very much the whole system of voluntary muscles, exerting little or no influence over the system of involuntary movements. Upon this principle, it is evident an involuntary flow of urine might more readily occur during sleep, than while awake. There is, however, I believe, another circumstance tending to explain how it happens. In the majority of cases, the early age of the child prevents the ascertaining whether the urine flows during a state of positive oblivion, or whether this event takes place only under some particular mental impression. The latter state, I rather believe, is mostly an invariable condition. Intimately ac-

quainted with a young person, in early youth long subject to this habit, he mentioned to me one circumstance, that upon these occasions, had often struck him as curious ; it was, that he never at any time wetted the bed, unless when engaged in a dream he felt the accustomed uneasiness from desire to make water, and fancy, immediately supplying what was wanting in time and place, the act of voiding it became in point of fact, as perfectly voluntary, as at any other time.

318. These circumstances have not, however, been considered in exactly this point of view, by the illustrious DESAULT ; who, in reference to incontinence of urine, during sleep, observes, "*la sensation qui met en jeu la contractilité de la vessie, et accompagne l'éjection des urines, est si foible, que cette fonction se fait sans un acte formel de la volonté, sans exciter même une impression assez vive pour interrompre le sommeil ;*" although the methods of cure proposed, could have derived their efficacy from no other source than a mental impression, which it may be fairly inferred, was in fact an impulse of terror, so deep and permanent, as to attend even the light excursions of fancy during sleep.

319. The modes of cure proposed by M. DESAULT may be estimated by the following specimen. "*La crainte les rend plus attentifs au besoin d'uriner, et fait qu'ils épient, en quelque sort, le premier aiguillon qui annonce ce besoin. C'est à cette manière d'agir, que l'on doit rapporter les guérisons qu'ont produit une foule de moyens plus effrayans les uns que les autres ; c'est ainsi qu'on a vu des enfans être pour toujours délivrés de cette incommodité, en leur faisant écraser des souris vivantes dans les mains, en les faisant assister au lit d'un mourant, &c.*"

320. Where this disorder occurs in the adult as a simple affection, it is generally either the consequence of some paralytic affection at the neck of

the bladder, or of some violent distention of the urethra.

321. Now and then, as observed in a preceding section, a calculus lodged in the neck of the bladder will induce an involuntary flow of urine; occasionally a fungous tumor, in a similar situation, has given rise to the same unpleasant symptom. Not unfrequently, this event follows the forcible distention of the urethra, especially in the female, from the expulsion or extraction of a large calculus. (Case 24.)

322. Incontinence of urine in the female, is sometimes induced by difficult labour. In a recent case of this kind in a young woman, who, at the request of the midwife was kindly visited by Dr. MERRIMAN, the labour was not considered such a one as should lead to ulceration or sloughing of the bladder; but as she had scarcely any power of retention, five weeks after delivery, I was requested to call upon her, examine her state, and consider whether any thing could be done for her relief. The orifice of the urethra I found irritable and red. I first passed the smooth blades of a light pair of polypus forceps (the blades of which were rather long) just so far into the urethra as to reach the bladder; and then very gently and slowly expanded the blades, by pressing my fingers by degrees between the handles. In two or three minutes I removed the forceps, and introduced my fore finger, perceiving in my progress a strong and tight thread, which surrounded the canal at one part, the rest of the urethra relaxing very freely. This narrow ligature at first prevented the easy introduction of the finger, till it probably ruptured, as I felt no more of it, and found more freedom in then examining the cavity of the bladder with the one finger, while I followed it by another, introduced per vaginam, without perceiving any trace of wound or ulceration. A few drops of blood followed the operation. Calling some days

after, I was agreeably surprised on finding that since the dilatation of the urethra, the urine previously almost always dropping away, but never passing in a full stream, she had now the power of retaining nearly as long as she pleased, and also of voiding in a free and large stream "as in health;" she soon entirely recovered.

323. Incontinence of urine, it is true, does not expose the patient to such serious consequences as are induced by retention; but it nevertheless subjects him to inconveniences extremely distressing to one who is still desirous to enjoy some of the comforts of society. The clothes, always moistened and wet with urine, acquiring at length so strong a smell, as to be offensive to himself, and particularly so to all around him.

324. Incontinence of urine, in young subjects, is generally very easily removed. All that is commonly required is, to stimulate to a certain degree, the neck of the bladder; and this is most conveniently accomplished by the application of a small blister to the loins, or if that fails, to the perineum, the blister being for some time kept open, and dressed occasionally with the *ung. lyttæ*. The object is to keep up a degree of irritation at the neck of the bladder, during a certain period, by which the parts are roused into action; and I believe this plan, simple as it is, will generally answer, at least, I have very frequently seen it succeed, but never known it fail.

325. Where this complaint occurs in the adult, induced by fatigue of the parts, from excessive debauchery, or perhaps, the consequence of a slight paralytic affection, I know of no better mode of treatment, than that just mentioned. A blister will here, however, sometimes fail, and when this is the case, the *tinct. lyttæ* may be given internally, so as to answer the same purpose.

326. Where so unpleasant a symptom attends calculous complaints, every thing possible should

be tried, to alleviate the distress it produces ; but in these complaints, even this alleviation must be attempted with great caution. Various contrivances for receiving the urine, and various instruments for compressing the urethra, have been suggested. The first, however, always become extremely unpleasant and offensive, as well as inconvenient; the second are sometimes capable of affording relief, provided the pressure is confined to the urethra, without hindering or restraining the circulation through the parts. Pressure upon the urethra, in most complaints of a calculous nature, must be considered a hazardous experiment; and the same objection may attach to the application of blisters. Stone or gravel induces a state of preternatural irritability in the neck of the bladder and urethra, very apt to be increased by irritating medicines, or aggravated by local pressure.

327. This complaint has been mentioned as the occasional consequence of excessive distention of the urethra; the only instance of incontinence of urine, that appears entitled to a place here, is one of this kind; and it derives its chief interest from the tenor of the precept it may convey, as to the disputed fact of there being still some few fashionable follies to be met with in the practice of surgery. Where extreme distention has been the consequence of the passage of a large urinary calculus, or the passing instruments of excessive dimensions, time and tonics are the principal means for effecting the recovery of the powers and functions of the parts.

CASE 37.

Incontinence of Urine, from using Large Bougies; for a Supposed Stricture.

Oct. 20. 1818. I was consulted by a gentleman for stricture. He stated, that two years since he was in town, under a surgeon of eminence in

London, who told him his complaint was stricture, and passed in succession different sized metallic bougies, for several weeks; and then directed him to take a set with him down to Scotland, and pass them occasionally for himself. He produced the instruments, and the largest size (full half an inch in diameter) astonished me; though he said he could pass it, and proposed my seeing him do so. This, however, I objected to, saying I believed what he said, that it would in general find an obstruction before it had gone far, and well it might, while the urethra had any feeling; that the only symptom of which he complained, a want of power of retention, would hardly subside while he used any instrument of that size; it being, in my judgment, not only unreasonable, but ridiculous, to think of passing such a bougie. In looking over his case of instruments, I selected the smallest of twelve, passed it as a full size into the bladder, without the least hindrance; and stated to him, it was very clear there was no stricture at present, but that he could not go a more ready way to work to produce either that, or some other mischief in the canal, than by forcing in an instrument so much beyond the natural power of the urethra to receive, as that he had just shown me. To this he replied by admitting that the introduction of the largest size had frequently brought on irritation about the prostate gland.

I advised that he should do nothing; considering it most probable that by discontinuing the use of instruments, the bladder would by degrees recover perfectly its power of retention.

CHAP. II.

ON RETENTION OF URINE.

328. **R**ETENTION of urine is that malady in which the course of the urine is arrested in some part of those passages by which it is destined to flow off. This definition naturally suggests as many species as there are particular cavities. Four kinds of retention may therefore be enumerated. The first having its seat in the ureter and pelvis of the kidney; the second in the bladder; the third in the urethra; and the fourth and last, in the prepuce. We shall confine the attention, under these divisions, to the immediate seat of obstruction, not adverting to subsequent effects of accumulation, for in this way retention of several species would be included under one head. For example, urine retained in the urethra, if the disease be of any long standing, gives rise to retention in the bladder, in the ureters, and eventually in the very substance of the kidneys.

SECT. I.

On Retention of Urine in the Ureters.

329. **T**HE course, considerable extent, and yielding structure of the ureters, give every reason to expect they must be very subject to obstruction or pressure, from changes taking place in the contents or solid texture of surrounding parts, as well as from a variety of causes originating within themselves; obstruction in the ureters however, by whatever cause brought on, induces one and the same effect, retention of urine. In some cases the obstruction may be confined to one ureter and kidney, while in others both may be equally affected; if under the latter circumstances the retention is nearly per-

fect, it will not be easy, and sometimes impossible to distinguish the case from one of suppression.

330. The general consequences of this complaint, in producing distention of the kidney, have been already noticed. (60.) M. DESAULT observes that in all these cases the tunics of the enlarged kidney become thickened and dense, and that the cellular texture surrounding the gland undergoes a similar change, becoming condensed. I have examined many specimens in which this remark appeared to be verified, but have also seen some instances in which the operation of the same causes had certainly produced the most opposite effects, reducing the whole kidney to a cluster of thin vesicles, of so delicate a texture as to be almost entirely transparent. Some further remarks upon similar changes from obstructed urethra will be made in a subsequent part of these observations. (646.)

331. The dissection of a child is mentioned by M. DESAULT, in which the kidneys suppurated, were filled with calculi, the ureters being much enlarged, and the right ureter contracted by an annular stricture about its middle, appearing somewhat like the valve of the pylorus. Above the obstructed part the ureter was most dilated.

332. In the Museum of the Royal College of Surgeons is one curious instance of stricture in the ureter, apparently from the external membrane upon one side of the canal becoming consolidated and contracted, drawing the canal together at that part, so as to throw the inner membrane across the way, in a fold; in another preparation in the same collection, a stricture appears to have been formed by a partial contraction of the inner membrane alone, drawing the fold across two-thirds the space of the enlarged ureter.

333. A young medical gentleman, ten years subject to very painful nephritic attacks, was at length destroyed by his disease. The principal general feature of his complaint having been a gnawing fixed

pain, in the left kidney, increased by pressure or motion of the trunk. The urine small in quantity, once or twice slightly bloody, but never purulent. Laxatives always relieved him. On examining the body, a large, flat, oblong tumor, full of fluid, occupied the whole lumbar region. Laid open, three pints of milky fluid escaped from the enlarged cells of a greatly distended kidney, the natural structure of which, except its thickened membranes, was nearly destroyed. A small calculus was found within the sac, which exactly fitted the orifice of the ureter.*

334. In another very interesting example of obstructed ureter, under the care of Dr. JOHNSON, the cause seems to have been the frequent application of cold and wet clothes to the abdomen, the ill effects of the complaint having been aggravated at one time by the pressure of the gravid uterus. The diseased kidney, forming an evident fluctuating tumor, was tender to the touch, and extremely painful on pressure. The urine was always either scanty and high coloured, or plentiful and white, like milk. Reduced by colliquative diarrhoea, she sunk and died. On opening the body, a very enlarged ureter, and an immense bag, the only remains of a kidney, distended to an unexampled magnitude, were found. Opening into the flaccid and almost empty bag, about three pints of milky fluid, similar to that which had flowed in large quantities by the urethra, a few days before death, were removed. The internal surface highly vascular, and thickly studded with a kind of mamillary or papillary bodies, from the size of a pin's head to that of a small pea, formed an immense cyst, which, previous to its subsidence, must have contained at least five or six quarts of fluid. It is to be regretted that circumstances did not permit the ureter to be examined with sufficient care to deter-

* Med. Chir. Review, December 1822.

mine the cause, although there can be no doubt of the fact of its occasional obstruction.*

335. A very singular instance of congenital obstruction, from impervious ureter, is related in the *Sepulchretum* of BONETUS, in which the cavity of the abdomen was distended by a large mass, the description of which leaves no room for doubt: "Nam venis magnis per superficiem sparsis præditus erat tumor, et in ejus parte superiore, aliquid rubicundi instar placentæ uterinæ apparebat. — Aperto tumore invenimus eum repletum fuisse copia seri ingenti; tandemque deprehendimus renem dextrum in ejusmodi molem excrevisse, et tumorem illum efformasse, qui tamen ren et a figura sua naturali, et a substantia plurimum discrepabat, cum crassissimæ membranæ erat admodum similis, ureter quoque dexter plane erat impervius."†

336. A case of apparently complete suppression of urine is related by Dr. CLARKE, in a patient long subject to gravel and stone. The symptoms were such as to indicate calculi in the ureters, and the treatment directed to relieve inflammation and abate excited action in the kidneys; but on the eighth day he died comatose. In the pelvis of the right kidney was found a considerable quantity of gravel, the right ureter near the middle obstructed by a stone the size of a horse-bean. The portion between this part and the kidney was almost entirely filled up with sand. The left kidney appeared inflamed, and gangrenous; in its pelvis was some gravel, and a stone the size of an almond. The left ureter about the middle was distended by a calculus, the size of the last phalanx of the little finger; above this obstruction the ureter contained a small quantity of serous fluid, and in the pelvis of each kidney a spoonful of a similar fluid was found, without the least urinous smell. The blad-

* *Med. Chir. Journal*, July 1816. † *Lib. iii. Sect. 17.*

der empty and sound, contained a stone, weighing three drachms.*

337. The largest calculus I ever found in the ureter I met with very lately, in examining the body of an officer of high rank in the navy, all his life subject to irritation at the neck of the bladder. Several years before death he had a severe nephritic attack in the left kidney, since which time his physician, Dr. HOOPER, had considered that he laboured most probably under a purulent affection of kidney, to which severe sympathetic pains, lameness, and wasting of the thigh, were referred; as there was no direct evidence of his having ever been subject to stone or gravel. On opening the body, I found the left kidney distended, but in texture reduced nearly to a pulp. In the lower part of the left ureter was a large calculus, apparently uric acid, almost two inches long, and weighing near five drachms. The ureter, thickened and enlarged, at the part where the calculus was lodged, was irritable upon its internal surface. Within the kidney and ureter was a little thin purulent fluid, of which the healthy bladder also contained some. The diseased kidney was injected, and found to have its internal membrane thickly sprinkled with small spots of extravasated vermilion, with little appearance of distinct vascularity. The left psoas muscle formed a large soft tumor, which, cut into, proved to be an extensive and very unusual instance of fungus hæmatodes; which had rendered the lower lumbar vertebræ carious, destroying the intervertebral substance.

338. Where a calculus has made its way through the whole extent of the canal, it may be arrested at the opening of the ureter into the bladder (194.); and such a case occurred not only to LE DRAN, but also to M. DESAULT, who opening the female bladder, by the cutting gorget, felt the stone by the

* Med. Commentaries, vol. vi.

forceps, but could not grasp it, as it seemed to slip away. A substance was felt, but not the peculiar sensation of a bare stone. The finger again passed, a tumor was felt, which yielded easily to pressure. The left fore-finger in the vagina assured M. DESAULT there was a stone in the tumor, and that it was situated about the termination of the ureter, which led him to suspect the stone was engaged in that part which passes obliquely through the coats of the bladder. This he ascertained to be the case, by passing his finger over the surface of the tumor, and feeling the membranous folds by which it was covered. For its liberation, an instrument having a concealed blade, termed a "coupe-bride," was introduced, and dividing the membrane by which the stone was covered, it dropped into the bladder, was extracted, and the patient did well.*

339. Obstruction in the ureter has sometimes arisen from the intrusion of hydatids. M. DESAULT presented to the Academy of Surgery a preparation from a female, one kidney being converted into an assemblage of hydatids, connected together by the finest peduncles; the ureter on the same side containing many more, the size of grapes, which appeared to have been detached from the cavity of the kidney, and arrested in their way through the ureter so as to prevent the escape of urine.

340. With regard to the question of a contractile power in the ureters, and their being consequently subject to obstruction from spasm, as far as respects practical importance, it may be easily determined; experience furnishing many arguments in its favour, and the present state of our knowledge no proofs to the contrary. I have in very many instances of affection of these tubes, found the pain, and as far as could be proved in the living body, the obstruction also, relieved and removed by antispasmodic remedies.

* Journal de Chirurg. tom. i.

341. As to the operation of confined flatus, or other matters within the intestines, tending to produce obstruction by pressure upon the ureter; it seems to me a cause the agency of which can very rarely prove serious. This is also the opinion of M. DESAULT, who observes that perhaps the most ordinary cause of pressure is the extension of disease in scirrhus uterus, and states the appearances found in a body brought for dissection; in the annexed case, however (Case 38.), I have been enabled to give the symptoms, with the appearances.

342. After all, it will generally happen that retention of urine in the ureters cannot be ascertained till after death, particularly if the affection be confined to one side, for in this case as the secretion declines in the one kidney, that of the other usually becomes more active and efficient. It is in fact, only when the preceding symptoms suggest the opinion of gravel, calculus, or other cause of obstruction existing in the kidney, that we can have any solid ground for supposing an obstruction in the ureter has taken place. Such opinion, however, is powerfully supported in some cases, by the patient's having on former occasions passed calculi from the kidneys; and in others by the pain and distress suddenly ceasing, and giving place to the usual indications of stone in the bladder. (111.)

343. The importance of this complaint will depend on the nature, magnitude, and situation of the obstruction, or whether both, or only one ureter, be affected. Opinion upon these points can, however, very rarely go beyond conjecture; neither would it often lead to advantage, were it otherwise, for medicine frequently can perform but little, and surgery still less, in relieving the symptoms.

344. The treatment that will be most conducive to comfort and recovery, will be conducted upon the general principles laid down for the relief of irritable or inflammatory affection of kidney (15.); and also for the treatment of stone in the ureter. (195.)

CASE 38.

Retention of Urine in the Ureters, with Ulcerated Bladder.

A MIDDLE-AGED woman received a violent blow upon the lower part of the abdomen, in *Aug.* 1818. The severity of pain consequent upon the injury declined, and feeling little from it, she supposed herself recovered. Her health was tolerable, and menstruation regular up to *April* 1821; at this period the catamenia left her, and incessant pains came on in the loins, sometimes with extreme severity. In the beginning of *August*, the urine was first observed to contain a whitish sediment, tinged with blood, furnishing no coagulum, but giving a crimson blush. *Aug.* 14. The bowels on the preceding day had been relaxed seven times; the motions thin and watery. For this the cretaceous mixture had been taken, with little effect. The stomach rejected every thing, with violent and frequent retching; the cheeks being red and flushed. Late the same evening a severe fit of tremor, convulsion, and insensibility, came on; but this subsided in about an hour. In the course of that day only a tea-cupful of urine passed, and the succeeding day (the 14th) none. That last voided was thick; but the sediment was less in quantity, though still tinged with blood. For the last few days she had complained excessively of the distressing pains in the loins; but said, she had no pain in the belly, neither could I perceive any tenderness on pressure in the seat of the bladder, though she admitted that sudden pressure about the navel gave pain. The pulse was 64, neither hard nor full. The tongue was somewhat white; the skin pale and clammy. This day it was observed that the right side was much prone to agitation. In the course of the morning she was visited, and prescribed for, by the physician; but early the following morning she died.

On opening the head, I found considerable serous effusion between the arachnoide and pia-matral

membranes, upon the surface of each hemisphere, and upon the basis, of the brain. There was little fluid in the ventricles, but upon the whole the state of the vascular system of the brain, proved the existence of congestion within the head.

In the abdomen, the stomach was contracted and empty. The intestines, liver, and spleen, were healthy; but there was some effusion of serum into the general cavity. The uterus was enlarged, to about three times its natural size, and its peritoneal covering very vascular. The right kidney was only half its natural size, and proved to be not only wasted, but reduced into cells. The pelvis, and ureter were much enlarged, from the continued pressure of the contained urine. The left kidney was large, but comparatively healthy. The infundibula, pelvis, and ureter, upon this side also, were distended in a less degree than on the right side.

On further dissection, the broad ligaments of the uterus, and the cellular membrane connected with them towards the ischiatic notch on each side, were found much thickened, forming an extensive scirrhous mass. I carefully removed the whole of the disease, when it appeared that the affection of the kidneys had arisen from the ureters being compressed, in consequence of their lower extremities being involved in the uterine disease.

I next divided the urethra and fore part of the bladder. Its cavity was not enlarged, but highly vascular. The posterior surface of its inner membrane near its neck was pushed up by a soft pulpy tumor, the size of a walnut, just behind which a recess appeared, and an opening was found, freely admitting the finger into the vagina. The rectum laid open, and washed, was sound; but the capillary vessels upon its inside were enlarged, opposite the part where the bowel was connected with the uterus.

A longitudinal section carried through the gut from behind, to lay open the vagina and uterus, exposed at once the primary seat of disease. The

cervix uteri, and in some measure the body of the womb, were destroyed, by an extensive ulceration, passing downwards into the vagina, and upwards nearly to the fundus of the uterus. The structure of the womb next to the ulcerated surface was of a soft consistence, like brain; but what remained beyond this was of a cartilaginous hardness. On a part of the ulcerated mass was the opening of communication with the cavity of the bladder; which opening sufficiently explained the appearances in the urine, while the other effects of disease demonstrated the true cause of the apparent want of secretion.

On Retention of Urine in the Bladder.

345. This kind of retention of urine, which may arise from any cause impeding the escape of that fluid by the urethra, proves that the bladder is capable of undergoing great expansion, so as to contain many pints, or even quarts, of urine; not only mounting upwards beyond the umbilicus, but occasionally protruding, either into the groin, or scrotum, so as to form hernia. (401.)

346. The distended bladder pressing backward into the rectum, and in the female, downwards into the vagina, may interfere with the proper functions of the bowels. In its progress upwards, carrying as it does, the peritoneal covering before it, the bladder advancing between that membrane and the abdominal muscles, presents an extended tumor in direct contact with those muscles, in the hypogastric region, where the bladder may be opened without risk of wounding the peritoneum.

347. Where the distended bladder remains unrelieved, the urine prevented flowing in freely by the ureters, they also become dilated. In this state, it has been observed by M. PETIT, there is a point of distention at which the opening of the ureter ceases to be valvular*; under which change, the

* Œuvres Posthum.

severity of distress is said to become less insupportable. Progressively, however, the expansion of the ureters is necessarily succeeded by retention within the kidneys, of which suspended secretion, or suppression is the consequence.

348. Retention in the bladder is readily ascertained. Want of power to pass urine, its being voided by drops, or small quantities at a time, constant desire to make water, continuing after a usual quantity has passed, straining preceding the act, a diminished stream, a sense of weight and tenesmus, all occasionally serve to point it out. Added to which, acute pains are felt in the seat of the bladder, urethra, and upwards towards the loins, sometimes with pain and cramps in the thighs.

349. To determine, however, with precision, the state of the bladder, the uniformly soft, circumscribed, and fluctuating tumor must be felt above the pubes, and examined also, pressing into the rectum, or vagina; and the undulation may be determined by the finger, at either of the two last-mentioned points, by producing slight vibrations in that part of the tumor above the pubes.

350. Retention of urine in the bladder, if complete, is a very serious complaint, requiring prompt assistance; which if deferred, leads to alarming or fatal consequences. The bladder long distended, loses its power of contraction, and this is restored with difficulty. It is extremely apt to become irritable and inflamed, and then falls into a sort of gangrenous suppuration, of which I have seen several instances. (Case 56.)

351. Sometimes rupture of the bladder takes place, and the urine is dispersed in the cellular texture surrounding the pelvis, forming tumor in the perineum, scrotum, and penis. M. DESAULT observes, that sometimes the contents of the bladder are thus effused between the parietes of the abdomen, producing deposits, and generally end-

ing in fistulous openings, and gangrenous suppuration of the parts.

352. In the treatment of this retention, the first object is to empty the bladder, as soon as possible ; the second, to remove or relieve the disorder, of which the retention was the consequence. The first object is best attained by the introduction of the catheter, an operation of perfect ease, where the urethra is free from obstruction ; and those cases of retention that occur from obstructed urethra, may with more propriety be referred to under their proper heads. It is, at present, intended to consider the introduction of the catheter, under circumstances in which the canal of the urethra is free.

353. The catheter, either of silver, metallic alloy, or elastic gum, is selected as to its diameter and length, suitably to the age of the patient, and the particular circumstances of the case. In the construction of the catheter, the perforations towards its extremity were formerly made small and numerous, but of late, one comparatively large oval opening on each side of the tube, the edge rendered extremely smooth, has been generally preferred. The smaller openings being very subject to be obstructed by viscid albuminous sediment, coagula of blood, or other matters in the urine.

354. As a general rule, a large-sized catheter, as less likely to deviate from the proper course of the canal, is preferable to a small one. Upon this point, M. DESAULT observes, "*elles entrent plus facilement, effacent, en entrant, les plis du canal, empêchent de faire de fausses routes, et donnent à l'urine une issue plus facile.*" When, however, an obstruction exists, a small instrument is, of course, in general, more convenient.

355. The form, or curvature of the catheter, is subject to variation ; the only important rule is to set the instrument to that figure in which the point may, with the greatest ease and certainty, be

directed along the upper side of the canal, till it has fairly entered the bladder.

356. Where it appears desirable to avoid using a hard or inflexible instrument, a catheter of elastic gum may be chosen in preference; and this, according to circumstances, may be introduced alone, or upon a curved metallic stilet, subsequently withdrawn. Any laboured detail, as to the course of the instrument, or the minute anatomy of the parts, to those already acquainted with the anatomy of these organs, would be superfluous; and to those uninformed in these matters, it would be useless, such instruments in the hand of an inexperienced person being much more likely to take a wrong, than a right, direction.

357. We are assured of the catheter having reached the bladder by the depth to which it has passed, by feeling no resistance to its further progress, and especially by the free stream of urine.

358. The whole of the urine having been allowed to flow off, some writers advise injecting the bladder for the purpose of diluting and washing away any mucous matter; a suggestion that may be valuable, where a quantity passes with difficulty; but having never seen the necessity for applying this precept, while I have seen a bladder, already irritable, thrown into great discomposure from the simplest injection (Case 88.), I should rarely feel disposed to adopt this practice.

359. Where an elastic catheter is to be worn for some time, care must be taken that it shall pass so far into the canal as that its eyes only shall project into the cavity of the bladder, to avoid the ill consequences that may attend unnecessary irritation (Case 62.); the outer part being safely tied, and secured to a bandage passing round the waist; for when attached to a few threads tied round the parts, behind the prepuce, irritation and ulceration are most frequently the consequence. The external opening of the instrument may be closed

with a small plug, and the urine evacuated according to circumstances, two, three, or four times a day. When a catheter of silver is employed, it must be also secured, if left in the bladder, from slipping out of its place.

360. Any metallic instrument is, however, worn with less comfort by a patient, than one of elastic gum, unless during confinement to bed, where the handle of the metallic catheter, very much in the way of the clothes when dressed, is not productive of so much inconvenience.

361. The catheter, especially if of elastic gum, should every few days be carefully removed, according to its known power of resisting the influence of the urine (Case 61.); it should then be washed and cleared from any adherent mucous, calculous, or other matter, and carefully examined, to ascertain if any part is softened or injured, by remaining in the urethra; and if rough, cracked, or otherwise damaged, it must on no account be again used, as the rough surface may cause irritation, or the injured portion breaking off, may lodge in the bladder, and lay the foundation for stone.

362. We shall now pass on to consider the causes of retention of urine more in detail, referring these to three general heads. First, those affections in which the coats of the bladder are deprived of their contractile force, from age, excess, the abuse of diuretics, affection of brain or spinal marrow, overdistention, inflammation or spasm of bladder, &c. Second, affections from causes within the cavity of the bladder, fungous tumor, coagulum of blood, extremely tenacious mucous, or albuminous matter, effused from its inner membrane, &c. Third, affections, the consequence of displacement either of the bladder, or other viscera, producing pressure on the urethra, or tumors, which, in their development, produce the same effect. Rupture of the bladder from external violence, an accident un-

connected with external wound, but attended with some of the appearances of retention, will be lastly noticed.

SECT. II.

On Retention, from Age.

363. THE urinary bladder, like most other parts of the body, is subject, on the advance of age, to lose partially or entirely its power of contraction. It may still expel the urine, but only by requiring the aid of the abdominal muscles to assist its own powers of expulsion.

The patient, perhaps conscious of having never had complaint in the urethra, observes that although he still voids his urine in as full a stream as before, he has not the same power to empty the bladder quickly or perfectly.

364. This kind of retention, rarely complete, generally admits of the urine being voided in the same quantity as secreted, and is therefore seldom productive of serious consequences. A tumid state of bladder from this cause may continue a long time without inducing further inconvenience, than an unpleasant sense of weight about the pubes and perineum. M. SABATIER was once consulted by a lady for a tumor that appeared subsequent to her accouchement, which turned out to be nothing more than the bladder excessively distended with urine.

365. Frequently this complaint passes on without regard, being considered as an infirmity natural to age; while the urine, too long detained in the bladder, becomes putrid, and eventually reduces the inner coat of the bladder to nearly the same state. (Case 56.)

366. The indications in this case are to evacuate the urine, and restore the tone of the bladder; both purposes being sometimes answered by the regular use of the catheter. In the early stages of this complaint, the sudden application of cold to the surface of the body is frequently effectual in enabling the patient to void his urine. At this period

it is important to attend to the first inclination that occurs to pass water, as every hour of delay tends still further to disable the bladder from assisting itself.

367. Where the loss of power is complete, the only resource is the catheter, passed at intervals or kept in the bladder. In some cases an elastic catheter may be most convenient, but where the instrument is not retained in the bladder, a large-sized silver catheter will have the advantage.

368. The treatment necessarily tedious, and the use of the catheter often required for the rest of the patient's life, will sometimes render it expedient to teach him to pass the instrument for himself. Every now and then it will be also right that he should endeavour to void his urine by the natural efforts, ascertaining afterward by the catheter whether the bladder was emptied.

369. Diuretics and balsamics, cold bathing, stimulating applications, and even astringent injections into the bladder, have all been recommended and used, without benefit. The only dependence is on the catheter; where this fails, no other means succeed.

370. A person is mentioned by M. DESAULT, aged 87, who two years subject to this complaint, had then uneasiness come on in the glans and perineum, bloody urine, and other symptoms of stone, aggravated by any error in diet, or agitation of mind. The calculus felt by the catheter in the neck of the bladder, the operation was performed, the only inconvenience attending which was a considerable hæmorrhage, which it was for some hours attempted to relieve by compression. For the day and night after the operation, urine flowed freely by the wound, but the following day almost ceased. The little that appeared, tinged with blood, argued a coagulum forming in the bladder. Beyond the pains incident to the operation, the patient now began to feel an anxiety and weight insupportable. A smart attack of fever, with frequent hiccups and vomiting succeeded during the night, an oblong

tumor with fluctuation being felt in the seat of the bladder. This last circumstance explained the cause of all his suffering, to relieve which an elastic catheter was passed into the bladder, and near a pint of bloody urine drawn off. Some coagula still remained behind, which reddened the injections then thrown up into the bladder; but frequently repeated, they succeeded at last in removing the whole, and the patient, thus delivered from the effects of the accident that caused the sudden retention, improved hourly, and in twenty days had entirely recovered from the operation; during which period a catheter was kept in the bladder.

SECT. III.

On Retention, from Paralytic Affection.

371. RETENTION of urine may not only arise from the debility of advanced age, for it may occur at any earlier period of life, from the operation of accidental causes, diminishing or destroying the nervous energy, by which the muscular coat of the bladder is enabled to contract.

372. This affection is observed by M. DESAULT to be an occasional consequence of circumstances already noticed (293.), forming, however, one of those results of extreme debility I have rarely met with. In one case of complete retention, from a cause related to that alluded to, I was desired to see a youth, who within a few weeks after marriage had an attack of retention, which obliged me to pass the catheter regularly for several weeks, before the voluntary powers were restored.

373. Retention is said sometimes to arise from the too free use of diuretic medicines, in which case it exactly resembles the same affection of bladder from other causes.

374. Diminished nervous power is a cause of retention that rarely follows injury to the head, but is a frequent consequence of violent strain, or other injury to the spine. Luxation or fracture of the

vertebræ of the neck, back, or loins, generally induces paralysis. An instance of this is mentioned by Mr. WATSON, in a bricklayer, who fell and dislocated the eighth dorsal vertebra. It was presently reduced, but paralysis of the lower limbs was the consequence; and the following day retention of urine came on, requiring the regular use of the catheter for a fortnight. At this period he had involuntary discharge of urine and fæces; though before, it was with the greatest difficulty a stool could be procured, either by purges or glyster. During this fortnight the urine drawn off was very thick, fœtid, and bloody, loaded with mucus, and some few calculous particles. In the third week mortification commenced at various points on the lower extremities, of which he died, and leave could not be obtained for examining the body.* An instance is also mentioned by M. DESAULT, in a traveller overturned and severely bruised, who a week after the accident sought relief for a tumor in the seat of the bladder, which he could not believe to be the bladder, as he was able to get rid of urine. A catheter, however, by removing the contents, and with it the tumor, undeceived him; and as there was no permanent injury to the spine, the regular introduction of this instrument for six weeks was all the assistance he required to aid his recovery.

375. Violent twists of any part of the spine, producing effusion of blood upon the theca vertebralis, will be followed by paralytic affection; sometimes, as happened in a case that I have related in another series†, this consequence takes place at an interval of many months after the receipt of the injury.

376. The effusion of purulent matter within the theca vertebralis will in some diseases produce this affection of bladder, of which, in the work last referred to, I have related a very curious and singularly

* From a MS. in Mr. HEAVISIDE'S Museum.

† Practical Observations in Surgery and Morbid Anatomy. Case 30.

interesting example, in which the origins of all the nerves on the basis of the brain, as well as those of the medulla spinalis, were enveloped in a puriform fluid. In one instance I have found this affection, in common with the other effects of progressive paralysis, consequent to a very unusual complaint; a disease of the joint formed between the atlas, and odontoid process of the second cervical vertebra. The capsule of this joint exceedingly thickened, the process itself was forced backward, inducing a fatal compression of the spinal marrow.* In another case I have observed this affection of bladder to be the slow result of increasing pressure from accumulation of water in the ventricles of the brain. (Case 39.)

377. When retention of urine is produced by affection of the spinal marrow, the weakness and deficient sensation in the lower extremities will generally explain the nature of the cause. The patient suffers little, is almost ignorant of his state, and insensible of any derangement in the functions of the urinary organs; although the fluctuating tumor felt above the pubis will at once inform the surgeon of the necessity for passing a catheter.

378. In one instance of this complaint, most unusually obscure in its cause, and unexpected in its favourable termination, a lady declined gradually into the most complete and wretched state of paralysis, having totally lost all power of motion and feeling, in body and limbs; and during near seven weeks that she remained in this unhappy state, I was under the necessity of regularly passing the catheter. The urine had generally an oily appearance, was usually of a deep-brown colour, with a peculiar alkaline foetor, so powerful as to render the apartment almost insupportable. This last circumstance was supposed to proceed from some disease taking place in the inner membrane of the bladder. At last, the constitution began most un-

* This curious disease is preserved in Mr. HEAVISIDE'S Museum.

expectedly to rally; the feeling first, and then the voluntary powers, by degrees returned, and in six months the patient had almost perfectly recovered. In another instance of paralysis, where from the same peculiar and intolerable foetor of the urine it was impossible to mistake its being a similar affection to the above, I was enabled to see the state of the parts after death, and the appearances confirmed the opinion previously entertained of the former case, demonstrating a peculiar affection of the mucous membrane of the bladder. (Case 40.)

379. Retention of urine will also sometimes arise from that weakness consequent to over-distention of the bladder, where the patient has too long neglected to evacuate its contents.

380. In the treatment required in affections from injury of the vertebral column, local bleeding, blisters, setons, or caustics, near the seat of the injury, include all that aid which surgery can administer, where dislocation is not present. In addition to these means, proper medicines should be directed, where feverish indisposition is present; which attentions will sometimes prevent inflammatory effusion and its ill consequences.

381. The local management of all these affections will consist in relieving the full bladder from time to time by the catheter; until the parts recover themselves, so as to enable the patient to void his urine by the natural efforts.

CASE 39.

Retention, from Paralysis of the Bladder.

A MAN, aged 37, of sober and silent temper, complained of a violent pain in his head, *Dec.* 1816. He had also for many months been distressed by severe pains in the loins, to relieve which he had worn flannel; this latter complaint was supposed to arise from gravel, of which he had occasionally detected small fragments, passing with his urine.

When the distressing pain in his head commenced, he used, on coming home, to say he could not think what ailed him, for in walking something seemed to come over his eyes, so that he could not see. He was always worse and heavy towards night; but could get no sleep.

A young man who was helper in the same stables observed, he wished he would stay at home, and not come at all till he was better, for he did his work so awkwardly, that he often expected the horses to kick him; as in dressing them, he frequently went to the heels instead of the head.

Dec. 24. Unable to stand without reeling, occasionally with delirium, he was obliged to remain at home. The eyes appeared vacant, and without perception, even when a lighted candle was passed across the face. Medicines were directed, but within a week, more frequently light-headed, he required constant watching, to prevent his leaving his bed. In this state he continued, till he first experienced difficulty in voiding his urine, and soon totally lost that power.

Jan. 4. I was requested to see him, and drew off by the catheter two pints of healthy urine. His speech incoherent, and yet rational. The catheter was passed regularly till his death, but on the third day after I first saw him, he was so unruly, as to require to be confined; the following week he became more tranquil. The pulse was all along very nearly natural. The bowels latterly not only sluggish, but insensible, to a degree; the most active purgatives, and most powerful injections failing. He died *Jan. 13. 1817.*

On laying aside the dura mater, I observed the pia mater to be unusually dry, as if it had been all night exposed to the air. The lateral and third ventricles, were distended with at least four ounces of serum. The brain was rather firm, so that the ventricles did not collapse, when empty.

In the left kidney, the mamillary processes were

of a dark-red colour, as if irritable; this appearance did not extend beyond the basis of each mamilla. There was no trace of calculous matter, nor of that peculiar aspect of the membrane lining these cavities, usually seen in gravel.

The bladder, which was perfectly healthy, contained half a pint of urine.

CASE 40.

Retention of Urine, from Paralysis of the Bladder.

IN Sept. 1809, a woman aged 52, died in the St. George's Infirmary, having been long infirm and imbecile. Six weeks before her death, her stools and urine passed away involuntarily, but she felt no pain. The urine when observed by the nurse, was thick, extremely offensive, and occasionally tinged with blood.

For sixteen days previous to her decease, the water ceased to flow, requiring the catheter regularly; the urine gradually assuming the dark-red or brown colour of putrid blood, and becoming so insupportably offensive, that at last the room in which she lay could scarcely be endured, when the water had been recently drawn off.

A curious circumstance in this case was, that for the last week, whenever the catheter was passed, she had a regular attack of rigor, exactly like the first stage of a paroxysm of intermittent fever.

The only appearance of disease, after death, was in the urinary bladder, which externally was observed to be larger than common. This viscus is usually found contracted upon its contents, but in this instance it lay flaccid, nearly empty, but without tone or disposition to contract. This state appeared to be the consequence of paralysis, and of disease perhaps consequent to it. The coats of the bladder, considering its relaxed state, were not wasted, but the reverse. The cavity of the bladder was in a state of disease. The surface of the mu-

cous membrane was in parts highly vascular and bright, the prevailing tinge being a dark-olive or grey colour. In some points the surface was ulcerated, in small superficial spots; in others the substance of the membrane was black and putrid.

A few ounces of extremely foetid, red, turbid urine, were found in the bladder, which, without further relaxation, would have contained at least a quart.

SECT. IV.

On Retention, from Inflammation of the Bladder.

382. It is observed by M. DESAULT, that "those who have written upon the diseases of the urinary organs, attribute opposite effects to inflammation of the neck, and of the body of the bladder; placing the first among the causes of retention, the second with those of incontinence of urine; under the impression that the bladder inflamed and more sensible, far from being weakened, acquired more energy, and contracted with more force than before. If, however, we were not undeceived by having seen many retentions of urine caused by inflamed bladder, analogy might lead us out of the error. We never see a muscle contract itself under inflammation, and if obliged to act, it evinces very feeble power." M. DESAULT adds, that "those who have opened bodies have constantly found inflamed bowels distended, not contracted." Upon this point, as regards the bladder, there may well be a difference in opinion.

383. The functions of the bladder in health, are comparatively simple, but under disease, either of itself, or of surrounding parts, it is under the necessity of assuming new powers. An inflammatory affection of the bladder is, I believe, never confined entirely to the muscular coat, and it therefore seems to me there can be no case in which reasoning by analogy from inflammation in muscles, can correctly be said to apply. Either the mucous mem-

brane within, or the peritoneal covering without, or both, have been always, as far as I have seen, more or less involved in the same state; and consequently the phenomena of irritation become blended with the symptoms of inflammation.

384. Attending to symptoms alone, it appears to me, that did inflammation of the body of the bladder necessarily incur loss of power of contraction, it would be difficult to explain the frequent and urgent desire to pass water, that I have invariably observed, wherever inflammatory symptoms were present.

385. This affection may be induced by exposure to cold, excess in drinking, stimulating diuretics, or other heating medicines. I have known several instances in which it originated from injecting to cure gonorrhœa, and such a case is mentioned by Mr. BAILLIE, in which opiates, bleeding, warm bathing, &c. failed to relieve; but which was eventually overcome by large doses of camphor, at short intervals.* I have known it take place upon the decline of small-pox (Case 41.), and have also occasionally seen it brought on by painful affections of kidney. (Case 42.) Its accession may be known by frequent desire to void urine, acute pain in the seat of the bladder, increased during efforts to relieve itself, the pain shooting upwards to the loins, and down to the extremity of the urethra, a frequent hard pulse, and other symptoms of fever, aggravation of pain upon slight pressure above the pubes; the ease with which a catheter is introduced, the extreme pain when the point of the instrument touches the inside of the bladder, and lastly, the deep colour and inflamed appearance of the urine.

386. Inflammation of the bladder requires the most prompt assistance. The urine must be evacuated; but the catheter, passed with the utmost caution, must be introduced only so far as to permit

* Edinburgh Med. Journ. vol. vii.

the urine to flow, to avoid exciting fresh irritation. M. DESAULT advises a mucilaginous decoction, as of linseed, to be injected into the bladder, previous to removing the catheter, part of such injection being allowed to remain, to lessen the acrimony of the urine; recommending also that the urine be drawn off every three or four hours.

387. The most active measures for subduing local inflammation in other parts (20.), will be frequently required here. Bleeding, cupping, leeching, and warm baths, aided by proper medical treatment, may, according to the particular circumstances of the case be needful, for the removal of this complaint.

CASE 41.

Retention, from Inflammation at the Neck of the Bladder.

A YOUNG gentleman, aged 18, was attacked with retention of urine, Nov. 13. 1819. He was attended by his apothecary, but as the means used for his relief failed, I was requested to visit him on the 15th, and found him in great pain, with a very full bladder, nearly up to the navel. Without the least difficulty, I passed a silver catheter, and drew off above three pints of urine. He was directed to take a draught every six hours, containing ten grains of the compound powder of ipecacuanha. With some variation, a similar medical plan was continued for a fortnight, the introduction of the catheter being required night and morning. The warm bath was repeatedly tried, but like his medicines, failed to relieve him from constant pain, frequent desire, and total loss of power to void his urine. At the expiration of the fortnight, he found the power of expulsion gradually return; and by degrees perfectly recovered.

The above attack was connected with, and appeared to be produced by an eruptive complaint. He had recently taken the small-pox, from which

he suffered rather severely; and the retention of urine had come on suddenly, with severe pain at the neck of the bladder, upon the decline of the eruption.

CASE 42.

Retention of Urine, from Inflammation at the Neck of the Bladder, consequent to Affection of Kidney.

A SERVANT woman, aged 27, found her health failing from hard work, in *Sept.* 1820. The catamenia ceased, she was distressed with a sense of heat and burning at the neck of the bladder, continual desire to make water, and pressure or bearing down. Disturbed often in the night to void her urine, she scarcely passed a spoonful at a time, with severe pain, as if boiling water was pouring from her. Another symptom, from the first, was a violent pain across the loins, which she thought was in the kidneys. At intervals these pains were very severe, and generally most so during the night. She never felt numbness in the lower limbs, but had frequent and severe pains in the thighs, striking down from the back through the groins, and down the inside of each thigh, obliging her to lie down many an hour during the day; frequently with total loss of appetite, and feverish heat and thirst.

March 11. 1821. In an hospital, six weeks confined, with inflammation of the bowels, and flooding; and for most of the period, with retention of urine, requiring the catheter. Her health continued bad after leaving the hospital.

December 7. 1821. She was admitted into the Infirmary, complaining still of pain at the loins, sense of weight and uneasiness in the bladder, and frequency in making water. Mr. HEAVISIDE first directed an astringent injection to be thrown up into the vagina, but after a fortnight's trial, this was laid aside. Gentle opiate and anodyne me-

dicines were now ordered; they answered well, and were continued for some time.

January 22. 1822. Complaining exceedingly of weakness, and total want of appetite, an infusion of bark, with sulphate of magnesia, and tincture of orange peel, was directed. It seemed to strengthen her, but the skin became hot, and there was more distress in passing water; for these reasons, it was laid aside. A few days after, an acute pain in the side, catching the breath, came on; this was removed by blistering and medicine. Subsequent to her relief from pain in the side, the anodyne plan was again resorted to with some benefit, and continued till *April 6.* when I directed a blister to be applied, and kept open upon the loins.

April 25. The pain at the loins greatly relieved by the blister, which slipping from its place, did (perhaps fortunately) more than was intended. The pricking and darting pains down the thighs, and desire to pass water, were much less frequent than before. The urine now, for the first time, deposited a thin stratum of fine albuminous powder, and a little cloud of mucous matter. Upon the whole, she felt better than for many months. The bowels regular, and pulse good, she was merely directed a gentle opiate at bed time. The blister was kept open for three weeks, and then allowed to heal.

May 4. She was so nearly recovered, that she expressed a wish to return to service, and was discharged.

SECT. V.

On Retention, from Gouty Spasm at the Neck of the Bladder.

388. IN certain states of gouty constitution, I have not unfrequently witnessed temporary distress from retention of urine; from spasm seizing

upon the neck of the bladder. This is rarely a tedious affection; at least, in the instances I have seen, the spasm has generally subsided before the introduction of the catheter has been urgently required.

389. In addition to gout, M. DESAULT enumerates several other complaints, as rheumatism, lues, psora, suppressed gonorrhœa, &c., as capable of occasionally exciting irritation, and consequent retention. The last of these causes, however, I have known bring on symptoms of so decidedly inflammatory a character, as to leave no room for doubt.

390. The introduction of the catheter merely procuring temporary relief, the object must be by soothing, and other proper means, to relieve the neck of the bladder, by such medical treatment as may restore, if possible, the original affection to its former seat. With this view, diaphoretic remedies may be proper, to favour the return of any eruptive complaint that may have prematurely disappeared. Opiates and anodynes, will be conducive to relief, where gout or rheumatism have been concerned. When, however, these complaints are disposed to be obstinate, daily experience unhappily evinces how little we can calculate on assistance from medicine.

SECT. VI.

On Retention, from Strangulated Hernia.

391. STRANGULATED hernia may be placed among the occasional, though not common causes of retention of urine. I am not aware of its having been so regarded by others, but having repeatedly seen it, and once when from the severity of pain in the seat of the primary disorder it passed too long unnoticed, it becomes right to direct the attention to at least the possible occurrence of this additional source of distress.

392. The annexed cases demonstrate the fact, without need of comment. They particularly show the propriety of attending to this circumstance in our enquiries in strangulated hernia; and if they are answered vaguely or unsatisfactorily, the patient should not be allowed too long to evade the permitting a catheter to be passed. He must be unable to distinguish, by his own feelings, what proportion of his sufferings may arise from the retention; and in this way, if relief is not afforded, the lesser evil may become the most serious, or at least, painful of the two, in its ultimate consequences.

393. In these cases, it appears to me, that the affection of the neck of the bladder is the consequence of sympathetic irritation, as happens in those complaints in which a similar effect is induced by inflammation, or other disorder, either in the lower part of the rectum, or about the verge of the anus. Several important examples of these sympathetic affections of the neck of the bladder, have been lately brought forward.*

CASE 43.

Retention of Urine, from Strangulated Hernia.

May 15. 1822. I was called up early to see a man, aged 60, suffering from severe griping and twisting pains in the bowels. He said he was subject to bilious attacks, and supposed this to be so, although he this morning, for the first time in his life, felt uneasiness and pain in the bladder, without having the power to void any water, notwithstanding constant desire and frequent attempts. The pulse was only 64, and not hard. The skin rather cold. For his relief I directed an aperient mixture to be taken, in small doses, at short intervals.

* Pract. Obs. on the Diseases of the Lower Intestines and Anus. Last edition.

At noon, I found the stomach had not rejected the medicine ; but there had been no action of the bowels, nor any material alleviation in the symptoms. The pulse was below 70. He now said he had occasionally a little fulness at the navel, but did not know if that had any connection with his other complaints ; but as there was neither vomiting or sickness, the part was not then examined.

At 3 P. M., I was told there had been a violent sickness at stomach, during which he had thrown up a large basinful of fluid, principally the medicines taken ; but there had been no stools, although the pains in the bowels were more severe than ever. He had with great straining and repeated efforts passed about a table-spoonful of water, but was in much pain from a full bladder, though he declined having his water drawn off at present. The skin was now warm and moist, pulse 120, and weak. What he had previously mentioned now glanced across my mind, as to the swelling at the navel, and it was examined. It contained a small bit of intestine, just beneath the thin integuments ; it was easily distinguished, and happily as easily reduced, the flatus within the gut returning first, and the bowel after it. The vacant opening was in the linea alba, just above the umbilicus.

He felt immediate relief, and said he was already better than he had been since he was first seized, on the preceding day. He was instructed to send immediately to a proper person to fit on a truss, which during the evening he procured.

At 10 P. M., I found him very feverish, and although a bandage and pad had been fitted on, he had laid them aside, from an idea that he felt more pain than before. On examination, the bowel was ascertained to have slipped down again. He observed, notwithstanding, that he was easier since a second fit of vomiting, that had emptied the stomach, and relieved the bowels from a load of fluid matter.

I again reduced the intestine, and replaced the bandage, which prevented its protruding again. In addition to the aperient medicine, which was continued, he was directed to lose eight ounces of blood by cupping, upon the loins.

May 16. 10 A. M. The cupping had greatly relieved the pain in his inside; he soon after found his bowels actively at work, and had a copious loose stool; then, and not before, he found himself relieved from all the pain, distress, and difficulty about the bladder, the urine flowing without the least straining, in a full and free stream; the bladder was emptied at once of near two pints of water, to his great comfort. Several more stools followed in the course of the night; with which he passed urine, as in health. The medicine was desired to be repeated occasionally, during the day.

May 17. He found himself weak, but otherwise perfectly recovered.

This man a few months afterwards fell ill, and died, from another cause. I obtained permission to examine the body, but found no peculiar appearance to explain the previous occurrence of spasm at the neck of the bladder.

CASE 44.

Retention of Urine, from Strangulated Hernia.

Sept. 3. 1822. I was requested to visit a woman, aged 39, with a rather large strangulated femoral hernia. For the last three days there had been copious fæcal vomiting; and costiveness for the last week. She had been subject to rupture for ten or eleven years, but had rarely suffered pain. Taken into the house, as the pulse was not in a state to bleed, the hot bath was prepared, and this as well as the tobacco-fume injection failing, she was advised to submit to the operation, as the only means for saving her life; her husband, how-

ever, objected to this, and preferred her returning home, where she tried various medicines.

Sept. 7. The tumor much less painful, and less tense; the abdomen still inflated and tender. I was now informed that although the medicines had failed to procure a stool, she had at three this morning began to make water, and had during the forenoon voided a very large quantity involuntarily; having previously had complete retention since five in the morning of *Sept. 4.*, a period of three days and nights, wanting two hours. There was now no distinct feel of tumor in the bladder; and she would not allow a catheter to be passed, as even this, in her mind, looked something like an operation. From this time the urine flowed off freely several pints every day, till *Sept. 12.*, when she died.

On examination, the appearances usual in strangulated hernia, presented themselves. The healthy bladder contained only a few ounces of water. The protruded omentum was universally adherent; but the small extent of intestine ileum, also in the sac, was unadherent. Both the bowel, and omentum, were much inflamed.

SECT. VII.

On Retention, from Tumor, or other Growth, within the Bladder.

394. TUMORS, either of a fungous texture or of a cancerous nature (Cases 34 and 35.), or hydatids formed in the bladder, constitute the most frequent sources of this kind of retention. A very singular specimen of disease is preserved, however, in which a preteratural fold of the inner membrane of the bladder, extending from the orifice of each ureter to the opening into the urethra, forming a valve on each attempt to void urine, at first impeded its free exit,

and at length proved fatal, with symptoms not unlike those that attend in bad strictures.*

395. Few diseases are more distressing, or more uniformly fatal, than fungous or other tumors within the bladder. Now and then, however, the characters even of these diseases do not prove cancerous, and tumors appended by a narrow neck, presenting at the orifice of the female urethra, have been successfully extirpated. A young woman from a strain had gradual retention of urine brought on. This continuing near three years, frequently in pain, and weakened from bleedings occasioned by the constant use of the catheter, she applied to Mr. WARNER, who passing with difficulty his finger by the urethra, found a considerable fleshy tumor, attached near the neck of the bladder. This tumor, first discovered by herself about twenty months before, depriving her of the power of passing her water, was removed by an operation. With a full bladder she was made to strain, when the tumor pressing forth was secured by a crooked needle and ligature passed through its substance. It was next necessary to divide the urethra; when by pulling the tumor, there was sufficient room for tying a ligature round its broad basis. For a few days she had a good deal of pain in the abdomen. On the sixth day the tumor dropped off. From the day of the operation she voided her urine without assistance; and soon perfectly recovered.†

396. A case nearly similar to the above is mentioned by RUYSCH, in which excrescences sprung from the internal surface of the male bladder, the largest, the size of a walnut, being attached by a narrow neck so near the opening of the urethra as frequently to require the introduction of the catheter. Where these tumors form near the neck of the

* The preparation is in Mr. HEAVISIDE'S Museum. See PLATE II. *Fig. 3.*

† Phil. Trans. vol. xlv.

bladder they may sometimes be mistaken for incipient affection of prostate gland.

397. During life, however, the existence of this disease can never be with certainty determined. The point of the catheter, in sounding, may lead the surgeon to suspect the presence of some preternatural substance; but an indurated state of the coats of the bladder, the formation of cells, the existence of fasciculi, or tumors of a totally different kind, either in the bladder, or parts around it, may deceive, rendering opinion extremely equivocal.

398. Neither are we yet acquainted with any successful mode of treatment in this formidable disease. If upon the suspicion of its existence, or the certainty of there being stone, the bladder is opened by the operation for lithotomy, and by the aid of the finger such a tumor is found attached by a narrow neck, it may be either pulled away, or included in a ligature, and the patient may recover. A man operated upon for stone in the Hôtel-Dieu, was found to have a fungous tumor in the bladder. M. DESAULT first removed the calculus, and then feeling the exact position of the fungus, seized it with the forceps, and twisted it away; and the patient was in the usual time sent out, perfectly recovered.

399. Cancerous tumor of large size within the bladder, is sometimes productive of retention. In one such case a man became subject to heavy and lancinating pains within the pubes, for which in progress of time he was sounded, and believed to have stone, by the impression of firm resistance felt in the bladder. At the Hôtel-Dieu, M. DESAULT found in the seat of the bladder a constant lancinating pain, with occasional bleeding, and uneasiness about the glans. From time to time small fragments of apparently purulent flesh passed the urethra, deciding the nature of the disease. After some time, the tumor greatly enlarged, nearly filled

the cavity of the bladder, scarcely admitting the escape of urine, and quite preventing the surgeon of the place passing a catheter. An instrument, however, was afterwards got into the bladder, with slight relief, but a most painful death soon followed. On examination, a carcinomatous tumor, larger than two fists, was found growing from the neck of the bladder, and filling its cavity.

400. In another case, a scirrhus disease was connected with small painful tumors felt in that part of the rectum towards the bladder, attended with great pain, harassing tenesmus, difficulty, and at last total retention of urine; with hourly increasing distress and pain, loss of flesh and strength, from which he was released by death, after six months' suffering. On examination, the rectum much contracted, presented a series of excrescences; some irritable, others ulcerated. The bladder was empty, contracted, and indurated.

SECT. VIII.

On Retention, from Hernia of the Bladder.

401. HERNIA of the urinary bladder, is an event of very rare occurrence. Mr. POTT met with only two instances of it in the course of his practice. In one of these the tumor always disappeared upon emptying the bladder; in the other a part of the bladder was removed by an operation, and the wound healed without a single bad symptom.* A case is mentioned by MERY, of a supposed hydrocele, that always disappeared upon evacuating the contents of the bladder.†

402. Protrusion of the urinary bladder, now and then taking place in parts where tumors very frequently become the objects of operative surgery; it becomes of no less importance to the safety of the

* POTT's Works, vol. iii.

† Mémoires de l'Acad. Roy. des Sciences.

patient, than to the character of the surgeon, to acquire the power of clear discrimination.

403. The fullest and best information upon this subject, is contained in a paper by M. VERDIER, who after giving instances where the urinary bladder protruded alone, states one in which a surgeon called to operate for hernia, on his arrival found his patient dead. Opening the hernial sac, he perceived not only intestine, but bladder also, down in the scrotum. In the protruded part of the bladder were four calculi, the size of small nuts, and a fifth in that portion of the bladder remaining within the pelvis.

404. The following was met with by RUYSCH. "Un marchand d'Amsterdam attaqué d'une grand difficulté d'uriner, ne pouvoit rendre ses urines, qu'en élevant les bourses, et les comprimant avec les mains. Cette incommodité étoit causée par une hernie de la vessie ; ce qui fut reconnu après la mort, par la dissection d'un bubonocèle avec étranglement, auquel il n'avoit pas été possible de remédier ; l'intestine iléon qui formoit la descente, se trouva gangrené, et une grande portion de la vessie étoit passée dans la scrotum."

405. M. VERDIER, mentions, "Un homme tourmenté des accidens de la pierre, que l'on n'avoit pû reconnoître, ni par l'introduction de la bougie, ni par la sonde, mais que l'on découvrit après sa mort : la pierre fut trouvée dans une portion de la vessie passée dans un des côtés du scrotum, l'autre côté renfermait une portion d'intestin grêle."

406. The same gentleman relates the case of a peasant, who with retention of urine and œdema of the parts around, had a large swelling at the groin, opened by a country surgeon, who astonished at seeing urine instead of pus evacuated, crammed the wound with lint, and the distress being increased instead of relieved, M. GUYON was sent for ; who released the parts by removing the applications, dressed them lightly, and to ensure the

urine passing by the urethra, kept a catheter in the bladder. By this means he saved the man's life, and the wound healed in two months. He adds, "Un autre, aussi peu instruit, voyant une tumeur inguinale, circonscrite, fort dure, sans changement de couleur à la peau, la crut un bubon vénérien skirreux. Dans cette idée, il appliqua les cataplasmes, et les emplâtres les plus émolliens; enfin ennuyé du peu d'effet de ces topiques, il se détermina à appliquer un caustique sur la tumeur, et à inciser ensuite l'escarre; mais quel fut l'étonnement de ce chirurgien, lorsqu'il apperçut une pierre dans la sac qu'il avoit ouvert; la sortie continuelle de l'urine par la playe, ne laissa aucun doute sur le vrai caractère de la maladie." *

407. A boy with retention of urine had a tumor with œdema in the right groin, opened by STALPART VANDERWIEL; when out dropped a calculus. He concludes, "Puer autem tam per virgam, quam per foramen prope inguen continue tribus etiam post annis lotium excrevit, quamquam hoc sensim minutum, ac tandem sanatum fuerit." In another, "Quindecim annorum adolescentem, cui post diuturnum dolorem, cujus causa erat ureteri inhærens calculus, tandem ulcus in inguine ortum est, per quod ille exiens ægrum dolore liberavit, fistula tantum ibidem superstite, per quam continue guttatim urina stillabat." †

408. A case of this kind, combined with strangulated hernia, obliged M. MAURAIN to operate; the bowel gangrenous was not returned, the bladder so adherent that it was of necessity left in the scrotum. The patient died the next day, and on examination, the adhesions of the bladder to the scrotum and ring, were found to be unusually strong. ‡ In a second case, under M. PETIT's care, "Le malade disoit encore avoir senti plusieurs petites

* Mém. de l'Acad. Roy. de Chir. tom. iv.

† Obs. Rarior. Cent. Prior.

‡ Mém. de l'Acad. Roy. de Chir.

pierres rondes amassées dans la tumeur du scrotum, lesquelles repassoient sans peine dans la vessie, et sortoient ensuite par l'urètre." *

409. M. DE LA PORTE met with a retention in which he felt no distention above the pubes, but only a tumor in each groin, the size of an egg, removed by drawing off three pints of urine. †

410. The bladder has also been occasionally protruded between the fibres of the abdominal muscles; and in the female in the perineum, and through the vagina not very unfrequently (Case 45.), sometimes with prolapsus of the uterus. A young unmarried hysteric woman, subject to a convulsive dry cough, was seized with retention of urine; the catheter was introduced, but with difficulty. The cough frequently inducing the return, and the difficulty of passing the catheter, at last led to examining the vagina, in which a large fluctuating tumor was found; but no urine came by compression, unless while the catheter was in the bladder. The urine evacuated, the tumor disappeared, and the catheter could be easily passed, though the difficulty returned as the urine collected again. ‡

411. The full bladder has also occasionally been protruded before the head of the child, in labour, but the general symptoms in this sort of hernia, the fluctuating feel, the impediment in passing water, together with the power of diminishing or removing the tumor by the catheter, the tumor being always situated in the vicinity of the bladder, should enable the practitioner to determine accurately upon the case, whenever it presents. An instance, however, is recorded in Dr. MERRIMAN'S valuable work, where the distended bladder protruding before the foetal head, was mistaken for hydrocephalus, and very improperly opened. The bladder sloughed extensively, and the poor woman

* Mém. de l'Acad. Roy. de Chir.

† Ibid.

‡ Sandifort. Observationes Anat. Patholog.

was eventually reduced to the distressing condition of perpetual incontinence of urine for the rest of her life. *

412. A very singularly complicated case is published by Dr. WHITE; of a young woman, who after six years of suffering, died from a large tumor formed by a prolapsus of the womb. It was so irritable and extremely painful, as to admit of no attempts towards its reduction. On dissection, the small intestines were in the pelvis, the uterus and appendages protruded, the ureters increased in size and length, and passing down into the prolapsus, where lay the bladder, the fundus turned downwards, with a calculus of four ounces in it, which was supposed to have led to the whole of the mischief. †

CASE 45.

Retention of Urine, from Prolapsus of the Bladder.

IN Sept. 1815, I visited a poor woman, for a loss of power to pass her urine. She was middle-aged, had suffered much from hard work, hard living, and the labour incident to rearing a large family. Here was an occasional protrusion of a soft tumor externally, producing distress, with loss of power to void her urine. This tumor, most commonly troublesome after fatigue, was easily pressed back, or disappeared spontaneously on lying down, and never came on in that position. This protrusion was scarcely ever attended with much bearing down, as she had discovered a mode of relieving herself from the want of power to pass her water, by pressing back the tumor, which always enabled her to empty the bladder, after which the swelling did not for some time return, even under exertion.

Upon examination in the erect posture, I found

* Synopsis of Difficult Partur. 3d edit.

† Med. Observ. and Enquir. vol. iii.

protruding from between the labiæ a large, soft, elastic tumor, evidently containing a fluid. The finger passed readily below it along the vagina to the uterus, but could not be made to pass in any other direction. Reduction was easily effected by the finger, but unless she evacuated the contents of the bladder it immediately came down again.

As this was the whole extent of the evil, I had only to assure her there was nothing of danger about it; pointing out at the same time, that she might prevent its recurrence, by wearing a small light instrument, of elastic gum, so adapted as to support the upper part of the vagina. This, however, as she was satisfied upon the nature of her infirmity, she thought unnecessary, and declined.

SECT. IX.

On Retention, from Displacement of the Viscera of the Pelvis.

413. THE displacement of parts within the pelvis, giving birth to retention, may be either a retroversion, or prolapsus, of the womb, prolapsus of the vagina, or of the intestine rectum.

414. When the intimate connection of these parts with the urinary bladder is considered, it becomes evident that these viscera can suffer no material derangement of position, without involving more or less that of the bladder of urine; and that whatever may be its force in contracting, it will not then have the power of expelling the whole of the contained urine. To this deficient power of action, under such circumstances, must in every case be added an increased resistance from obstruction to the passage through the urethra.

415. In retroverted womb, the os uteri from its new position presses the urethra and neck of the bladder upwards and forwards, against the bones of the pelvis; thus obstructing the passage of the urine. In prolapsus of the womb, vagina, or

rectum, the posterior part and neck of the bladder are, on the contrary, drawn downwards and backwards; circumstances that must always be taken into account in every attempt to pass an instrument into the bladder.

416. When retention is the consequence of retroverted womb, the fact will be easily determined by finding the os uteri, in examining per vaginam, displaced, thrown upwards and forwards, perhaps beyond the reach of the finger; under which predicament the precise state of the case cannot be decided, till a catheter passed, and the water drawn off, may place the parts in circumstances more favourable for examination, and replacement.

417. Should retention be owing to either of the above causes, it will be determined upon reducing the displaced parts, by the effect ceasing when the cause no longer exists. Or where prolapsus of the rectum has given rise to this affection, it will be sufficiently obvious by the difficulty in voiding urine not coming on till after the protrusion has taken place.

418. Retention of urine from these causes rarely becomes serious. It is first necessary that, if possible, the displaced parts be reduced; and where this reduction does not restore the power of passing urine, the catheter should be introduced.

419. Prolapsus of the womb, when reduced, requires that the parts be carefully and constantly supported, by the gentle pressure of soft pads, kept in their place by a T bandage. With the same view for present relief, a pad may be applied to prevent a return of protrusion in the rectum; although the radical cure of this infirmity can only be obtained by an operation which I have often performed with perfect success.*

420. Where, however, the displacement cannot be reduced, nor the bladder be thus enabled to

* Practical Observations on the Diseases of the Lower Intestines and Anus. Last edit.

relieve itself, the catheter should be passed, and the performance of this operation will be much facilitated by giving the instrument a considerable curve, enabling it to follow the presumed course of the urethra, according to the particular circumstances of the case. Sometimes where the metallic catheter fails, one of elastic gum, being flexible, may find its way into the bladder.

421. Should it however, happen, as it sometimes does, that none of these means succeed, and the bladder be in danger of being ruptured, which accident has sometimes happened (435.), it will be necessary, in order to prevent either this, or other serious consequence of over-distention, to puncture the bladder; an operation, the place, time, and expediency of which will be demonstrated in a future part of these observations. (651.)

SECT. X.

On Retention, from Pressure of the Womb upon the Neck of the Bladder.

422. THE period of utero-gestation is sometimes, by the weight or position of the pregnant womb, productive of inconvenience to the functions of the urinary organs, and occasionally induces retention of urine.

423. These complaints most frequently occur either in the latter stages of pregnancy, or come on during the severe pains of labour, when the head of the child filling the space of the pelvis, sometimes produces injurious pressure upon the other soft parts, included within the same circle.

424. Frequent desire to void urine, and deficiency in the quantity passed, although they may be our only guides, are but uncertain signs of retention; as irritable bladder may induce the one, and compression of the ureters the other, of these symptoms.

425. The most important practical rule, in the

management of this kind of retention, is that of carefully attending to it by the catheter for as long as may be necessary. Where it happens during labour, the bladder may in general be readily relieved by waiting for the interval between the pains, when the head of the child, either retiring spontaneously, or gently pressed back, will afford every facility for introducing the catheter, and drawing off the urine. Cases of bladder ruptured during labour have now and then occurred. (436.)

426. Where the womb is enlarged in consequence of disease, it is sometimes productive of retention of urine, which may for a long time require the use of the catheter; where, however, these complaints eventually become cancerous, the retention at last usually gives way, an involuntary discharge succeeding, from ulceration making its way into the bladder.

SECT. XI.

On Retention, from Pressure of the Rectum upon the Neck of the Bladder.

427. THE degree of derangement in the state and functions of the rectum some patients will endure without appearing to regard present health, or future consequences, is almost incredible. Among other inconveniences occasionally induced by a loaded state of the lower bowel, is retention of urine.

428. It is observed by M. DESAULT, that when retention arises from this cause, it operates in the same way as the gravid uterus. It appears to me, however, from repeated observations, that the two cases differ materially from each other. The gravid uterus, I should suppose, would act purely by mechanical pressure; the loaded rectum, long observation has taught me, may be considered to operate in all cases, more or less, by irritation. The mass of hardened bilious fæcal matters constituting the load, extremely fœtid and offensive, may well be expected to excite and irritate the bowel and parts

around into a state favourable to the production of spasm.

429. This is one ground for believing irritation from acrimonious contents in the bowel, may conduce to retention of urine. Another reason for this opinion is, my having in various cases observed that acrid, slimy, mucous matter lodged in the lower part of the rectum, any spasmodic tendency or any permanent contraction in the bowel, although perhaps attended with little or no pain, will and do excite spasm at the neck of the bladder, or in other words retention of urine, relieved by the expulsion of the cause of irritation from the bowel, or by any means calculated to sooth and quiet irritability, and compose the disturbed state of the parts.

430. An instructive case is related by Mr. GOOCH, in which with difficulty he passed a catheter, and drew off several pints of urine, where retention had been produced by an immense heap of hardened fæces accumulated in the rectum, which he had great difficulty in afterwards removing, by injections, and various mechanical means. In another case, the same effect took place, from neglect, in paralytic disease.

431. The correctness of the above remarks is abundantly proved by the circumstances and symptoms attendant upon a great variety of cases of irritation or disease, in the lower part of the alimentary canal, already published; which, although calculated to throw much additional light upon the pathology of these parts, it would be out of place to particularly specify upon the present occasion.

432. Whatever may be the state of the rectum, whether loaded with fæces, attacked with inflammation, or subjected to other diseased change, where it induces retention of urine, the catheter, or bougies, or both, according to the circumstances of the case, will constitute the proper local treat-

ment, which must be held subservient to that by which the primary affection may be removed, or, where that is impracticable, relieved.

SECT. XII.

On Retention, from Rupture of the Bladder.

433. WHENEVER, from external violence, or other cause, the urinary bladder is ruptured, the chances of recovery are so small, and the importance of knowing at once the nature and importance of the case so great, that it becomes the duty of every practitioner to render his judgment, upon such a point, at once prompt, clear, and conclusive.

434. The including this accident among the varieties of retention is, I am aware, open to objection; as rupture of the bladder, in fact, incurs effusion, rather than retention. Principally, however, desirous to render these remarks practically useful, and conscious that this accident may at any time become the object of sudden and serious regard to the practitioner, whose very looks are watched by the fearful eye of anxious expectation, I hope the motive will plead an excuse for any apparent deviation from method, when a weightier and more important object is in question.

435. A very instructive though unfortunate case of ruptured bladder, is related by Mr. LYNN. It occurred during pregnancy, in consequence of retrovertio uteri. The catheter could not be effectually introduced, nor could the fundus of the womb be moved from the cavity of the pelvis, into which it had fallen. It was proposed that the bladder should be punctured, from above the pubes, but the patient could not be persuaded to submit to the operation. The following day she said she felt something burst within her, and found immediate relief from pain. A miscarriage followed, and now the catheter passed with ease. No water

being found, it was clear the sensation described, had arisen from rupture of the bladder. The poor woman died early the next day. *

436. An instance, in which the fundus of the bladder was ruptured either in, or soon after, labour, is related by Mr. HEY. The fifth day after confinement, the patient felt something crack at her navel, and pain directly became severe at that part. Peritoneal inflammation came on; and though every proper means was employed, she died, ten days after her delivery. Fourteen pints of urine were found in the abdomen. †

437. In one case in which rupture was the consequence of external violence, a corpulent man, in boxing was thrown, and his antagonist falling upon him, with his knee on his abdomen, he received so much injury as to occasion his death within a few days; during which period he made not a drop of water. On passing the catheter, a little thick grumous blood came away, but no urine. If the instrument was moved ever so gently, when in the bladder, it gave him very great pain, though the mere passing it through the urethra gave none. After death, the bladder was found largely ruptured on its fore part, at or near the fundus. The intestines were much thickened, and inflamed. ‡

438. A man is also mentioned by Mr. WATSON, brought into the Westminster Hospital, with fractured elbow, who died the second day. Retention of urine required the repeated use of the catheter, which brought away very bloody urine. At first, he made a little with great difficulty, the catheter not being passed till next day, when four ounces only of water were drawn off. Towards evening, eighteen ounces more were drawn off, to his great relief. The abdomen was fomented, and glysters, &c. given.

* Med. Obs. and Enquir. vol. iv.

† Ibid.

‡ From a MS. of Mr. WATSON's, in Mr. HEAVISIDE's Museum.

This man had fallen, intoxicated, from a loft, crosswise, down upon a beam in a warehouse below, and afterwards to the ground, where he was found next morning. He became rather comatose, but felt very little pain, and so continued till he died.

On examination, the os pubis was found fractured on each side its symphysis. A large rounded splinter having been forced through the fore part of the bladder into its cavity, so fixed, that the urine did not flow out freely by the opening, though some of it had escaped into the cellular membrane external to the bladder, to some distance. The splinter was not, however, felt in the introduction of the catheter. *

439. In the following instance, the forcible separation of the symphysis pubis ruptured the bladder. A clergyman riding, his horse startled, and sprung suddenly round. The scrotum became violently ecchymosed, and he felt extremely hurt, but was clear he had received no blow, though at the instant, and since, he felt "as if split asunder." Two days after, passing no urine, a catheter was introduced, and no water found. The scrotum continued to enlarge, and the right thigh swelled, with evident fluctuation. These circumstances induced Dr. CAMERON to believe the urine had escaped, most probably, by the urethra having been lacerated. On the third day, the scrotum punctured, blood and urine flowed out. The fourth day, the right thigh was punctured, with the same effect. Peritoneal inflammation came on, and he died on the sixth day. The parts, on examination, were found very extensively mortified; the ossa pubis wrenched asunder to the distance of four inches, and a rent in the bladder, half an inch in length, a little above the neck, and exactly in the middle, where the ossa pubis join. †

* From a MS. in the Museum of Mr. HEAVISIDE.

† Phil. Trans. vol. xlv.

440. In one case of ruptured bladder, which I was desired to examine after death, the patient only lived a few days (Case 46.); and, in a more recent instance, seen during life by Mr. CHAVASSE; the man, the nature of whose accident could not be traced, had the usual symptoms of peritoneal inflammation, and died on the fourth day. The bladder was found ruptured at the part covered by the peritoneum; the abdomen contained two quarts of urinous fluid, and the bowels were connected together by effused lymph.

441. In these unhappy circumstances, I should recommend, in addition to the vigorous adoption of every antiphlogistic treatment, attention to two points: the one, the keeping a large elastic catheter constantly in the bladder, inserted just so far as to let the urine flow, without getting far enough to endanger its passing into the wound; the other, the constant observance of a sitting posture, in which the gravitation of the urine, if the catheter is properly placed, its outer opening low and constantly open, will rather tend to its running safely off by the urethra, while the pressure of the viscera above will also tend to compress the bladder, and favour its healing, provided the fatal effects from previous effusion are happily avoided.

CASE 46.

Retention, from Rupture of the Bladder.

ON the evening of *Friday, Nov. 13. 1812*, a robust heavy man, intoxicated, was thrown from his horse, over a post, the top of which struck the lower part of the abdomen. He was taken up and carried senseless to bed. The next morning, on the same horse, he rode to town (eight miles); in much pain from bruises upon the lower part of the belly and about the loins.

On reaching London, Mr. BARROW was requested to visit him, and found the lower part of the abdomen, scrotum, and penis, discoloured by ecchy-

mosis. He was in great pain, with a pulse naturally irritable, now very quick and intermittent. He said that since the accident, though he had made repeated attempts, he had totally lost the power of making water. This led to the introduction of the catheter, but no water flowed; the same evening, the instrument a second time passed, no urine followed.

Sunday 15. This morning, the catheter again introduced, without urine; it was remarked, there was in this case the appearance of retention, but no sense of urgent desire to void urine, as happens in actual retention. From the peculiarity of these circumstances, Mr. HEAVISIDE was consulted, by whom the catheter was during the day twice passed with ease into the bladder, without a drop of urine following. It thus appeared, that one of two things had happened, either the kidneys from injury had ceased to secrete, or the urine had some way of escape into the abdomen.

Bleeding, general and local, had been had recourse to, and the most proper medicines given for averting the danger of peritoneal inflammation, which however, came on; and the patient in spite of every effort, became rapidly worse. On the *Monday* morning he had delirium, became violent, but towards evening more quiet, he sunk and expired, just seventy-two hours after the accident.

I was requested to examine the body; upon which was extensive extravasation of blood, as above described. The peritoneum lining the anterior parietes, and that covering the bladder, much discoloured from extravasated blood and inflammation. Upon the posterior surface of the bladder was a large opening, admitting the finger freely into its cavity. A catheter introduced by the urethra, passed through this opening, into the general cavity of the abdomen. On removing the bladder, the cellular membrane between it, the pubes, and adjacent muscles, was loaded with coagulated and

grumous blood, and from the cavity of the abdomen, near the opening in the bladder, a coagulum of blood, of several ounces was taken. About three pints of urinous fluid tinged with blood, were removed from the abdomen, much more remaining behind.

The muscular coat of the bladder, at the point of laceration, had retracted, giving the appearance of a piece cut out, the size of a sixpence; the inner and outer surfaces exhibiting spots of effused blood.

It appears then, that at the time of the accident the bladder distended with urine, was in the fall violently bruised between the projecting bodies of the vertebræ, and the post over which the man fell; and as there was a thick layer of fat, besides muscles, integuments, and clothes, interposed between the post and the bladder; while, on the other hand, the posterior part of that viscus was driven absolutely against the bones of the spine; the part least defended was most injured, the rupture taking place opposite the bodies of the vertebræ.

On Retention of Urine in the Urethra.

442. THE cause of retention of urine in the urethra may exist either in the canal itself, under the form of inflammation, or its consequences; or in the parts surrounding the canal, as happens in enlargement of the prostate gland, or in other tumors external to the urethra; or, lastly, it may be found within the passage of the urethra, as in contractions or other such affections of that tube, or the lodgement of extraneous bodies within it.

SECT. XIII.

On Retention, from Inflammation of the Urethra.

443. INFLAMMATION of the urethra, when violent, sometimes becomes a cause of retention of urine.

The sides of the canal becoming tumefied, the passage through it must be in proportion restricted.

444. Inflammation of the urethra may arise from any common cause, violently stimulating medicines taken internally, or applied externally, the contact of the venereal poison, the awkward and unskilful use of the catheter, bougies charged with irritating substances, external violence, the use of injections, &c.

445. Inflammation of the urethra may be readily ascertained, by intense heat and pain in the passage, aggravated in voiding the urine. The lightest pressure along the course of the canal exciting most acute pain, sometimes inducing a degree of circumscribed tumor upon some part of the canal. The stream of urine being small, the pain and difficulty in passing it great.

446. The most rigid attention, as regards the treatment of this affection, will be required in the adoption of all those means capable of relieving inflammation in other parts. Repeated bleedings from the arm, leeches to the perineum, assisted by the warm bath, aperient and febrifuge medicines, demulcent drinks, and a very low diet, are the principal means of relief in this complaint.

447. Should the retention of urine be complete, and the bladder require to be relieved, a small-sized silver catheter, with the eyes finely polished, directed by a light and expert hand, will perhaps be the best means for drawing off the urine. The smaller the size of the instrument, the less will the inflamed part of the canal be put upon the stretch, and the smoother the surface, the less will be the irritation from its introduction; and as to the rest, the smallest instrument in the hand of a good surgeon, in such a case, can be in no danger of going wrong.

448. Where inflammation and tumor at some one point, is followed by abscess, breaking into the canal of the urethra, it is by some writers consi-

dered indispensable to wear an elastic catheter, till the abscess is healed, to prevent the urine getting in, so as to keep up irritation. In one such case, however, circumstances prevented an instrument being kept in the bladder. A point, however, which appeared to be of little importance, for, so far from preventing, it did not seem to retard the process of healing, which was completed in about three weeks; within which time, all discharge had ceased (463.), and the man had perfectly recovered.

449. As a rule for general adoption, it is in these cases desirable, that by an instrument kept in the bladder, the urine should be conveyed away from time to time, to prevent its getting into, and irritating the purulent cavity of the abscess; the instance referred to only shows that it is not always indispensable, and that where the habit is good, the patient may do well under its omission.

SECT. XIV.

On Gonorrhœa.

450. UPON the subject of gonorrhœa it would be extremely easy to enlarge, but it would be nevertheless unsuitable to the object of the present work, as the whole that is at present known, of practical importance, may be said in very few words.

451. It is clearly established that the same matter which in one person produces gonorrhœa, will in another produce chancre; and that this difference depends on the disposition of the habit to favour the production of the one, in preference to the other effect, of the venereal poison.

452. The seat of gonorrhœal irritation is the canal of the urethra, for the space of about an inch within the external orifice. Mr. HUNTER, M. DESAULT, and others, have found the appearances of slight, or of decided inflammation, in this part of the canal, in examining such as have died with this complaint upon them.

453. Occasionally, M. DESAULT observes, appearances of abrasion or excoriation, occur, but never the formation of true ulceration. I have never myself had an opportunity of inspecting after death the appearances produced by gonorrhœa alone, but in the numerous and various occasions upon which I have examined these appearances where there had been discharge combined with other disease, I have only in one case ever found perfect ulceration (Case 61.); and this was under so extensive a complication of infirmities, as to afford no argument for the urethra's being disposed to ulcerate from slight causes.

454. As to the nature of the matter discharged in gonorrhœa, I have repeatedly examined it under the microscope, as well as most of the other varieties of purulent and albuminous excretions from mucous and ulcerated surfaces, without having been able to perceive any essential difference between pus taken out of an ulcer and pus excreted from the surface of the inflamed urethra in gonorrhœa.

455. The gonorrhœal virus excites no particular sensation in the moment of its application, nor until the irritation connected with inflammation and discharge comes on, which may occupy a very variable period; generally these symptoms are observed within a few days, but sometimes not till many weeks subsequent to infection. The patient first feels an unusual sensation within the orifice of the urethra, perhaps extending to some distance along the canal, rather a sense of titillation than pain.

456. On inspection, the orifice of the urethra appears more open, and the vessels more turgid, than in health. A degree of moisture and discharge soon follows, in some cases pale in colour, and thin in consistence, in other instances of a deeper yellow, thick, and even ropy. Along the lower line of the penis, the course of the urethra is also felt as a full, softish, tender cord.

457. The inflamed state of the inner membrane of

the urethra, changes the properties of its secretion, and the natural mucus, which in health preserves that membrane from the immediate contact of the urine, is rendered soluble in that fluid, so that as often as the urine flows the secreted matter is washed away; and this circumstance, together with the inflamed state of the membrane, explains the burning heat and acute pain in making water, always felt with more or less violence in gonorrhœa.

458. In consequence of excessive irritability in the parts, painful erections or chordee arise. This symptom is generally most troublesome when the patient is warm in bed, and frequently disturbs him from sleep. Not at first very painful, it soon becomes more so, and sometimes produces most extreme distress, as the disease advances. The immediate cause of the pain, under these circumstances, is the violent extension of the canal of the urethra, while in a state of acute inflammation.

459. When the pain incident to the irritation of chordee has attained its highest point of severity, there is generally a perceptible diminution in the quantity of discharge; these circumstances indicate the complaint having reached its acmé.

460. This period is of all others the most important. If the constitution be strong and plethoric, abscess in perineo will sometimes take place, and that very suddenly; or should weakness and irritability prevail, erysipelas, and even mortification may be the result. The inflammatory action also at this time is extremely prone to change its seat, being transferred to the neck of the bladder, prostate gland, or testicle.

461. Where the inflammatory action, thus transferred, settles upon the deeper seated parts of the urethra, a degree of thickening and disposition to permanent contraction may remain long after the inflammation itself is subdued; laying a silent but sure foundation for future complaints of a very different character.

462. Occasionally the inflammation in the cellular membrane surrounding the spongy part of the urethra, will go on to produce abscess, either along the course of the urethra anterior to the scrotum, or behind the scrotum in the perineum. When this happens, the urethra rarely escapes some degree of permanent contraction.

463. When abscess does take place, there is always ground for apprehension, that should the gathering break into the urethra, the urine in flowing perpetually along the canal, will find its way into the cavity of the abscess, and prove a source of fresh mischief. This is by far the most frequent consequence of abscess in perineo, but sometimes the patient will escape unexpectedly well under this accident. A soldier in the 82d regiment, was reported, *Sept. 9. 1808.* I found he had much pain in passing water, free discharge, and a puffy tumor of the prepuce, preventing retraction. As it was doubtful whether there might not be concealed chancre as well as gonorrhœa, the mercurial frictions were directed, for sixteen nights, when his mouth affected, the frictions were laid aside. He now took cold, passed a bad night, with severe pains in the head, back, loins, and bowels; these pains appeared to be of an inflammatory nature. Uneasy about the bladder, he had constant desire to void urine. The next morning there was no discharge from the urethra. Towards noon, the severity of his pains obliged him to go to bed; and in the evening he took some diaphoretic medicines, and a copious perspiration brought relief. The following night he slept little, with constant urgency to pass urine; and early in the morning he felt something give way, and a very copious flow of matter immediately took place from the urethra, continuing for two hours. It appeared that a small tumor had formed behind the scrotum, where he now said he had felt heat and pain for two days before. Perfect ease followed

the bursting of the tumor. A curved bougie of full size, was every day passed with ease into the bladder. The abscess in perineo from the moment of its breaking was not again felt. Under common medical treatment the discharge and other symptoms were soon gone, and within three weeks he returned to his duty, well.

464. The most frequent result of abscess in perineo, especially if complicated with stricture, is the escape of urine into the cavity, and an eventual sloughing, more or less extensive, of the cellular membrane.

465. Should the gonorrhoeal irritation be transferred to the prostate gland, it excites a wearisome and distressing sense of uneasiness; a dull, heavy, deep seated pain at the neck of the bladder. The prostate gland thus affected, if examined by the rectum, will be found somewhat tumid, and tender to the touch, which it is not naturally. There may be also wandering pains about the intestine rectum, and perhaps an occasional momentary inability to pass the water. These affections of prostate gland now and then give rise to very peculiar sympathetic complaints; a curious instance of which will be presently mentioned. (Case 47.)

466. When inflammation from gonorrhoea is transferred to the deeper seated parts of the urethra, the irritation very frequently extends itself thence to the testicle; and pain and swelling are the consequence. In some cases, the swelling slowly increases for a week or two, with constant uneasiness, but comparatively little acute pain. Occasionally the affection comes forward rapidly, with extreme pain and symptomatic fever. Capt. F. of the marines, was under treatment for gonorrhoea at Scarborough, in 1809; and was using an injection for its cure. After a week his right testicle became tender, painful, and began to swell. A circumstance so unexpected alarmed him, and he immediately sent to me, to beg that I would call upon

him. He told me what had happened, and showed me the testicle extremely hot, tender, painful, and swelled to the size of a large orange; the violence of pain increasing, with heat, thirst, and a hard pulse at 130.

It appeared that the injection had answered his expectation admirably, for the discharge was gone. For his relief, he was ordered a brisk purgative, to be repeated every four hours; and directed to keep the testicle supported, and wrapped in linen, kept wetted with a cold saturnine lotion; observing the strictest abstinence.

467. By the next day, the bowels were opened, and the pulse somewhat quieter, the testicle was much less painful, and rather softer. The feverish heat lessened, on the succeeding night he got some sleep. By the end of the week, under this plan he was able for a few hours to leave his bed, and in three weeks was well; the discharge from the urethra returning, as the affection of testicle subsided.

468. Where inflammation of testicle has once taken place, it is occasionally very apt to return from the slightest cause. A person, for instance, who has had swelled testicle, brought on in the first instance by the improper use of injections prematurely suppressing the discharge, may subsequently find himself liable to similar attacks, from a spontaneous retrocession of gonorrhœal discharge, perhaps from taking cold, or drinking wine, without the use of any local application. Of this I have seen repeated instances, although this is not a very common accident.

469. Even when the tumor of a swelled testicle is reduced, and the patient convalescent, the greatest caution will sometimes be required. After three weeks' close confinement to bed, under the most active treatment and rigid abstinence, this affection returned upon one patient of mine, the very first time he was allowed to leave his bed;

notwithstanding he only moved in the most gentle manner along the ward of his hospital, with his testicle well supported, and this happened in a constitution which had been to all appearance sufficiently lowered to have rendered it incapable of supporting, much less reproducing, inflammatory action.

470. Under some states of constitution, gonorrhœa may produce much inconvenience, although the discharge be neither checked by injections, nor the inflammation disposed to metastasis. The local affection may operate by establishing a sphere of irritation, extending to the surrounding parts; and giving rise to various distressing nervous affections. Of which the most common is a dull heavy pain about the groins, with a tender, irritable, and perhaps enlarged state of the lymphatic glands. This state of these parts, however, can always be readily distinguished from inflammatory tumor.

471. This kind of irritation induces a peculiar, diffused, and irksome pain. The whole inguinal space feels tender to the touch, and perhaps the inguinal glands are enlarged, but they are comparatively free and moveable under the skin, which is relaxed and moist. The absorption of the venereal virus excites less extensive disturbance. The poison transmitted by one absorbent vessel, passes from the immediate seat of infection to the next lymphatic gland, and upon this, and this only, it usually produces its primary effects. Active inflammation follows, and considerable tumor, most frequently attended with much pain, heat, and throbbing; and in general disposed to suppuration. Tumors from irritation very rarely suppurate.

472. Where the habit is weak, irritable, and disposed to scrofula, the most distressing sympathies are, I think, induced from gonorrhœa; extremely irksome aching pains extend themselves from the urethra to the neck of the bladder, testicles, perineum, and groins; while the increased action upon

the inner membrane of the urethra, spreads externally over the glans and prepuce, with an astonishingly copious secretion of purulent matter. Considering, however, the ease with which the prepuce thus tumefied may be retracted, and also that the pain is still of a dull and heavy kind without material sense of heat, this affection appears destitute of any decided character of acute inflammation.

473. Irritation from gonorrhœa will occasionally induce inflammation of some one of the absorbent vessels, forming a red line beneath the skin, and feeling like a packthread in the cellular membrane. In one instance, I am pretty sure that I have seen the large vein upon the dorsum of the penis inflamed from this cause. A gentleman was under my care for gonorrhœa, in 1811. The symptoms were mild. One night incautiously washing the prepuce and glans in cold water, an œdematous swelling of the prepuce followed, with the appearance of a hard round cord, extending from the root of the glans backward to the crest of the pubes. This cord was thick as a writing quill towards the root of the penis, and very superficial, from this point becoming gradually smaller, as it advanced forward; just behind the glans it appeared to sink down into the substance of that body, and could be traced no further. It was not constantly painful, but subject to occasional irritation, which always arose as an acute pain, continuing a few minutes; commencing near the root of the penis, and extending from that point toward the glans.

This affection after some weeks gradually disappeared, the hardened cord becoming less distinct to the touch, and the returns of irritation less frequent.

474. Had this been an inflamed absorbent, the line so thin as scarcely to be felt, should have been of equal thickness throughout; whereas its diameter, at the pubes one-fourth of an inch, was not at the root of the glans more than one-sixteenth of an inch.

The absorbents pass in lines nearly straight, and when inflamed discolour the skin; this vessel took the serpentine course usual with a vein, producing no change in the colour of the skin. I am not aware that this occurrence has been before noticed as an occasional effect of gonorrhœa.

475. In one other case of gonorrhœa with phimosis, I have observed a hardened cord, nearly similar to the above, form beneath the skin; but this was so far from painful or irritable, that it appeared to be divested of sensibility, giving no sensation when very freely examined.

476. Of all constitutions, that disposed to a mixed kind of inflammation, a combination of erysipelatous and phlegmonous action, appears to be least favourable for the receipt of gonorrhœa. At least I have witnessed one most unhappy instance in support of such an opinion.

477. A healthy looking young man, of fair complexion, and light hair, was admitted into one of the infirmaries of this metropolis, in 1799, for gonorrhœa, which had commenced a few days before. There was copious discharge, much pain in making water, with an unusual and tense tumefaction of the whole penis, the surface very hot, and of a shining red colour. Aperient medicine, and fomentations, were ordered. Inflammation, however, so rapidly increased, that by the next day it threatened the worst consequences; and opium, bark, wine, and porter, were administered under the direction of the physician and surgeon, to prevent, if possible, threatened mortification, which event, however, took place very quickly; the local symptoms excessively severe, the pulse 130, and the skin burning with heat. The disposition to gangrene had no sooner appeared upon the end of the penis, than he complained of great pain in each groin, where the lymphatic glands, from extreme irritation, were already tender and enlarged. The best treatment, medical and surgical, was unavail-

ing; and the ravage of disease continued to extend so quickly, that in three days, the penis was almost consumed, the inguinal tumors having undergone similar changes, and sinking down from violent inflammation to mortification. The fever typhoid, and destruction still spreading, this poor young man died, completely exhausted by the furious progress of disease, although he was apparently in perfect health nine days before, and had, during his illness, the most kind attention, and the best professional assistance.

478. A frequent desire to pass water, with urgency and straining, constitutes the most usual form of irritation at the neck of the bladder. These symptoms sometimes occur in gonorrhœa, but are so generally the effect of the treatment, rather than the course of the disease, that they hardly merit consideration as symptoms, although occasionally attendant circumstances.

479. Where the inflammatory stage of gonorrhœa has been properly treated without local applications, there may perhaps, for a few days, arise a perceptible degree of irritation, but only such as to excite little attention, and less inconvenience. When, however, injections have been used, they are not unfrequently followed by a most distressing and permanent irritability of bladder; and instances are not wanting, even within the circle of my own experience, where this organ has from this cause become the seat of incurable irritation and constant misery to the patient, for the rest of his life.

480. The modes of treatment adopted for the cure of gonorrhœa are so extremely various, that it would consume much time unprofitably, to describe them. The following remarks will contain little more than the outline of the plan that I generally prefer, believing it to be as frequently successful as any other, and certainly much more safe than those methods of treatment conducted on other principles.

481. Upon the first accession of the symptoms, the patient should place his diet under some restriction, dependant on state of constitution. If plethoric, he should lay aside or take but little wine or malt-liquor, using little exercise, with an aperient draught night and morning. If the habit of body is less disposed to excitement, the restrictions may be less rigidly observed; but the bowels still kept open, with care to avoid fatigue.

482. As the complaint advances, the symptoms increase, and chordee becomes generally one of the most incessant sources of distress. In this stage leeches may, in some cases, be applied with advantage, aided by light, saline, diaphoretic, and aperient medicines, directed at short intervals. The taking only mucilaginous decoctions, avoiding animal food, and keeping quiet, will generally procure much relief. Should these means not succeed, an anodyne draught will frequently operate well, in allaying irritation, and procuring quiet repose.

483. Some practitioners are in the habit, from the first, of directing the liquor potassæ, continuing its use till the decline of the inflammatory symptoms. This medicine, however, is extremely uncertain in its effects. I have, in some cases, found it answer very well, but in others, it has excited uneasiness and irritation about the neck of the bladder, and more than once, much difficulty as well as straining, in voiding the urine. So that where I now direct this medicine, it is always in combination with some aperient, to prevent its remaining long in the bowels.

484. Where the symptoms have reached their highest point, and are upon the balance towards decline, they will, for a short time, require more close attention. If the least constitutional disturbance, fulness of pulse, heat of skin, or thirst occur, the diet should be rendered still more abstinent, and the diluent system be brought still further into adoption.

485. Should there, at this period, be any manifestation of increased uneasiness or tumor about the deeper seated parts of the urethra, no time must be lost, in preventing the continuance of such tendency; by confinement to bed, with saline diaphoretics in the strong, and compound powder of ipecacuanha in the weak; and also by the free use of various farinaceous decoctions. Where the continuance of these means scarcely arrest the progress of the threatened evil, leeches upon the parts, or cupping glasses near them, must be directed; followed by fomentations.

486. Sometimes, from the previous use of injections, a tumor forms upon the urethra, anterior to the scrotum, and requires to be, if possible, dispersed; as was the case with a gentleman who very lately placed himself under my care. The discharge had ceased; and but for the threatened abscess, and the fear of stricture, he would have supposed himself cured. By careful attention to the bowels, by restricting the diet, and keeping down the pulse, with the constant application of cold lotions to the part, the discharge from the urethra was restored, while the tumor was progressively dispersed; in six or seven weeks the swelling was so nearly gone, as to admit the direction of medicines that quietly removed the discharge, which, by a full-sized bougie passing freely into the bladder, was found to be the only remaining complaint.

487. Occasionally however, abscess will form, either before the circumstance is much regarded, or perhaps in spite of every attention. It will be right upon these occasions, to favour the opening of the abscess externally by poulticing and fomenting, and by watching for the time when an opening may with advantage be made, for evacuating the contents. When this is done, light dressings to the cavity, and poultice upon the part, will be commonly all that is necessary to favour its healing.

488. Should the abscess burst into the urethra, the sudden eruption of matter, with sudden relief from pain, and equally sudden disappearance of tumor, will demonstrate the fact. (463.) In this case, an elastic gum catheter should be passed into the bladder, and retained in its place, to prevent if possible, the urine getting into the cavity of the abscess. This instrument however, to answer its purpose, must be attended to from day to day. If rather too small, I have found it apt to permit the urine to escape by its side, and it then is both useless and inconvenient, conveying perhaps irritation, but certainly conferring no security; if rather too large, it may not only prevent the urine escaping by its side, but may also prevent the matter from flowing off, and the abscess unable to discharge its contents, will then be apt to extend itself, and do further mischief.

489. Where the parts are indisposed to healthy action, abscess may prove both tedious and troublesome. Under these circumstances, it may, in one case, be necessary to adopt a generous diet, to direct tonic and strengthening medicines, and use every means for increasing the energy, and restoring the powers of the constitution; and in another, expedient to promote the establishment of healthy action by laying open the cavity, or making a counter opening, dressing it daily, until healed. During this treatment, it will also be right, occasionally, to pass a full-sized bougie, that we may be assured there is no tendency to contraction in the urethra.

490. Where stricture already exists in the urethra, the obstruction having, perhaps, led the way to the abscess, the urine gets in, and urged on by the powerful action of the bladder, is generally driven into the cellular membrane, to some distance round, occasioning much tumor, and more mischief, the consideration of which will be reserved for a future occasion. (609.)

491. The irritation from gonorrhœal inflammation is occasionally transferred to the prostate gland, but this, I believe, never acquires the least importance, except from improper treatment. Where, however, this part becomes the seat of irritation, the means just pointed out (481.), for relieving any tendency to inflammation, must be had recourse to; after which, the judicious exhibition of anodyne and antispasmodic medicines, provided a gentle, yet free action of the bowels is kept up, will progressively alleviate the symptoms, and at length remove the complaint.

492. When from previous uneasiness there is reason to apprehend swelling of the testicle, the application of a cold lotion and a suspensory bandage to support the testicle, with aperient and other proper medicines (482.), will form the proper treatment.

493. Should the state of constitution be such as to excite any extensive sympathetic distress, with profuse discharge, I know of no mode of procuring relief so effectual as strict care to avoid fatigue, with the observance of a milk diet; confining the medical attention principally to the due regulation of the bowels, for the complaint will not on the one hand, bear the lightest tonics, nor on the other, endure the use of any means that favor debility, without aggravation. After some weeks it may, however, be right to make a cautious trial of some light preparation of steel, which, if it can be borne, may, towards the ultimate stage of such affection, be directed with the greatest advantage.

494. In one case of this description, considering there was no tension or inflammatory heat, I tried the effect of a mild astringent lotion externally applied, hoping to diminish the excessive discharge from the surfaces of the glans and prepuce; it, however, induced much additional irritation and pain in passing water, and was laid immediately aside.

495. Where an absorbent vessel, or a vein be-

comes inflamed, I am not aware that the principle of treatment should, in any material respect, be changed.

496. I have mentioned an instance, the only one I have ever seen in this country, of gonorrhœa falling upon a constitution predisposed to the most extreme effects of excessive irritability. In such cases I know of no means for checking the ill tendency of the habit, unless by restoring the strength of the constitution, by the most nutritious diet, and most powerfully tonic medicines, endeavouring at the same time to diminish the influence of high excitement, and excessive irritability by opiates, so administered as that their continued impression may be kept up in the system.

497. When gonorrhœa has been treated in the manner just described, it usually happens that in the course of a few weeks the inflammatory symptoms subside, the only remaining circumstance being a discharge from the urethra. Provided this symptom stands alone, and the constitution is disposed to assist, there will be no impropriety in directing medicines that may relieve, and by degrees remove the complaint. This, however, is so often attempted, either in a careless or a hasty manner, that with many the use of terebinthinate and balsamic remedies have fallen altogether into unmerited disrepute.

498. Sometimes, though very rarely, these medicines will, in whatever way directed, operate prejudicially; generally, however, they may with proper care, and in proper season, be so ordered as to expose the patient to no risk, while they afford him at least a chance of being cured of a most unpleasant disorder.

499. The single principle that I have found important in the use of these medicines, is to begin cautiously, keeping the bowels relaxed under their administration, and watching their effects upon the system, so that we may be enabled to lay them

aside in time, if they disagree. Sometimes they disturb the constitutional health, bringing out a copious eruption of red spots, in some instances small, in other cases larger, universally diffused, and somewhat raised above the surface of the skin. A few days' suspension of the treatment, a light aperient draught being directed in the interval, will, as far as I have seen, carry this appearance quite away, after which, the treatment may be resumed. Occasionally, these medicines excite an extremely unpleasant sense of constriction about the chest; this is either unimportant, or may require a suspension of the medicines, or prohibit the use of them altogether. These are the only constitutional effects I have ever seen produced by this class of medicines, when carefully administered; and as to the local symptoms of irritation, or other mischief that may arise under their exhibition, if such occur, these remedies should immediately be laid aside.

500. In addition to, or instead of the above means, I have in some cases succeeded in removing a discharge of very long standing, by the regular use of the cold bath; and in other similar cases, have been equally successful by the direction of chalybeate medicines, assisted by occasional aperients.

501. When the discharge gradually diminishes in quantity, ceases at length altogether, and does not re-appear within two or three weeks, I have been in the habit of considering the disease cured, having never witnessed its return. M. DESAULT however, observes that with regard to gonorrhœa, nothing can be more uncertain than the drawing a conclusion upon this point, for that after disappearing for several or many months, it may again return; and can only be considered cured, upon its having ceased spontaneously, as well as permanently.

502. Where, however, as sometimes appears to be the case, almost every means has been tried, without either success or benefit, I cannot help

feeling with M. DESAULT, that, "Il vaut mieux avouer aux malades l'impuissance de l'art, que de les exposer à être victimes de notre ignorance."

CASE 47.

Singular Complaints, consequent to Gonorrhœa.

A GENTLEMAN consulted me in *April* 1810. He said he was subject to a most distressing and severe pain, which generally occurred when he was upon the water-closet. The pain always came on at the instant when the motion was passing. The severity of the pain was frequently acute beyond all description; at times, it was productive of fainting, and it usually brought out a sudden and copious perspiration. The seat of the affection was invariably the same. It commenced at the anterior point of the sphincter ani muscle, and extended itself for some distance forward in the direction of the urethra.

These attacks, more or less severe, varied with the state of constitutional health. Any fatigue of body, but particularly any vexation in business, uniformly aggravated the complaint. This pain, however, was not productive of any material inconvenience in making water, nor did it ever continue beyond the space of a few minutes.

On enquiry, he was not able to attribute this singular complaint to any particular cause, unless it might in some way have been connected with a gonorrhœa, of which he had been cured about five years before. The discharge, at that time, had certainly been removed by an injection, and he very soon afterwards experienced the first of those attacks of which he still complained.

He had taken several opinions, and one medical gentleman had pronounced it to be the internal piles, while another soon afterward told him it was a stricture in the urethra. This complaint did not very materially interfere with his habits of life, but

he had of late found riding so frequently bring it on, that he had not been able to use his horse and chaise for the last six months. On examination the urethra was found very fairly and equally relaxed, a full-sized bougie passing readily forward into the bladder. The rectum was next examined, where there was no indication of hæmorrhoidal fulness; but on pressing forward to the prostate gland, which felt rather more distinct than ordinary, he started, and said I had now found the seat of his complaint, and had produced the pain which, as he described it, was neither situated in the intestine, nor the body of the gland, but in the old spot, anterior to the sphincter muscle, and extending about an inch forward in the perineum.

With a view to his relief, the compound tincture of bark was directed to be taken every morning, with an opiate in the evening, occasionally, or when the pain occurred; the shower bath to be used every day. He was requested carefully to avoid all such exercise as might tend to heat or disturb the parts locally, and to keep the bowels cool and regular. When the pain came on with unusual severity, he was desired to take a glass of hot brandy and water; a remedy which from its operating to his relief almost instantaneously, he placed more dependence upon than even his opiate. A large-sized bougie was also passed into the bladder twice a week, in order to favour the more complete relaxation of the urethra.

Under this treatment he improved; in the space of three months he was much better, and in about six months he had perfectly recovered.

SECT. XV.

On Retention, from Contusion of the Urethra.

503. INJURIES of the urethra, from external violence, though unusual accidents, are generally when they do occur, productive either of partial or com-

plete retention of urine. The part of the urethra most exposed to violence, in injuries of the perineum, lies so closely against the bones of the pelvis, that the consequence of bruise is generally laceration, and more or less of bleeding into the cellular membrane, or into the canal of the urethra.

504. Where the injury has not been attended with laceration of the urethra, the inflammatory tumor may be treated precisely in the manner directed upon any other occasion (481.), except that in the present case it will be necessary either occasionally to pass a bougie, or perhaps keep an elastic catheter constantly in the bladder, as long as there may be reason to apprehend the formation of stricture.

505. Where the injury is not very serious, there may still be so much irritation and spasm as to prevent the passage of an instrument. When the injury is more extensive and severe, the impracticability of introducing a catheter arises from its point becoming entangled in the lacerated part of the canal, which of course prevents its passing forward.

506. In one instance (Case 48.), where stricture followed from laceration of the urethra, the effect of the accident was a discharge of blood, soon mixed with urine. There is no doubt retention here was at first established, but fortunately a partial relief from the first effect of the injury soon permitted the bladder to keep itself so far clear as to render any further operation unnecessary.

A case of severe bruise of the perineum, attended with peculiar sympathetic complaints, is related by Mr. KINDER WOOD; where the injury was followed by great ecchymosis, and extensive sloughing of the scrotum, perineum, and urethra. On the 12th day the slough separated, and it appeared that the whole of the bulb and membranous part of the canal had come away. Catheters of silver or of elastic gum were kept in the bladder, the granulations closed round by degrees; the accident happened

Feb. 25., and the ulcerated part was completely healed on *July 4.* Very troublesome symptoms now ensued; the urine was not expelled through the urethra. He had a sensation as if the urine passed down to the penis, where the opening had been, then came on violent pains in the belly, rigors, and difficulty of breathing; these continued several hours, when the urine again dropped by the perineum. It then came in a small stream, and the opening having much enlarged, the bladder was emptied, and the symptoms went off. A full-sized bougie could be passed beyond the opening, but not into the bladder. Affections of this nature had come on, as the opening contracted, but not severe till it was quite closed. Since that time the opening having again become small, the urine passed through it with difficulty, attended with the same symptoms, but less in degree, as the opening did not entirely close.*

507. In another instance of this kind, which fell immediately under my own eye (Case 49.), the degree of injury to the urethra must have been great, as no instrument could be passed, which obliged me to puncture the bladder. The degree of tumor from the effusion of blood and urine into the cellular membrane of the penis, scrotum, and perineum, in this case was enormous, and the quantity of coagulated blood liberated upon laying open the tumor very considerable.

508. In another case of a similar description upon which I was afterwards consulted (Case 50.), a complete retention of urine not admitting relief by the catheter, it was found necessary to puncture the bladder; an operation that will be presently considered. (651.)

509. The other points of necessary treatment must in every case be regulated by the apparent extent and other circumstances of the injury. Should

* Edinb. Med. Journal, vol. iv.

the bruise have been extremely severe, the violence of pain, and rapid increase of tumor and ecchymosis, added to the peculiar feel of the swelling, will demonstrate the extensive effusion of blood and urine from the injured part of the urethra.

510. An early deep and free incision should in this case be made through the tumor, which by enabling the urine to flow off, may prevent any further increase of swelling. The bowels first cleared by aperient medicines, or laxative injections, anodyne remedies must be directed to allay pain and procure sleep.

511. Fomentations and poultice, diligently applied, will most beneficially promote the separation of the sloughs, bringing the injured parts into a clean and healing condition. Till this point is attained, the offensive state of the patient frequently keeps up much irritation and fever, and until the mortified parts are separated, and the seat of contusion a healthy granulating sore, it is scarcely to be expected that any attempt to introduce an instrument through the urethra into the bladder should succeed.

512. Fortunately there is very rarely any difficulty in keeping open the puncture made in the operation for relieving the bladder under these circumstances, for as long a time as may be required, even where the canula has been very soon withdrawn.

513. Where the process of healing is once established, fomentation and poultice laid aside, and light dressings of dry lint substituted, a large elastic catheter, occasionally changed, is to be retained in the bladder, and the patient kept quiet, till the parts are healed. After which, the occasional introduction of a bougie will for some months be expedient, to ascertain that there is no disposition to contraction in the urethra.

514. In general the elastic catheter is on every account the most easy and pleasant instrument for these cases, but sometimes it excites irritation, and

cannot be borne ; in these cases the silver catheter will be found to answer best, suffering the parts to heal quietly over it.

515. An instance of this kind of injury is mentioned by M. DESAULT of a postilion, who falling across the axle-tree of a carriage, received a severe contusion in the perineum. Great pain and a retention of urine was quickly followed by a rapidly increasing tumor on the seat of the injury, spreading to the penis and scrotum. Swelling to an immense extent had taken place, when he was brought into the Hôtel-Dieu, having voided no urine since the morning. The catheter was passed with ease, and the bladder emptied. M. DESAULT then made a deep and extensive incision along the perineum, down to the lacerated part of the urethra. The divided cellular membrane was filled with urinous fluid, and at the bottom of the wound, towards the urethra, were many large coagula. After the operation the parts were dressed, the patient put to bed, and kept quiet and cool. The next day the patient was rather easier, all the urine passing by the perineum. From the sixteenth day suppuration well established, the irritation from the wound much diminished, most of the urine passed by the urethra. By the twenty-ninth day, nearly all the urine flowed by the urethra ; but the reduced stream led to the passing of a sound, which stopped at the cicatrix, and a smaller sized elastic catheter would pass no further. The next morning a small silver catheter was introduced, and by moving the point in the manner of a drill, it was passed, though with difficulty, through the obstruction into the bladder. The catheter left in, was in three days replaced by one that being more curved, was more easily worn, although larger. On the next third day, an elastic gum catheter passed, and the patient was enabled to sit up. By the fiftieth day, the wound in the perineum nearly closed, the fistulous opening from the urethra quite healed over, no more urine passed

by the perineum. On the eighty-fifth day after the accident, instruments passing freely, and the urine thrown forth in a full stream, the elastic catheter was laid aside, and the patient left the hospital well.

516. Extensive sloughing of the urethra and vagina now and then takes place, in consequence of the pressure of the child's head, in hard labour. Mr. BARNES has given a case of this description successfully treated by the introduction of an elastic gum bottle into the vagina, with a small plate of fine sponge attached to that part of the surface opposite the urethra; a catheter being kept in the proper canal to prevent accumulation. By this means a constant pressure was kept up, allowing the passage of the urine by the urethra, but preventing its escape by the ulcerated opening. In five months the opening had entirely closed, and the patient had perfectly recovered her power of retention.*

CASE 48.

Retention, from Laceration of the Urethra, followed by Permanent Stricture.

A COAL-HEAVER, aged 64, applied to me for relief, Feb. 5. 1820, on account of stricture. He stated that in 1803 he was kicked by a horse upon the lower part of the front of the pelvis. The immediate consequence of the blow was great pain in the penis, and a dropping of blood from the urethra. There being neither external wound, nor ecchymosis, he walked to the Westminster Hospital, and was desired to keep a cooling lotion to the parts.

Blood, with urine, continued to drop away, and for a long time he had no power to pass his water in a stream, though he always got rid of it without assistance. By degrees, however, he recovered the

* Med. Chir. Trans. vol. vi.

power of retention, the consequences of the accident having never kept him from work.

In 1810, the usual stream of urine was equal to a knitting needle. A surgeon now introduced a small bougie, but found a stricture at four and a half inches, which he could not pass, and nothing more was done. By degrees, a desire to void his water frequently became an additional source of inconvenience, and when he first applied to me *Feb.* 1820, he said he was from this cause disturbed many times in the night. I could pass the smallest sized elastic bougie only four and a half inches, to a point just opposite the edge of the pubes, the seat of the original injury. He observed that beside the almost constant desire to pass his water, which was rendered difficultly, and scantily, he was distressed by severe pains at the loins, shooting down in the direction of the ureters towards the bladder. On consideration, I advised the application of caustic; he said he was anxious to have any thing done that might relieve his suffering, and I therefore, *Feb.* 5, passed down a bougie armed with the kali purum, which for the space of a minute was pressed against the stricture.

Feb. 8. The urine passed much more freely. The stream not materially fuller, but the act of voiding it very much easier since the application of the caustic. The emptying the bladder had always excited much pain and urgent bearing down at the loins and round the hips, but from the hour that the caustic was applied, the symptoms were relieved, and he passed his urine with as perfect ease as ever he did in his life. After this I saw no more of him till the 20th of the following *October*. On enquiry, he said the reason was, that although he did not void his water in so large a stream as when young, yet he had neither felt pain, nor difficulty, in getting rid of it, and was therefore perfectly satisfied and very thankful.

Oct. 2. 1821. Complained of difficulty and pain,

with desire to void his urine every quarter of an hour. He placed before me six ounces of healthy looking urine, at the bottom of which floated a quantity equal to one-eighth part of ropy, whitish, mucous matter. I ordered him a draught with ten grains of the compound powder of ipecacuanha, night and morning.

Oct. 6. At noon, I again applied the kali purum, as before; and from that time till eleven the next morning he could pass no water, though disturbed by incessant urging and straining, and notwithstanding repeated opiates, and anodynes; during the afternoon he had a shivering fit, which continued till six in the evening, succeeded by fever and delirium, which did not leave him till six the following morning. During this attack it was observed that the straining returned regularly every half hour. The feverish paroxysm was as usual followed by copious sweating, and the second day better, the third day he was well.

On the morning of the 7th, in the violence of straining, the pain shooting up the ureter into the left kidney, the water was at length forced out, with very great distress in the back and loins, and he became easier. For several years, as the pain at the back increased, his water had become more thick and cloudy, and had ever since continued to deposit more or less of a muco-purulent matter, which at present was copious, ropy, and attached like a yellow grass to the bottom of the vessel.

Oct. 20. By the warm bath every second day, and by the continued exhibition of anodynes, he was much improved in health, passing his water more freely, but less frequently. The pains at the loins and about the bladder entirely removed. The urine perfectly clear and healthy.

Oct. 28. He said he was as well now as at any time for the last twenty years. He had no pain any where, and passed his water easily two or three

times in the day, and as often during the night; he was therefore advised to lay aside medicine.

March 1823. This man remained in very good health.

CASE 49.

Retention, from Contused Urethra; relieved by Puncturing the Bladder.

ON the evening of Jan. 3. 1820, a person employed as a watchman, running in the dark, struck himself violently against a short iron post, over which he fell. Forty-eight hours after the accident he was brought into the house. The penis, scrotum, and perineum, especially the former, were enormously ecchymosed. Some leeches had been applied, when he was placed upon the table, to be relieved by the performance of whatever operation might be found necessary.

He suffered extreme pain from retention of urine, which had swelled the bladder into a tumor extending even above the navel. It was difficult to get a probe in between the glans and prepuce; and quite impracticable to find, through the ecchymosed tumor, the orifice of the urethra. The prepuce was therefore divided on a director, when a catheter passed readily enough three and a half inches along the urethra, and an ounce and a half of dark offensive urine flowed through the instrument. Whether this came from the bladder direct, or otherwise, could not be determined. It was, however, after many persevering attempts, ascertained that no instrument, small or large, could be got into the bladder, by the urethra; and it was consequently clear that the bladder must be very soon either punctured, or ruptured.

Upon passing the finger into the rectum, the sphincter ani was found contracting itself with more force than I had ever felt it; the extent of this muscle was also greater than usual, surrounding at

least an inch and a half of the lower end of the bowel. The tumid bladder was very prominent. With Mr. HEAVISIDE's kind assistance the canula of the curved trocar was introduced upon the finger, and having by this means fixed it steadily in the right direction towards the presenting tumor, the stilet was then carefully passed into its place, and I pressed the instrument gently forward into the bladder. More than three and a half pints of dark-coloured urine were drawn off, the canula secured, and the man greatly relieved, was carried to bed. Fomentations were diligently applied to the contused parts, and an opiate directed to be given every evening.

Jan. 10. Much local pain, and excessive general irritation. On exposing the parts, a large quantity of putrid blood, and sloughy cellular membrane was found to have partially escaped by a rupture of the tense integuments of the penis; a considerable mass of a similar description having made its way out on the preceding day. The integuments of the penis formed one, and those of the scrotum another, still more tense tumor. To relieve the "fire," of which he complained, I made a free opening with an abscess lancet in one of the most projecting and thin points, on the scrotum; from which an audible stream of putrid air, with fluid and coagulated blood, escaped. From the continued stream of florid blood, I was apprehensive some ruptured vessel was still bleeding; in the day, however, the hæmorrhage subsided. To relieve the dry and foul tongue, hot skin, and quick hard pulse, he was directed febrifuge medicines.

Jan. 11. Much easier and better. The parts unloaded, and the feverish symptoms relieved. He was, however, somewhat light-headed in the night. Little urine had passed through the canula in the rectum, most of it escaping by the side of the instrument into the bowel, exciting diarrhœa. The

canula was therefore withdrawn, the bandage removed, and his linen and bedding shifted.

Jan. 15. The tongue and pulse better ; the contused parts clear and clean. Passing a silver catheter by the glans, it now came out upon the surface of the healthy granulations, about an inch and a half along the canal, where apparently near an inch of the contused and lacerated urethra had sloughed away. On examining the posterior part of the ulcer, the opening in the centre of the granulating corpus spongiosum urethræ was discovered. The instrument went on immediately into the bladder, which contained a little healthy urine, the rest having passed by the rectum. The silver catheter withdrawn, one of elastic gum was now introduced and secured by a bandage, was left in the bladder.

April 11. The keeping an instrument perpetually in the bladder, appearing to excite some uneasiness and irritation, a silver canula adapted to the particular purpose, was inserted in its stead, and answered the intention neatly and exactly. The inner membrane of the bladder had latterly excreted a thick mucus, obstructing the eyes of the catheter ; that instrument laid aside, the urine in two or three days became perfectly clear.

April 12. He had entirely recovered his health, and the small remaining space of ulcerated surface being the only deficiency, the opening into the urethra having very nearly closed over the canula, he requested leave to return home to his own country, in Germany ; and was accordingly discharged.

CASE 50.

Retention of Urine, from External Violence, relieved by Puncturing the Bladder, followed by Sloughing of the Urethra, and Consequent Stricture.

A FIELD-OFFICER, on the staff of the peninsular army, met with an accident on duty, *Dec. 3. 1812.*

Ascending an old staircase, a part gave way, and he nearly fell through; bruising his perineum with violence, against the edge of a plank. Most acute pain was the immediate consequence. He felt constant and urgent desire to make water, but could only expel drops of blood. Tumor and inflammation were somewhat relieved by poultices and fomentations, but as no instrument could be made to pass the urethra, it became necessary to puncture the bladder. The operation was performed by one of the staff-surgeons, then on the spot; the puncture being made from the rectum, 48 hours after the accident. By the eighth day the bruised parts had suppurated, an abscess had formed and burst; an attempt now made to pass a silver catheter by the urethra at length succeeded. Unluckily the catheter slipped out of the bladder the next morning, and could not be again introduced.

In the course of the night, subsequent to the bladder being punctured, the canula somehow slipped out of the opening, and came away; the urine, however, continued to pass freely by the bowel, during the separation of the sloughing mass in perineo.

On the fourteenth day urine ceasing to pass by the rectum, there was a complete retention for two days; fortunately the slough then gave way, and a rush of urine came by the separated part of the urethra. In a few days more, the slough completely detached, left a clean and healthy wound.

A catheter was now introduced, and kept in. The instrument passed readily down to the ulcerated wound, but the point could only be conducted into the remaining part of the canal by watching the flow of urine. An elastic catheter first used, created such irritation, it was found necessary to substitute one of silver, which was occasionally removed and replaced to clean it. In six weeks the mass of granulations had closed round the instrument, and supplied entirely the deficient part of the canal,

which had sloughed off for the extent of an inch. The external wound very soon healed, he returned to his duty.

Some months afterward he reached England, and came to London; where a surgeon of eminence failing in an attempt to pass a small bougie, said the only mode was to clear the way with caustic. To this proposal, not choosing to submit, he took an opportunity of calling upon me. An elastic bougie one-tenth of an inch in diameter, passed with difficulty through a contraction at six inches. After remaining quiet three minutes, it excited uneasiness, and was withdrawn. The introduction of a flexible gum catheter he was rather averse to, from its having formerly made him always uncomfortable. A silver catheter therefore was selected, of a size rather exceeding that of the bougie; it passed with more ease, remained quiet a longer time, and was removed with less pain than the bougie had been. These circumstances naturally led me to believe silver instruments, in this case, were preferable to those of elastic gum.

The opinion I gave him was, that the application of caustic was unnecessary; for that the urethra seemed disposed to admit of the required dilatation, under proper management, upon much easier terms. A silver catheter, the eyes of which were made very smooth, was passed, and allowed to remain in the stricture a few minutes; till it created an uneasy feeling in one of the testicles. It was then withdrawn, he was requested to keep quiet for the day, suspend the testes, and take an anodyne at night.

Under this plan, the catheter was regularly introduced every second day. After a fortnight the instrument was changed for one a size larger, but as the eyes of the catheter had excited uneasiness in passing the prostatic part of the urethra, I had some silver sounds made, exactly resembling the catheter, but without any openings at the end.

These answered beyond expectation. The occasional uneasiness felt being now trifling.

Upon every increase in the size of the instrument, it was found necessary to direct rest, and an opiate. The neglect of these precautions, or the least irregularity in wine or diet, invariably put him back in his progress, obliging me sometimes to be content with passing a sound of a size smaller than that which had preceded it.

From an accidental neglect on one of these occasions, a swelled testicle came on, suspending the use of any instrument for three weeks.

By these means, the contracted part of the urethra was, in the course of five months, enlarged to a very adequate degree. The instrument that passed with ease at the end of this period, was seven sizes larger than that which passed with difficulty at its commencement; and was only two sizes less than a very full-sized bougie.

On leaving town, he was recommended to carry with him and pass one of the same instruments, every two or three weeks, to prevent the parts from again contracting.

I had the pleasure of hearing from this gentleman in *Feb.* 1816. He expressed some uneasiness at not being able to pass the same instrument he used when he left London; but as the next size smaller was very adequate for every purpose of security, he was advised to rest satisfied with passing it, and at the same time enjoined carefully to avoid bringing any excessive irritation upon the parts.

In 1819, I was favoured with a visit from my patient, who since his last leaving town, was married, and had a family. He stated that as to his local health little if any material change had taken place. He still occasionally introduced an instrument.

SECT. XVI.

On Retention, from Tumors in the Scrotum, Perineum, or Penis.

517. THE free passage through the canal of the urethra is sometimes interrupted by the pressure of tumor, situated in its vicinity. Any inflammatory swelling, collection of matter, extravasation of blood, or urinary calculus, lodged in the perineum or scrotum, may occasionally produce this effect. M. DESAULT observes, that the same consequence has been induced by enlargement of the testicle, hydrocele, scrotal hernia, or by an aneurism of the corpora cavernosa. A swelled state of the testicle, or hydrocele, operating as causes of retention from pressure, I should conceive to be extremely rare cases. I have seen exceedingly large herniæ without their producing any such pressure on the urethra as to induce retention; and in the only instances of this kind where I have observed retention (Cases 43. and 44.), it was evidently the consequence of sympathy with a strangulated state of bowel; and in neither instance did the quantity or situation of the rupture render it possible that it should operate to produce retention by pressure upon the urethra.

518. The formation of encysted tumors in the corpora cavernosa, is one of the least frequent causes of pressure upon the urethra; but this does now and then occur. A man came into the Westminster Hospital, under Mr. WATSON, with a tumor in the penis, having very much the feel of a stone in the urethra. A year and a half before, he had felt a hardness, which, gradually growing larger, had, within the last half-year, prevented his passing urine freely; and now his water was voided by drops only. On introducing a catheter an obstruction was perceived, beyond which it would not pass; it felt much like a stone.

It was extirpated, and proved to be an encysted tumor, within the theca of the left corpus cavernosum penis; pressing in towards the urethra, and almost totally obstructing the canal.

The operation was nice, and afforded a proof of exquisite sensibility in the theca, contrary to the general opinion of ligamentous and tendinous structures. After the first dressings were removed, some water passed by the wound, but most flowed in a large full stream from the urethra. The wound healed fast, the urine passing freely and entirely by the urethra; he was very soon well. *

519. Whatever may be the nature of the cause of pressure, should its removal be attended with delay, it will be necessary to avail ourselves of the assistance of the catheter; should the state of the parts be such as to admit of its easy introduction, it will be unnecessary to keep it in the bladder, as it may be passed at stated and convenient intervals.

SECT. XVII.

On Retention, from Enlarged Prostate Gland.

520. THE prostate gland is a soft body, in figure resembling a chesnut. The functions are important in the economy, as connected with those of the other organs, subservient to generation; but its principal consequence appears to arise from its situation. Placed at the neck of the bladder, it surrounds, and embraces, the canal of the urethra; and although this circumstance is productive of no inconvenience, while the parts continue healthy, it becomes an endless source of difficulty to the surgeon, and distress to the patient, when this gland is affected by disease.

521. In a former essay upon this subject, I remarked there was little variety in the diseases of the prostate gland, as most of the appearances ob-

* From a MS. of Mr. WATSON'S, in Mr. HEAVISIDE'S Museum.

served may be referred rather to various stages of advance in one and the same disease, than to the progress of affections, specifically differing, one from another. It appears, however, to be, in some points of view, better to adopt the arrangement of M. DESAULT; considering enlargement of the prostate gland as dependent on inflammation, abscess, calculi within its substance, a varicose state of its vessels, or a scirrhus disease of its substance.

522. Inflammation of the prostate gland is sometimes an acute affection, marked by a sense of heat and weight in the perineum, a constant or pulsating pain at the neck of the bladder, and most fatiguing tenesmus. The tumid state of the gland has, by some writers, particularly M. PETIT, been stated to modify the form of the solid matters passed by stool; but the subsequent action of the sphincter muscle, in compressing the fæces, has always appeared to me to render such appearances fallacious.

523. When the patient attempts to pass water, it is slow in coming, and if induced to make repeated efforts, the difficulty is increased, by the enlarged part of the prostate gland being pressed against the neck of the bladder, thus closing up the opening of the urethra. If a catheter is introduced, it passes freely to the prostate gland, where obstruction is felt, the passing which excites extreme pain. These local circumstances are attended with fever, quick and hard pulse, and thirst.

524. These affections are sometimes induced, where, from injudicious treatment, the irritation and discharge in gonorrhœa have been repelled, and the mucous membrane, lining the neck of the bladder and prostate gland, have become affected. It gives rise to a peculiar obscure pain in the seat of the prostate gland, with an uneasy sense of weight at what the patient occasionally describes as the root of the urethra. On examining, per anum, the gland will usually feel rather full, tumid, and tender,

when pressed. In passing a motion, also, this tenderness is sometimes productive of a shooting pain, darting up the gut, with urgent tenesmus.

525. Affections of prostate gland, from gonorrhœa, are not common, and when they do occur, they are so transitory, as to afford, in my opinion, no good ground for presuming that they ever lay the foundation for subsequent disease in that part. Where, however, disorder becomes complicated, and perhaps from injecting for gonorrhœa, irritation is excited in the neck of the bladder, and prostate gland, with severe and extensive inflammation in that part of the urethra which was the original seat of the clap, one of the worst kinds of stricture may be the immediate consequence; and the difficulty in expelling the contents of the bladder will then unavoidably keep up the disturbed state of the prostate gland, and in this way lay the foundation of future disease.

526. In one instance, I found a very singular affection of prostate gland, already noticed, the consequence of using topical applications for the cure of gonorrhœa. It was a species of peculiar irritation, connected with spasmodic action of the muscles surrounding the bulbous part of the urethra. (Case 47.)

527. Frequently, in retention from this cause, the bladder filling to a certain point, the urine afterwards secreted, flows off from time to time by the urethra, a state that may sometimes continue very long, without inducing any serious accident, or even exciting much attention.

528. The activity of the treatment, in this as in other local inflammations, must keep pace with that of the symptoms, to ensure its terminating by resolution. Bleeding, leeches, baths, fomentations, &c., aided by proper medicines, are the means principally to be relied upon.

529. As, however, retention will rarely be prevented coming on, the introduction of the catheter

will generally be required; and whether this instrument be of elastic gum, or of metal, there may be much difficulty in getting it into the bladder. The prostate gland cannot become enlarged, without pressing the sides of the urethra together, increasing the length, and deranging the course of the canal; for which reasons, the instrument preferred in these cases, should be rather larger, longer, and more curved, than ordinary.

530. Where the point is kept in a right direction, the instrument in skilful hands will be in little risk of forcing a false passage, even though the catheter be pressed forward with considerable firmness. The grand point is, to be perfectly acquainted with the exact direction of the point of the instrument, and the natural course of the canal, making the point of the instrument pass close round the symphysis pubis, keeping it clear from the posterior part of the gland, till it has fairly reached the bladder. Should the difficulty of introducing the catheter prove extreme, the danger of creating a false passage, in making way into the bladder, may be so considerable, as to render it preferable to perform the operation of puncturing the bladder; in which case, the canula will not require to be retained long in the bladder, particularly as the speedy reduction of the tumor will probably soon admit the introduction of a catheter, by the urethra.

531. Although it must always be a principal care to avoid injuring the prostate gland, observation has frequently led me to favour Mr. HEAVISIDE's opinion, that this part may sometimes be made very free with, having known many instances in which accidental injury has induced no obviously unfavourable change in the symptoms. In one instance, that ended fatally, the immediate cause of death was evidently peritoneal inflammation, in consequence of gangrene, and rupture of bladder (Case 56.); while, in another, the great length of time the patient afterwards lived, and the state of

the parts after death, were such as to afford a strong presumption that the event was not hastened by the accidental rupture of the gland (Case 61.); and the appearances I have seen in examining preparations of these diseases, have generally led me to a similar conclusion.

532. Where the operation of puncturing the bladder has been required, and performed, it may be matter of doubt whether the best practice is in favour of having an instrument occasionally introduced into the urethra, or not. I am myself decidedly in favour of leaving the parts entirely to themselves, for some time at least. M. DESAULT, however, observes, that “*Ici, tout précepte général est d’une application difficile.*”

533. Should inflammation pass on to suppuration, this process not always established in the substance of the prostate gland, sometimes takes place in the surrounding cellular tissue, or in the cellular membrane connecting its lobes; although frequently the gland itself is converted into an abscess, either with or without the destruction of the principal part of its natural structure. M. DESAULT states that where he has found considerable deposits of pus, they have almost always been situated external to the gland, either towards the bladder, or between it and the rectum.

534. The continuance of the symptoms of inflammation, after the first week, will determine the probability of suppuration, and any suspicion of this result will be much strengthened, if the patient complain of feverish heat, preceded by chills, coming on towards the evening; but although these circumstances may indicate a formation of matter in or upon the prostate gland, they afford no precise information as to the exact seat, or extent of the abscess.

535. Some excellent writers have observed that where the collection of matter is external to the gland, the prospect is better than where its sub-

stance becomes the seat of abscess ; but it appears to me that when this part is once involved in disease, its deep situation is such as to render all precise notions of its condition so speculative, that although the importance of the complaint may be great, the practical value of any nice adjustment of opinion, as to the exact condition of each part of the gland, will be extremely small.

536. Where extensive abscess has formed within the substance of the prostate gland, the matter sometimes makes its way out with considerable difficulty ; under these circumstances a catheter introduced for the relief of retention of urine, has occasionally, by accident, ruptured its parietes, and made a way for its escape. Sometimes a similar opening either into the canal of the urethra, the cavity of the bladder, or even into the rectum, is formed by the spontaneous extension of the ulcerative process. Should the deposit have formed between the bladder and rectum, so as to admit of being clearly felt by the finger, M. DESAULT considers that an opening made into its cavity from the bowel will be advisable, and materially favour the healing of the abscess, and consequent recovery of the patient.

537. Should the situation and peculiar state of the abscess have led to its accidental rupture in passing the catheter, the point of the instrument becoming entangled in the opening, may cause embarrassment and delay in reaching the bladder. To avoid this inconvenience, the suggestions already laid down (530.) must be borne in mind.

538. Not very unfrequently, in the examinations of these diseases after death, small calculi are found in the prostate gland, sometimes in considerable number ; I have never found them occur under such circumstances as to lead to a suspicion of their having produced retention of urine ; M. DESAULT, however, remarks that retention does arise from this cause. These calculi, generally small, seldom ex-

ceed the size of a pepper-corn; but they have been found as large as a cherry. In some instances it has appeared probable that these calculi have dropped accidentally into this situation in escaping from the bladder; but in others, the peculiar porcelaineous polish that occasionally gives them the appearance of small pearls, independent of analysis, would argue a difference in composition between these and the more ordinary kinds of urinary calculi. (154.)

539. Calculous substances are now and then formed within the substance of the prostate gland, after the operation for lithotomy, from the external wound healing before the deeper seated part of the opening has united, where the urine depositing calculous particles and thickened mucus, the formation of a stone of considerable size has been the result.

540. Occasionally calculus in the prostate gland presents a small part of its surface exposed towards the urethra, and a catheter in passing into the bladder is then pretty sure of detecting the existence of a stone; although its exact seat is not so easily determined. It may be contained in a sac within the substance of the prostate gland, or in a sac immediately connected with the bladder, or it may be lodged in the neck of the bladder.

541. Where by the catheter, the existence of calculus is ascertained, whether situated in the prostate gland, or in the neck of the bladder, it has been held necessary to perform the operation for its extraction, because in either case it will enable the surgeon to remove the stone. Provided, however, the calculus is seated in the prostate, there will be so much uncertainty as to there being one stone or many, and so much doubt as to the measure of advantage the patient may derive from its performance, that unless symptoms urgently pressed for its removal, I should, in most instances at least, defer the performing or recommending an operation.

542. A frequent cause of affections generally

attributed to the prostate gland, and sometimes productive of retention of urine, is a varicose enlargement of the veins that pass over its surface from the neck of the bladder. That varicose veins sometimes give rise to symptoms and consequences irksome and distressing, is abundantly proved by observation. (Case 30.) I have, however, never seen them project into the cavity of the bladder, although M. DESAULT says, "*Souvent il présente des espèces de nodocités saillantes dans le col de la vessie, et semblables à celles que forment les varices situées dans les autres parties du corps.*"

543. In this complaint, the change does not consist so much in enlargement of the substance of the prostate gland, as in those appearances incident to hæmorrhoidal tumors. One principal circumstance tending to induce this effect of local weakness, has been stated to be habitual confinement of bowels, and frequent efforts to pass a costive motion; the most frequent cause, however, is, as far as I have observed, of a different nature, although productive of the same effect in favouring local congestion. (293.) It does not appear that a varicose state of the vessels about the prostate gland can be easily distinguished; at least I have never during life been able to discern it, in any clearer light than that of conjecture.

544. The introduction of the catheter when necessary, should be managed with all possible caution; a large catheter of elastic gum being preferred, as requiring to be left in the bladder.

545. Where the obstruction cannot be at once overcome, a number of bougies may be passed in succession, each being larger than the former, and retained some hours, by which the passage may sometimes be eventually opened. An advantage in the catgut bougie is, that as the moisture is absorbed from the urethra, the instrument swells, and when withdrawn, the next is introduced with more facility.

546. Should hæmorrhage from the accidental

rupture of a vessel in the urethra occur in introducing the catheter, the symptoms are rather relieved than aggravated; suggesting the benefit sometimes derived from local blood-letting, by cupping and leeching.

547. It has appeared to me, that the wearing an elastic catheter would operate to the relief of this state of parts by the pressure thus kept up; M. DESAULT, however, considers the benefit to arise more from a degree of inflammation excited by the irritation of the instrument, tending to unload the vessels, by inducing a purulent discharge from the urethra, and gradually obliterating the enlarged vessels; while the instrument being retained in the bladder, secures a free passage for the urine from that cavity.

548. The scirrhus induration of the prostate gland is not an uncommon cause of retention in old age, and until this period of life it is never known to take place. In consistence the prostate gland in this complaint varies, sometimes being comparatively soft, at others hard as cartilage. The magnitude also varies extremely; the enlargement in some instances scarcely perceptible, is in others extremely obvious. I have one patient at the present time, in very good general health, in whom the prostate gland may be felt pressing into the rectum, at least equal to the size of a large orange. In Mr. HEAVISIDE'S Museum are several specimens, that are very nearly of this magnitude.

549. In some instances, the first symptom of this disease is some degree of impediment in passing water, increasing more or less quickly in proportion to the growth of the disease, till eventually the flow of urine is altogether prevented. In other cases the symptoms are from the first connected with some degree of irritation at the neck of the bladder, the frequent necessity for voiding the urine, and the difficulty in passing it, aggravating the severity of the complaint.

550. The secretion from the enlarged prostate

gland is usually much increased in quantity (106.), becoming tenacious and ropy ; the urine in which it is contained throwing off an offensive odour, and passing quickly into putrefaction.

551. Should the impediment to the expulsion of urine be considerable, the coats of the bladder, having to overcome preternatural difficulty, are under the necessity of making increased exertions, and the muscular coat thus acquires considerable increase of strength and thickness, while the cavity of the bladder is in the same proportion diminished, similar to what happens in stricture in the urethra.

552. When the case becomes complicated, and to enlargement is added irritation, the frequency and urgency of straining aggravates every symptom, till at length a violent degree of inflammation in the mucous membrane of the bladder sometimes takes place, which in its turn becomes a cause of still increased irritation ; and the efforts at contraction, rapidly increasing on the one hand, the congestion and disturbance in the prostate gland, seldom fail on the other in extending the inflammatory action to the muscular coat of the bladder ; a change that usually ends in a permanent consolidation of structure, and diminished power of expansion.

553. Where either from this or any other cause, the difficulty in expelling urine is considerable, a diminution in the quantity of urine secreted very commonly takes place. This circumstance has been regarded as arising from the free passage of the secreted fluid being checked, by which the contained urine keeping up a degree of pressure within the kidney, the process of secretion is frequently retarded, and sometimes suspended ; as happens from the irritation of calculi in the kidneys. (27.)

554. The inconveniences resulting from this arrest of secretion will be extremely various, dependent on constitution, degree of obstruction, and the quick or slow progress of the disease. Should the disease move on slowly, the consequent pres-

sure within the kidneys increases very gradually, and these glands will then be found to possess a power of adapting themselves very wonderfully to the difficulties under which they are placed; the whole fabric of the kidney becoming more or less expanded by distention. (60.) But should the rapid progress of the disease bring on early and complete retention of urine, the resistance from the full bladder preventing more fluid flowing in by the ureters, a pressure is induced, the occasional consequence of which is a sudden and complete arrest of secretion; and unless this pressure is removed by the timely introduction of an instrument to empty the bladder, the kidneys soon become incapable of renewing their functions, and the patient sinks into a state of coma, terminating fatally.

555. As a complete retention of urine is one of the most common, and sometimes most early symptoms (Case 51.), it becomes necessary to consider the kind of catheter that under these circumstances will answer best. M. DESAULT, who admits the occasional difficulty of the operation, prefers a small to a large-sized instrument, as more likely to evade opposition. I have, however, in these cases, tried all kinds and sizes, and cannot help feeling a decided preference to the recommendation of Sir E. HOME, who always selects one of the largest dimensions. In some instances a very large silver catheter, in others one of elastic gum upon a stilet, or perhaps one of the soft metallic instruments, will be most easily made to pass into the bladder.

556. A catheter or bougie frequently passed by an unskilful hand, or by the patient himself, is sometimes found to lose the right direction of the urethra at its curvature, pressing for some time obliquely, produces a degree of depression, pushing the inner membrane of the urethra before the point of the instrument, and raising it into a transverse ridge. Thus a slight depression becomes a cavity, and the cavity a tube, which according to circum-

stances, may in time lead out from the posterior part of the urethra towards the rectum, or pass along in a line parallel to that of the natural canal. Should this accident occur in the prostatal part of the urethra, the false passage may take its course through some part of the substance of the prostate gland (Case 61.), or as in the other part of the urethra, form a passage parallel to the proper line of the canal, and passing between the substance of the prostate gland, and the membrane covering it. I was some years since requested to open the body of a physician, long subject to strictures, for which he had himself passed bougies, and had produced two false passages. One of these, anterior to the verumontanum, passed obliquely out for the extent of one-fourth of an inch, forming a cul de sac; the other, situated higher up, passing between the substance of the prostate gland, and its inner membrane, to the extent of five-eighths of an inch, again opened into the cavity of the bladder.*

557. Where the urgency of symptoms has required immediate relief, the obstruction absolutely preventing the introduction of the catheter by gentle means, it has sometimes been held advisable to accomplish this purpose by force. In some cases this has been done, and a practicable passage has remained for the future passage of an instrument without any apparent ill consequence. In one such instance, however, a very excellent anatomist, performing this operation, at the earnest entreaty of his patient, passed the catheter through the body of a very vascular and irritable fungus that had sprung up from the internal surface of the diseased prostate gland. The patient, instantly thrown into the most excruciating agony, survived only half an hour. This, however, was one of those accidents quite impossible to be provided against; and supposing for a moment that the surgeon could

have been previously and perfectly acquainted with the state of the disease, and had punctured the bladder in any other way, he could only have lengthened out for a few days, or perhaps a few weeks, a wretched existence.

558. In one instance, mentioned by Mr. HUNTER, a catheter was pushed through the substance of a diseased prostate gland, hæmorrhage into the bladder took place, and a large coagulum forming in that cavity, prevented the urine passing off when the catheter was introduced, and the patient died. Persevering endeavours have, however, sometimes succeeded in removing these consequences of hæmorrhage into the bladder. (83.)

559. Should the enlargement and excitement of the prostate gland be considerable, the quantity of its secretion may be so much increased as even to create a difficulty in voiding the urine. The urine, received into a tumbler, the diseased secretion from the prostate forms a transparent colourless deposit, sinking at once to the bottom, which stirred up is ropy and tenacious like the white of egg; frequently this matter forms one-sixth of the contents of the bladder.

560. The treatment, independent of what relates to the use of the catheter, will in the early stages require the means pointed out for the relief of inflammation (485.); as to the rest, the remedies already mentioned as useful in alleviating irritation and disease of bladder, will in the present case be equally necessary and useful. (312.)

CASE 51.

Retention of Urine, from Enlarged Prostate.

A HEALTHY sea-faring man, aged 58, left Sunderland about noon, *August 2.* 1808, at which time he made his water well as ever. Two hours after, he tried, and could not pass a drop. He remained in this state till next morning, when his vessel reached Scarborough.

The moment the anchor was down, he came

ashore, and his surgeon tried to pass catheters, silver and elastic, and bougies, but failed. On the evening of the 5th I first saw him, and found the bladder full, tense, and extremely painful. He had lost eight ounces of blood, taken repeated opiates, been immersed in the warm bath, and had embrocations to the belly. It was stated there was an obstinate stricture, and it was proposed to puncture the bladder. During the forenoon he said a little water had dropped away, but soon ceased. He was in extreme pain, the bladder forming a very prominent tumor above the pubes.

It was determined in consultation to make one more attempt, previous to puncturing the bladder.

Both the attendant surgeons failing, they requested me to try. The silver catheter, of middling size, passed so freely along to the prostate gland, it appeared to me stricture had nothing to do with the obstruction. Under this impression, the direction of the point of the instrument was occasionally varied, keeping it close up behind the arch of the pubes. In this way the point in a few minutes was felt to slip over an elastic projecting point of the tumor, passing at once into the bladder. Seven pints and a half, by measure, of urine were drawn off, to the infinite relief and comfort of the patient.

The same evening the attendant surgeons tried, but failed, to introduce the catheter. The next morning he sent to request me to pass the instrument for him, as he was going out of town. Subsequently the patient entreated me to pass the catheter regularly for him. Examining by the rectum, the prostate gland was felt considerably firm and enlarged.

After the first ten days the silver was exchanged for the flexible catheter, passed on an iron stilet. In the beginning of *September* his health was fast improving, and as he was very anxious to go to sea again, I took some pains to teach him to pass the catheter for himself; although with the hand of a sailor he at first acquitted himself awkwardly. To-

wards the middle of the month the urine began again to flow off by the natural efforts, at first seldom, and in small quantity; but as he improved, the natural powers perfectly returned. On repeating the examination, the enlargement of the prostate gland had nearly subsided, and on the 27th the catheter was finally laid aside, and he returned to his ship.

CASE 52.

Retention of Urine, from Enlarged Prostate Gland.

September 24. 1817. I assisted a professional friend, in examining the body of a man, aged 44, who had laboured under aneurism of the aorta. About two months previous to his decease he complained of pain, frequent desire and difficulty in voiding his urine; and in two or three days more entirely lost the power of passing his water. The catheter on the following day brought away near two quarts of healthy urine; but the difficulty in voiding it still remained, though sometimes partially relieved by opiates. The catheter regularly passed, the urine was observed occasionally tinged first with blood, then with filmy coagula and purulent matter, so as to impede the escape of urine through the instrument. Latterly, difficulty experienced in its introduction, suggested the propriety of leaving the catheter in the bladder.

In the examination of the body, the membrane lining the pelvis of the left kidney, was found thickened and covered with a fluid, between the consistence of pus and mucus. The right kidney was affected in a similar way, but to a less degree; its ureter was of a dark red colour, the inner membrane being extremely vascular.

The bladder, neither contracted nor thickened, contained some purulent fluid, similar to that passed; with shreds and thin expanded films of coagulable lymph, of a yellow pulpy texture, some as large as a sixpence. Several of the smaller

shreds were still adhering to points of the surface from which they had been effused. It appeared probable that the whole of the lymph had been thrown off by the mucous membrane lining the bladder; which exhibited many dark spots, from clusters of small vessels of a grey colour.

The prostatal part of the urethra, highly vascular, had a large ragged opening communicating with an abscess within the cavity of the prostate gland, which was considerably enlarged.

In the above case, it appeared most probable that the affection of the prostate gland had taken the lead, and going on to suppuration had thus induced spasm, and retention of urine; and that the abscess having burst, the matter not able to make its way forward, had flowed into the bladder, bringing the surface of that viscus into the disturbed state in which it was found.

CASE 53.

Retention of Urine, from Diseased Prostate Gland communicating with the Rectum.

A LABOURING man, aged 35, was admitted into the infirmary *Feb.* 1815. He said that in 1800, he had been long employed carrying heavy loads, which he supposed too great for his strength, as he found his loins give way very much, and he sometimes perceived a diminished power of retention.

In 1806, he was confined many weeks by a venereal chancre and gonorrhœa; for the one complaint he had used mercurial frictions, for the other injections. The injections had very much aggravated the frequency, pain, and difficulty in making water, and these symptoms gave him much distress for many months after, although in other respects his health was in due time restored.

In 1810, an abscess formed in the perineum. Obligated to walk twenty miles a day, in hot weather, he thought produced the inflammation, which

obliged him to keep his bed; the swelling was poulticed, fomented, broke, and became easy. Although with difficulty, he generally was able to get rid of his water; a very small bougie would not at this time pass, because of stricture. In the course of a month the abscess healed, but within a twelvemonth, owing to a fall, the cicatrix gave way, and urine again oozed from the perineum, and from this time generally passed as freely by the wound, as by the urethra.

In 1815, a fresh attack of inflammation came upon the perineum; during the violence of which attack, for nearly a month, very little urine passed by the urethra. When the abscess broke, a large discharge of offensive matter was followed by a free flow of water. The fistulous opening, not far from the anus, was found by a probe to extend itself forward in various directions towards the scrotum, and bones of the pelvis.

For several weeks his health was much on the decline, apparently owing to the excess of unhealthy and foetid discharge. The bowels, always disordered, were sometimes too costive, but more frequently too much relaxed. In *April*, as the proportion of urine voided by the urethra still diminished, another attempt was made to pass a bougie, but the smallest was stopped within half an inch of the orifice. He had been repeatedly advised to allow proper means to be adopted for removing the obstructions in the urethra, but he could not now be prevailed on to admit of any thing more being attempted for his relief. Towards the close of the month, with repeated attacks of diarrhoea, constant tenesmus, and much pain, he had frequent watery motions, apparently urinous. His appetite now so completely failed, he could take no support whatever. Under this accumulation of distress he continued to struggle, till *May 9*. when he died.

Several fistulous openings in perineo, led to a space covered by diseased integuments. The cel-

lular membrane surrounding the abscess, loaded with effused lymph, was converted into a consolidated mass, like gizzard, and full of sinuses burrowing in every direction.

On laying open the urethra, the external stricture near the orifice was somewhat relaxed, but from this point to the extent of two inches and a half from the external opening, the diameter of the canal was much diminished. The urethra had at this part suffered from violent inflammation; and extensive effusion of coagulable lymph, into the cells of the corpus spongiosum, had produced an unusual and permanent firmness of contraction in the canal. The inflamed part of the membrane lining the urethra was contracted, thickened, and of a more firm texture than natural, still retaining in some degree the inflammatory blush.

At the bulb of the urethra was a firm stricture, so closely contracted that it was scarcely possible in the relaxation of dead parts to pass a silver probe, no larger than a bristle, through it. This stricture was only one-sixth of an inch in extent.

Finding the rectum and bladder closely adherent, a part of that intestine had been dissected out with the disease. The inner membrane of the gut was of a very unhealthy colour, and where it was adherent to the prostate gland, had somewhat of a fungated appearance; more closely examined, an opening was at this part found, by which a probe passed from the cavity of the bowel, into a large abscess within the substance of the prostate gland.

The fundus of the bladder, divided by a longitudinal section, discovered a small abscess, full of thick healthy looking pus; seated between its peritoneal and muscular coats. The parietes of the bladder were much thickened, its cavity much diminished, and its inner membrane of a lurid colour, and highly vascular.

The abscess in the prostate gland contained a thick, brownish, yellow matter. Some parts of the

cavity had a fungated appearance, while others had formed little recesses, in which were lodged a considerable number of small rounded calculi. Some of these calculi were of a dark-brown colour, but others, when dry, had the colour and polished appearance of small pearls.

Between the stricture at the bulb, and the neck of the bladder, were several fistulous openings, leading out from the urethra; some of these connected with the abscess in the prostate gland, and consequently with the opening into the rectum, and others communicating with the fistulous passages in perineo. *

CASE 54.

Retention of Urine and Ulcerated Bladder, from Diseased Prostate Gland.

A GENTLEMAN, about 50 years of age, had been long subject to enlarged prostate gland. The inconveniences to which this at first gave rise, were, as generally happens, only occasional. As the complaint increased, the necessity for having recourse to the catheter increased with it, added to which the operation itself, at first easy, became one of difficulty. In the course of time his health gave way, he lost all power of expelling his urine, and was confined at first to his room, and then to his bed.

While lying in this state, the catheter passed regularly, he one day felt pain come on in the lower part of the abdomen, quickly increasing to intolerable severity, and producing screams, groans, and delirium. These pains, in spite of every means for the relief of inflammation, continued to increase. Upon introducing the catheter as usual, the bladder was now found for the first time empty.

The severity of the above attack continued for

* See PLATE IV.

twenty-four hours only, when drowsiness and coma supervened, which in twelve hours more terminated his existence. On the following day I was requested to examine the body.

On laying open the abdomen, an effusion of purulent matter and coagulable lymph was dispersed among the small intestines, and in the cavity of the pelvis. On the peritoneal coat of the bladder were several shreds of adherent lymph; by several of these the bladder was connected to the peritoneum above the pubes. Pressing the bladder, a jet of urine sprung from a point upon its surface; here a small hole was found, by which a probe passed at once into its cavity.

It was thus apparent, that the immediate cause of death had been peritoneal inflammation, caused by the escape of urine into the abdomen, through an ulcer in the coats of the bladder. This conclusion was borne out by the state of the inner membrane of the bladder, upon which were several small ulcerated spots, though only at one point had this process extended itself to the peritoneal coat.

The prostate gland, much enlarged, was the seat of a considerable abscess, which had extended itself by forming sinuses for some extent beyond the limits of the gland, burrowing between the diseased and thickened coats of the bladder.

Several duplicatures in the membrane lining the prostatic part of the urethra were observed. The deepest depression extended one-eighth of an inch out of the course of the natural canal, an extent quite sufficient to have given a complete false passage, had any instrument been incautiously pushed forward in that direction. These folds, all situated on the posterior part of the urethra, might have been avoided by an instrument having sufficient firmness and curvature to allow of its being kept in contact with the superior and anterior part of the canal in its way into the bladder.

CASE 55.

Retention, from Enlarged Prostate, relieved by Puncture of the Bladder.

IN the early part of *June* 1820, I was requested to visit a gentleman, between 60 and 70 years of age. He had a severe paralytic attack in *August* 1818, which was soon followed by a retention of urine, which on the first occasion admitted a catheter; but on its return soon after, obliged Mr. ABERNETHY to puncture the bladder, as it was impossible to get any instrument through the urethra. The integuments covering the linea alba were first divided, and the bladder then punctured with a trocar. A few days after the operation, the right passage was found, and a catheter from this time kept in the bladder by the urethra. It was, however, many months before the opening made by the trocar closed, and the urine occasionally escaped by it even after it had apparently healed.

His complaints to me were principally of pain in the region of the prostate and bladder, and more especially at the glans, with frequency in making water, and most severe pain at the close of the act. The pulse was natural, but the tongue furred. I found the prostate gland much enlarged and very tender, examined by the rectum; but a large silver catheter passed readily by the urethra, although the tumid gland was felt in traversing the prostatal part of the canal.

Unfortunately, the relief which in this case might have been derived from the use of proper medicines, was prevented by the unhappy and perverse temper of the patient. Mr. ANDERSON, who attended with me, paid him every attention; but however urgent the symptoms, the effect of remedies could never be calculated on, as he always did what he pleased, and rarely what he was directed.

Towards the end of the month the tongue as-

sumed the typhoid state; he gradually sunk, became comatose, and died. Unfortunately, leave could not be obtained for examining the state of the bladder.

CASE 56.

Retention, from Enlarged Prostate, relieved by Puncture of the Bladder.

A ROBUST man, aged 75, requested a surgeon to visit him, *November 14, 1817*. On the previous day he had voided a large quantity of urine, but from that time not a drop. His apothecary, who had seen him on that day, had attempted to introduce instruments to no purpose; and when his surgeon arrived, he found him bleeding profusely from the urethra. Every endeavour to pass an instrument again failed; he was therefore directed the warm bath, an aperient draught, and anodynes.

November 15. 10 A. M. The full and painful bladder was felt high up in the abdomen, the opening medicine had operated, but no urine flowed, nor could any instrument be got into the bladder. Very severe pain in the seat of the bladder now came on, and considering that he had waited long enough, his surgeon passed a finger into the rectum, and found a very enlarged prostate gland, extending nearly as far as the finger could reach, and beyond this a very distended bladder, which pressed the sides of the rectum together, explaining the failure of several attempts to throw up an injection.

The bladder was punctured by the rectum, and two full quarts of a chocolate-coloured extremely offensive urine were drawn off by the operation. An elastic catheter, introduced through the curved canula of the trocar into the bladder, the canula was removed, and the catheter secured to a proper bandage; the patient was put to bed.

November 16. About half a pint of dark-coloured urine had passed by the sides of the catheter. He had passed a tolerable night, was comparatively free

from pain, and took nourishment. Towards evening the urine again passed freely by the sides of the catheter, but on removing the peg none flowed through the tube.

November 22. Little urine having passed through it, the catheter was withdrawn. The same evening increased pain and tension of the abdomen coming on, some leeches were applied to the region of the bladder.

November 24. The local pain much increased, not a drop of urine now passed either by the bowel or the urethra. The distress and tenderness above the pubes continued to become worse; towards evening he sunk, and on the following morning died.

While the bladder was full, the pulse was strong and hard, at 90; after the operation it became weak and low; for some days prior to his decease, running on to 130 in the minute.

I was requested to examine the body, which was to an unusual degree loaded with fat. The contents of the pelvis were first dissected out, to render the exact state of the disease more clearly demonstrable.

The bladder was much enlarged and flaccid; towards its fundus were several large gangrenous spots, two of which fallen into ulceration, had burst through the peritoneum, in consequence of which the urine had escaped into the abdomen. The cellular membrane between the peritoneal and muscular coats of the bladder, was in several places of a lurid colour, œdematous and putrid, from the diffusion of urine through its texture.

The prostate gland formed a very large tumor, each of its lobes being much increased in size. There was no stricture, but one false passage was found about the middle of the urethra, and several in its prostatal part. The magnitude of the prostatal tumor had been the means of preventing the instrument clearing the diseased gland, the trocar having passed through the third lobe, in effecting

the puncture. The canal thus formed had remained pervious, without however inflammation or other mischief appearing to have been induced by the accident.

It appears probable, that in the early stage of the complaint a degree of inflammation had existed towards the fundus of the bladder, which from the exhaustion of power incident to over-distention, had passed rapidly forward, to mortification. The urine escaping into the abdomen had brought on a certain degree of peritoneal inflammation, but without inducing effusion of coagulable lymph.

CASE 57.

Retention, from Enlarged Prostate, wounded in the Attempt to draw off the Urine.

MR. WATSON was sent for to a gentleman, aged 73, for retention of urine, none having passed since the day before. There was little pain or distention of bladder; but by the rectum, the prostate gland was felt much enlarged. The catheter was passed, and thought to be in the bladder, but nothing was discharged but some clotted and fluid blood. Yet even this evacuation eased him very much. A bougie also, was passed, as it was thought, into the bladder, without any difficulty; but no water followed. Dr. HEBERDEN, judging the kidneys to be probably more in fault than the bladder, ordered bleeding, warm bath, and appropriate medicines.

From the ease with which it was introduced, and from the length to which it passed, it was thought the catheter must have reached the bladder. But the instrument felt confined, and the end somehow locked in, so that it could not be turned freely, as it can when in the bladder; and knowing he had a stone in the bladder, neither could that be felt. These were reasons for doubting being in the bladder.

In the evening, having passed no water, Mr.

WATSON again introduced the catheter, blood following as before. It must be observed, though no urine followed, every bleeding afforded him a great deal of ease.

On the following day (the third of the retention), the Doctor ordered saline and purging glysters, for he complained of great uneasiness, as he supposed for want of an evacuation. In the evening no stool having occurred, a large glyster was thrown up, by way of fomentation, as he complained of great uneasiness, and distention of belly. Eight spoonfuls of castor oil failed to operate, though a medicine he was used to, and which never before failed to relieve him. A purging mixture had no better success. Mr. HAWKINS now visited him, and passed the catheter with the same doubts that had attended before. Again put into the warm bath, he passed about an ounce of urine, tinged with blood.

On the fourth day, the belly, greatly inflated, he passed a trifling quantity of water, his great complaint was the want of a stool, which he was quite persuaded would remove all his distress. He was repeatedly immersed in the warm bath, but no action of the bowels could be obtained. Towards evening his pulse suddenly declined, and early the following morning he died. The bladder was never distinctly felt above the pubes, nor was there the violent tenderness and pain of over-distended bladder, nor the quick hard pulse of inflammation.

The colon and cæcum, greatly distended with air, with the injected fluids, formed the whole tumor of the abdomen. The bladder just appeared above the pubes, and was somewhat thickened. It was opened at the fundus, and a pint and a half of urine discharged. A calculus, the size of a hazel nut, lying loose in the cavity, was also taken out. About an ounce of grumous blood was found at the neck of the bladder. The inside of the bladder had, towards its lower back part, somewhat of an inflammatory appearance.

The prostate gland was very much enlarged forward, and of a globular figure. Cutting it through on the fore part, there appeared on the right side of the caput gallinaginis, a lacerated wound in the substance of the gland. The lacerated flap of this wound, when the two sides of the gland were brought together, applied itself so exactly to the orifice of the urethra, that any instrument introduced into the urethra, would necessarily pass into the wounded substance of the prostate gland, and not into the bladder. *

CASE 58.

Retention, from Diseased Prostate Gland wounded by the Catheter.

THE Rev. Mr. D., 72, had retention of urine. Bleeding, warm bath, glysters, purges, opiates, and fomentations, had all been tried without success. A gentleman in attendance had passed the catheter, as he thought, into the bladder; but only blood followed. Mr. WATSON was then sent for, to pass it, but found the urethra so very irritable, that he could only bear it passed two inches, although introduced in the most tender and deliberate manner. Fomentations, &c., were again directed, but thus he continued. It was proposed to puncture the bladder by the rectum, but the prostate gland was found too large to admit of the operation. However, some water occasionally made its escape, and sometimes, assisted by external pressure, flowed rather freely. He was attacked with putrid sore throat, with rambling and delirium; for which the bark was given in mutton broth, and by glyster. The fever, notwithstanding, increased, and he died on the twelfth day.

The bladder, greatly distended, was on the left side blackish, as if bruised, or like an extravasation

* From a MS. of Mr. WATSON'S; in Mr. HEAVISIDE'S Museum.

of blood; verging towards gangrene. The prostate gland prodigiously enlarged, protruded within the bladder. Several small stones appeared to be lodged either in the fat or blood-vessels, about the neck of the bladder and prostate. Just above the caput gallinaginis, the membrane of the urethra had been lacerated, a passage having been forced through it for some extent, into the prostate gland. *

CASE 59.

Retention, from Enlarged Prostate, relieved by Puncturing the Bladder.

A GENTLEMAN in the 68th year of his age, requested Mr. HEAVISIDE to visit him, Dec. 23. 1819, for a retention of urine. Having passed no water for near forty-eight hours, the bladder was very painfully loaded, reaching up to the navel. All attempts were unavailing, to introduce any kind of instrument by the urethra. The prostate gland was so enlarged, as even to render the puncture of the bladder by the rectum impracticable; Mr. HEAVISIDE therefore determined to make an opening into it, above the pubes. For this purpose an incision was carried through the integuments, and at one point (an inch above the symphysis pubis) through the linea alba. A trocar was then passed through the coats, into the cavity of the bladder. Three pints of a most offensive chocolate-coloured urine drawn off, part of a flexible gum catheter was passed in through the canula, which was then removed; the elastic catheter being secured from slipping out, and fitted with a plug, to prevent the wetting of the bed.

The urine poured off, exhibited small shreds of coagulable lymph floating in it, but no distinct se-

* From a MS. of Mr. WATSON's, in the Museum of Mr. HEAVISIDE.

diment, except a quantity of dark-coloured powder, like putrid blood. Towards the evening the pulse was firm and regular, 84 ; and he had enjoyed some refreshing sleep.

The operation performed at six in the afternoon, at twelve at night the plug was taken out, and a pint and a half of high-coloured, but healthy looking urine drawn off.

December 24. At six this morning, a pint of pale but healthy urine was drawn off.

December 27. The piece of elastic catheter, cut to a convenient length for being kept in the wound, had been secured by tying tight round it a strong waxed ligature, the ends of which were attached to a bandage, passed round the body. In proceeding to draw off the water this morning, the bandage having moved a little, the end of the elastic catheter was found to have slipped out of sight. This accident appeared to have arisen from the projecting end of the plug catching in the bedclothes, by which the catheter was pushed entirely into the bladder. Keeping the plug quiet, as a director for the end of the tube, and better able to depend on the ligature that was tied round the catheter, I held the former steady, while the latter was gently withdrawn in the direction of the wound ; by this means, the tube was safely recovered, whereas had the plug been pulled, it might have come out, and the canula would then, probably, not have been recovered without a painful enlargement of the wound. A small circular plate was then fixed to the instrument, so as to prevent the possibility of a recurrence of this accident.

January 4. 1820. A few evenings back, several unavailing attempts were made to introduce an instrument by the urethra, into the bladder. Elastic and metallic catheters were tried, but to no purpose. The urine, now darker than before, and depositing an opaque yellowish mucus, still passed freely by the wound ; but the expulsion of the last

drops was now productive of painful spasms near the glans penis. Tongue furred, with a blackish streak along its centre; pulse 72; appetite pretty good.

Jan. 7. The urine on one occasion, of a florid bloody hue, most frequently was slightly tinged with blood, and much mucus. As it was thought that the piece of elastic catheter might, perhaps, have caused irritation, it was carefully and lightly withdrawn; in accomplishing its removal, I perceived a momentary difficulty, and a sensation as if something held it. This, however, immediately gave way; it now came quietly out, and the last inch of the tube was found partially imbedded in a yellowish and very adhesive matter, looking somewhat like mucus in its appearance, but so partially soluble in warm water, as more nearly to resemble coagulable lymph. This scraped away, a partial deposit of the phosphates was found upon the clean surface of the elastic gum. It is curious, that while the catheter was gently moved from its position in the bladder, the patient (who did not know what was doing,) said he felt a sense of heat in the neck of the bladder, and a prickling sensation in the orifice of the urethra, and enquired if I was not pouring in hot water. I have no doubt that in this instance adhesion, through the medium of effused lymph, had already taken place between the end of the catheter and the surface of the bladder, and had the instrument remained longer, it might have proved a source of greater inconvenience.

Jan. 11. For several days, the spasmodic pains, like pins and needles, near the end of the penis, had been very troublesome.

Jan. 15. A fresh catheter was placed in the wound.

Jan. 18. On this day, with considerable difficulty, a flexible metallic catheter was introduced through the urethra into the bladder, and there

allowed to remain. The tube was immediately removed from the healthy granulating wound above the pubes, with a view to its healing.

March 4. The metallic catheter was withdrawn, and one of elastic gum, upon a stilet, introduced in its stead. The following evening, the catheter slipped out; and during the night, feeling a desire, he, with some difficulty, passed, for the first time, near a pint of urine, by the natural efforts, without any having escaped by the wound. The catheter, however, was next morning replaced, as he could not yet exactly depend on his power of relieving himself without it.

March 15. The wound on the abdomen, dressed with lint only, was now perfectly healed. The catheter having slipped out of the bladder, was laid aside; and the whole of this day he found he could pass his water in an easy pleasant stream, at any interval he pleased. To day he voided his urine first, and then had a catheter passed, when only three ounces of water were found to have remained behind, upon which he was advised to lay aside entirely the use of the instruments. This gentleman has since recovered his strength so completely, as to enjoy better health than he had known for many years past.

Feb. 1823. This gentleman had experienced no tendency to a return of his complaints.

CASE 60.

Retention, from Enlarged Prostate.

J. L., a man aged 73, observed a degree of frequency in passing his water, in *May* 1816. He soon afterward complained of being, occasionally, unable to pass it at all, even when he had left his bed for that purpose, until he had walked a little about the room.

April 23. 1817. He could pass no urine, though distressed with frequent desire and straining. On

the 25th, he desired a medical gentleman to see him, who ordered the warm bath. He had still urgent desire, but passed nothing. On the 26th, I was requested to visit him, and introducing a large catheter with perfect ease, drew off more than two quarts of water. The prostate gland, examined by the rectum, was found considerably enlarged. From this time I continued to draw off the urine regularly, till the 22d of *May*, when he recovered the power of expulsion. The water generally exhaled a strong ammoniacal odour, was of brownish colour, without mucus, but sometimes depositing dark-red particles of gravel.

August 17. He called, and said he had some returning difficulty in getting rid of his water, generally worse towards evening, and better on the approach of morning. Some leeches were directed to the perineum.

Oct. 20. He sent in great distress, not having passed any water for two days. I drew off two pints, and the retention left him.

Jan. 28. 1818. He sent to beg me to see him as soon as possible, having passed no water for the last thirty-six hours. I now drew off three and a half pints; after which, the bladder recovered its power. It appeared, that the last attack had been the consequence of some degree of intemperance.

Jan. 1. 1819. For several days, the retention had returned. I again examined by the rectum, and found the prostate as large as the half of a middling sized apple, so that the finger could scarcely compass its convexity, or distinctly reach the bladder above it.

Sept. 3. From severe cold, the retention returned, and had existed twenty-four hours when I visited him. The silver catheter found some obstruction from spasm at the bulb of the urethra, but with some little pressure passed on to the prostate, and here a finger, behind the scrotum, easily raised the point over the projecting part of the gland, and it

readily slipped into the bladder. The water drawn off for two days, he again recovered the power of voiding it by the natural efforts.

Jan. 26. 1820. Had a return of retention, which resisted the introduction of the catheter with more than usual obstinacy, the prostate gland feeling of a cartilaginous firmness. By keeping the instrument in the bladder for a few days, he recovered. In *June* and *September* following, I was again obliged to relieve his full bladder, after which the power of expulsion returned.

Nov. 1822. He continued in good health; although occasionally obliged, for a day or two, to have recourse to the catheter.

CASE 61.

Retention, from Enlarged Prostate Gland.

IN *March 1818*, Mr. HEAVISIDE was requested to visit a gentleman, aged 69, who, while under the care of Dr. HOOPER for another complaint, had retention of urine. Mr. HEAVISIDE found there was also an immense scrotal rupture on the right side, reaching down very nearly to the knees; and examining by the rectum, ascertained a very enlarged prostate gland. The urethra, by the weight and magnitude of the hernia, was so dragged out of its proper course, that an elastic gum catheter, passed with great difficulty beyond two acute angles of the canal, was stopped by a third obstruction, which could not be overcome, apparently in the prostatal part of the urethra. Upon this account, the patient was requested to see another surgeon in consultation; who, after Mr. HEAVISIDE had again endeavoured, in vain, to introduce a catheter, made several unsuccessful attempts, but at last, with a large silver catheter, forced his way, and with extreme distress to the patient, the water was drawn off.

Much local pain, fever, and tenderness about the lower part of the abdomen, followed the oper-

ation, for which symptoms, he was, for some time, attended by Dr. HOOPER. The retaining an elastic gum catheter in the bladder, and occasionally changing it, constituted nearly the whole of his surgical treatment; for although it might be supposed that his rupture ought to be supported by some sort of bandage, and attempts of this sort were repeatedly made, he could never bear them, for if the hernial tumor was raised only three inches, it invariably produced a pain in the bladder, only relieved by letting it down again.

Feb. 1822. The general health began to decline, the appetite gave way, while nausea, and sometimes vomiting, came on. The bowels acted regularly, but medicines failed in removing the irritable state of the stomach, which, at length, rejected every thing that was taken; he now sunk more rapidly, and on *April* 8. died.

I was desired to examine the body; which, with the contained viscera, was excessively loaded with fat. The pyloric end of the stomach was drawn downward by the omentum, which descended at once by the spacious opening at the groin into the hernial sac. Into the same cavity, the whole of the colon had passed down, and was closely adherent to the parietes of the bag; the very adhesions having become as much loaded with fat, as the omentum or mesentery. The abdomen contained some, but the sac most, fluid; in the whole, about twelve pints of serum. Some few adventitious bands, from effusion of lymph, were found in the lower part of the abdomen. These bands were probably the result of the peritoneal inflammation, that followed the first introduction of the catheter; and one of them, attached to the fundus of the urinary bladder, and to the intestinal canal near the rupture, explained the cause of the uneasiness felt whenever the hernia was supported.

The urinary bladder, prostate gland, and urethra removed, the inner membrane of the urethra,

laid open, was highly vascular and irritable. The bulbous portion of the urethra, owing to a strong preternatural band of ligamentous fibres attached to the left side of the ossa pubis, and passing thence to spread itself over the bag to assist in its support, was pulled downwards, and drawn entirely out of its natural course. Opposite the part where this band lay against the canal, the inner membrane of the urethra was upon the left side ulcerated, to the extent of an inch. The appearance of the ulcer was that of a greyish-coloured, purulent, sloughy, cellular membrane, with a very vascular margin. Between this spot and the external opening, upon the right side of the urethra, was a second ulcer, less extensive, but otherwise similar to the first.

The prostate gland was exceedingly enlarged. In the posterior part of the prostatal portion of the urethra was a ragged opening, passing through the substance of the gland, for the extent of an inch; by this opening a large-sized bougie freely entered, and as freely passed out, through a second opening, through the projecting part of the gland, into the cavity of the bladder. The mucous membrane near these openings was extremely vascular and irritable. From the great difficulty experienced, and the violence that had been employed in the first introduction of the catheter, it is pretty clear the instrument was then forced through the substance of the enlarged gland; for that operation was attended with such excruciating pain that he roared and stamped furiously, and bled so freely by the urethra and through the catheter, that although it was presumed a quart of urine was drawn off, it was not easy to determine what proportion of it was blood.

The ulcers in the urethra appeared to be the result of the irritation and friction incident to the frequent removal of the catheters, an operation that always excited extreme pain; and as this distress was of course regulated by the degree of change the instrument had undergone by lying in the

urethra, it became a peculiar care to withdraw the catheter sufficiently early. There was considerable difficulty in determining this point correctly. The progress of this case, however, afforded Mr. HEAVISIDE a favourable opportunity for ascertaining the comparative value of elastic gum catheters, of common, and those of superior manufacture, applied in the same case, and under the same circumstances. The maker first employed was frequently told that the outside of the catheters became rough, and were therefore productive of extreme pain in two or three days, and sometimes in less time, the smooth surface being either raised into innumerable sharp points, or into small blisters. At length, long determined to try some other catheters, a person was recommended as an excellent instrument-maker, (Mr. WEISS, of the Strand,) of whom some elastic catheters were procured, and these after the first trial were constantly preferred. Mr. HEAVISIDE observed that the former catheters he had been sometimes obliged to remove within eight hours after they had been passed new, and they were even then found more rough and spoiled than those of the latter kind, after ten days' residence in the bladder; at which time withdrawn, they were sometimes perfectly unaltered, and being laid aside and allowed to dry, were again passed, and kept in twelve, or even thirteen days more. One exactly under these circumstances I examined; it was smooth and polished as if new, though on slitting it up, its cavity was covered with a coat of mucous and sabulous matter, proving its having been much used.

CASE 62.

Retention, from Enlarged Prostate, relieved by Puncture of the Bladder.

July 20. 1820, I was sent for to Chelsea, to see a person who had passed no water for forty-eight hours. I found the patient a very robust corpulent

man, 82 years old. He could give no very distinct account of himself. Examined by the rectum, the prostate gland was felt much enlarged, so much so, that with the subject being fat, it was not possible to compass it with the finger, so as to ascertain the state of the bladder by the bowel. I was informed that on the preceding day four or five attempts had been made to pass a silver catheter, but without success. The result of the attempts I made myself were equally unsatisfactory, although I tried catheters of elastic gum, and of silver variously curved. There was no difficulty in reaching the prostate, and I once got a silver catheter to pass one inch and a half along the passage beyond, and at the moment perfectly believed into the bladder, but it was not so; and this left me in some uncertainty whether the attempts made on the preceding day, as bleeding occurred, might not have formed some false passage either by the side, or into the substance of the prostate gland.

The full bladder being distinctly felt above the pubes, I felt it necessary to pay him a second visit in the afternoon, when I determined on the necessity for puncturing the bladder; and as the prostate gland prevented its being felt from the rectum, the operation was performed above the pubes.

I first exposed the linea alba, by a free longitudinal incision through the skin and fat, the termination of the line being nearly as low as the pubes, but not quite, that there might be a little thickness of adipose membrane left, to admit of any accidental sloughing without injury to the symphysis. The fibres of the linea alba for some small extent, half an inch above the pubes, were then carefully divided with the scalpel, until both by the eye and finger the softer muscular structure of the coats of the bladder was brought fairly into view. It was now manifestly evident the bladder was full; a trocar was therefore cautiously passed into its cavity, and the stilet being withdrawn, the urine

rushed forth. From the considerable depth of the opening, much of the water was lost, flowing over into the bed; two pints only were saved, of a clear, limpid, and healthy urine. An elastic gum catheter, at the close of the operation was introduced into the bladder, the canula of the trocar being withdrawn over it.

July 21. The patient much recovered, now stated that on the first day the retention was extremely painful, but that on the second and third he felt no pain either before, in, or after the operation. The catheter remaining in its place, the urine passed freely and without pain.

From this time the canula of elastic gum, cut to a convenient length, and secured from the possibility of slipping entirely into the bladder, was kept in, and only occasionally changed. He was one day desired to be careful not to let the canula slip out, and from that time gradually got into a habit, which no persuasion could afterwards break him of, of frequently pushing in the instrument as far as it would go. The operation had succeeded most happily, and for the first week his health improved, a single film of slough only forming upon the exposed surface of the adipose membrane; but having been some years confined to his bed by the infirmities of old age, he was totally helpless, and it was not possible to keep him constantly dry. Inflammation and sloughing took place upon the hips; and notwithstanding every assistance from bark, wine, porter, and the best diet, &c. he declined, sunk, and died on the 20th of *August*.

On opening the body, I found the bladder much contracted, the inner membrane having at first somewhat the appearance of a congeries of enlarged varicose veins, but it did not appear to have suffered from any extended inflammation. The part of the prostate gland which projected into the bladder, forming the middle lobe, had become a slough, and was reduced to a tough, yellowish-green, pulpy

mass. The inner membrane, immediately encircling the basis or margin of the mortified portion of the prostate gland, was of a bright scarlet colour, demonstrating the effort made to establish a separation between the dead and the living parts.

The body of the prostate gland very considerably enlarged, contained several small encysted calculi. The prostatal part of the urethra and caput gallinaginis, were highly vascular and irritable.

The difficulty experienced in attempting to pass the catheter, appeared to have arisen from a deep depression found towards the right side of the canal within the substance of the prostate gland. The state of slough to which the middle lobe was reduced, appeared to me after a careful consideration of the position and length of the canula, replaced in the bladder, to have been partly at least brought on by the habit he had got into of incessantly pushing in the tube, which kept up local disturbance by fretting the irritable surface of the membrane covering the gland.

SECT. XVIII.

On Retention, from Spasmodic Stricture in the Urethra.

561. THE urethra is that canal which opens outwardly from the urinary bladder, at the extremity of the penis.

562. By dissection we learn that the urethra is made up of several different structures, all of which possess a certain measure of elasticity. It has been already observed that the inner membrane of the urethra is continuous with that lining the cavity of the bladder, and that it forms an extensive secreting surface.

563. The canal of the urethra is surrounded by a cellular or spongy structure for the greater part of its extent, which cellular structure becomes turgid with blood, together with the cavernous bodies of the penis, while the parts are under the influence of the venereal excitement.

564. External to its spongy structure, the urethra receives a partial support from certain muscles of considerable power, subservient to the purpose of generation, as well as from several ligamentous expansions by which it is more immediately connected to the symphysis pubis.

565. Laying open the cavity of the urethra, we see that its internal appearance varies, conformably to the particular office assigned to each part. At the neck of the bladder it is of a pale yellow colour, and it has much the same appearance where it passes through the prostate gland, and receives the seminal ducts. Just beyond this, at the membranous portion, the canal becomes smaller, and from being more freely supplied with blood, assumes a dark-red colour. Immediately before the membranous part, the canal for the space of two inches becomes more relaxed and capacious, and the inner membrane still more vascular, forming the bulb of the urethra. Anterior to the bulb the diameter and vascularity are again reduced, so that the colour of the inner membrane is comparatively pale.

566. These appearances in the healthy urethra correspond to the functions allotted to the different parts of the canal. We know that as a general rule, the sensibility and irritability of parts bear a certain relation to their vascularity; and upon this principle there would be no difficulty in determining, from the appearance of the parts, that the most irritable points in the urethra must be the bulbous and membranous portions, and that the only part sparingly furnished with irritability, and therefore not provided for occasional excitement and action, is that portion which passes through the prostate gland.

567. Upon the internal surface of the urethra numerous small openings may be observed, into each of which a common bristle may be passed obliquely backward, for about one-eighth of an inch. These are the orifices of the lacunæ. They fur-

nish a certain proportion of the mucous matter by which the surface of the canal is kept moist, exhibiting one of the simplest forms of glandular structure; and like other glandular parts are liable to inflammation; in which case they suffer enlargement, secrete purulent matter, or become the seat of abscess.

568. The most complicated function in which the urethra is concerned is that which it performs, in concert with the parts immediately surrounding it, in the expulsion of the semen. During the excitement immediately preceding this act, the seminal fluid is accumulated in the bulbous part of the urethra preparatory to emission, and upon the accession of spasm the membranous part that leads back into the bladder is so closely contracted as to be completely shut up, while the bulbous portion of the canal, together with the stronger muscles surrounding it, contracting with force, the contents of the urethra are driven forward with considerable impetus, the action of the muscular fibres of the canal coming forward with its contents, even to the orifice of the urethra.*

* The almost infinite variety that may be observed in the resources of Nature, is well calculated to excite admiration. The spasm by which the membranous part of the urethra is closed, in the venereal act, is obviously appointed to prevent the dispersion of the seminal fluid. The same end is answered by a more ingenious and simple contrivance in some of the lower orders of the mammalia. For example, in the male porpoise, which I have dissected, the bladder communicates freely with the urethra, but the seminal ducts open upon the centre of a soft, spongy, vascular papilla, that projects forward into the urethra, as the os uteri does into the vagina. Over the surface of this papilla, while flaccid, a probe may be readily passed through the semilunar opening into the bladder; but just at this part the urethra is found encircled with a strong thread of ligamentous fibres, so that when preparatory to the coitus, the parts are turgid with blood, this spongy vascular papilla swelling up, becomes so tightly girt by the ligamentous circle round its neck, as to effectually close the passage into the bladder, and prevent the possibility of the dispersion of the fluid collected in the urethra. These facts have, however, passed unnoticed

569. These are the appearances and actions of health; but it is under circumstances of disease that the strongest evidence is afforded, that the urethra is possessed of a muscular power. Indeed the fact may, in my opinion, be proved in almost any instance by introducing a bougie of moderate size into the healthy urethra, and lightly supporting the end that projects from the penis in a horizontal position. If the action of the urethra is then observed with attention, it will be found that the power which expels the instrument, in other words the contraction of the urethra, is nearly uniform through its whole extent. The point of the bougie is not pushed forward more quickly while moving through the bulb, where the canal is surrounded by strong muscles, than afterward; on the contrary, its motion is exceedingly slow and uniform, until the whole of the instrument at length expelled, the point fairly drops from the orifice of the urethra.

570. This may be said to shew the elasticity of the inner membrane, and perhaps had the bougie been passed only to the extent of half an inch into the urethra, its expulsion upon this principle might be admitted; but when the instrument has been introduced several inches, the advocates for elasticity forget that while the membrane of the urethra is exerting itself for one-eighth of an inch to push along the end of the bougie, the same power is operating against it to the superior extent of several inches, and that the considerable friction from so extensive a surface of contact does away the probability of

in a paper upon the Anatomy of the Porpoise, by Dr. TYSON, in the Phil. Trans for the year 1681; neither is there any allusion to them in the excellent paper of Mr. HUNTER, on the Economy of Whales, Phil. Trans. 1787. A provision in some respects similar to the above is found in the urethra of the tortoise, as demonstrated in a work produced in a style of unusual splendour and accuracy, upon the Anatomy of the European Tortoise, recently published by Professor BOJANUS, of Vilna.

elasticity having any thing to do in the actual expulsion of the instrument.

571. It has been generally considered that the urethra is not only muscular, but that its canal, like other muscular tubes, is in particular cases subject to partial contraction or spasm, and that this spasm constitutes one kind of stricture in the urethra ; and really the evidence which every day's experience affords upon this point is so clear, that it seems unreasonable to affirm the urethra has no muscular power, and that consequently spasm has nothing to do in its diseases ; particularly as comparative anatomy demonstrably proves that in the larger animals, especially the horse, where structure is more readily developed, and where the functions of the urethra are precisely the same as in the human subject, the muscular fibres encircling the urethra cannot be overlooked.

572. As the urethra is a membranous canal, surrounded by muscular fibres, its being occasionally subject to an excessive degree of contraction at any particular point, is only a quality it possesses in common with all other muscular structures under similar circumstances.

573. Where from any cause the contraction of the muscular fibres of the urethra is partial, and to a certain extent permanent, it produces a hindrance to the free flow of urine ; generally exciting attention, and in this state termed a spasmodic stricture.

574. The affection in this stage of its progress, is very properly considered spasmodic, as the term refers merely to an excessive action of muscular fibres, not to any change in the organization of the parts. There are also many proofs, that this view of the nature and cause of stricture is well founded. In the first place, the causes by which the contraction in the urethra may be brought on, are those capable of inducing irritation in other muscular parts ; secondly, the sudden manner in which the effect may follow the cause, affords a strong

argument that the stricture must be pure spasm ; and lastly, it is proved, by the immediate relief afforded by certain medicines, which it is well known, can operate only by removing spasm, as well as by the appearances that are sometimes found after death. (Cases 72. and 73.)

575. This species of contraction has been described by Mr. HUNTER as generally affecting only a very small extent of the canal, producing an appearance in the urethra, as if it had been surrounded by a packthread.

576. While the stricture remains in this state, it is liable to occasional contraction and relaxation, from the influence of apparently trifling circumstances. It necessarily becomes the most irritable part of the canal, and any change in diet, excess in wine, exercise, or fatigue, may aggravate the degree of spasm, excite inflammation, and bring on complete retention of urine ; the usual consequence of which is, that the stricture at first mere spasm, becomes converted by degrees, into a permanent contraction of the part, from change in structure, incident to repeated inflammation.

577. As stricture in the urethra is almost always in the first instance the effect of irritation, it is natural to infer, that the tendency of the contraction will be dependent on the circumstances producing it. Where the stricture has been brought on by sympathy with some surrounding part, as in affections of rectum, bladder, or prostate gland, the complaint will be at first spasmodic, and very likely to remain so ; where, on the other hand, an irritating cause of considerable power has been at once brought into immediate contact with the inner membrane of the urethra, as in using astringent injections for gonorrhœa, or from calculus arrested in its passage through the urethra, exciting extreme pain and violent inflammation, it generally happens that effusion of coagulable lymph takes place into the surrounding cellular texture, thus laying the

foundation for the most obstinate and extensive kind of stricture.

578. The irritation of stone in the bladder generally operates sooner or later, as an exciting cause of stricture; and where the contraction is obviously spasm, and is readily overcome, so as to admit of the calculus being distinctly felt in the bladder, the affection in the urethra may very safely be considered as the consequence of the irritable state of bladder.

579. Where sympathetic spasm in the urethra, productive of retention, is induced by affection of rectum, the characters of the complaint are in some respects peculiar; and while on the one hand, they may occasionally require management, on the other, they appear very well disposed, provided they are treated with the necessary degree of temper and gentleness. (Cases 70. and 71.)

580. It has long been a contested point in surgery, whether injections thrown into the urethra have the power of producing stricture. In many cases, it is certainly not possible to prove clearly, that they have done so; but in some instances, I have known them, through the medium of inflammation, not only to leave strictures, but those of the worst and most obstinate kind that could possibly be, which were never afterward removed, and scarcely admitted of any material relief.

581. In these instances however, the seat of the affection having been the anterior or external part of the canal, and this not being the most usual situation of stricture, originating in spasm, it might still admit of doubt, whether the irritation from an injection applied to the one extremity of the urethra, is capable of producing spasmodic stricture at the other. As far as my experience has enabled me to judge, I am clearly of opinion that stricture is, in many instances, derived from this cause alone.

582. In one case particularly, a patient with gonorrhœa had been directed to use an injection

of so moderate a strength, that it did not materially lessen the quantity of discharge, and was not the means of exciting any increase of inflammation; but it nevertheless brought on a retention of urine, for which I was consulted, and on passing a bougie, a spasmodic contraction was found in the most usual seat of stricture, the membranous part of the urethra. This affection, however, was readily relieved by the warm bath, and opiates.

583. In this case, we see that an irritation comparatively slight, was answered by a correspondent temporary contraction at the part sympathizing with the seat of the original impression. But in several other instances, and in two particularly (Cases 80. and 88.), the use of astringent injections that were sufficiently powerful to excite violent inflammation in the anterior part of the urethra, were also productive of permanent stricture at the membranous portion of the canal, in connection with irritable bladder.

584. Any external violence may operate as an accidental cause of stricture in the urethra, by producing either irritation, inflammation, ulceration, or perhaps sloughing in some part of the canal. (Cases 48. and 50.) The application of blisters have now and then produced spasmodic stricture; although the excitement from this cause, being of a temporary nature, the inconveniences to which it may have given rise, do not often prove tedious.

585. It has been already demonstrated, that the most irritable parts of the urethra, are the membranous and bulbous portions. (565.) It has been also pointed out, that in the first of these two situations, there is a provision for an occasional spasmodic action of the muscular fibres of the urethra, as a circumstance essential to the complete effect of the most important function these parts have to perform. (568.) This, therefore, is found to be naturally the most contracted part of the urethra, and most frequent seat of stricture. Next to the

membranous part, the bulb is subject to contraction, although the same change occasionally takes place in the other parts, between the bulbous portion, and the external orifice.

586. Stricture in the urethra is a disease which in its commencement is very rarely, if ever observed. Its early progress is very imperceptible, because not often productive of symptoms. It is natural to suppose that even in its beginning, as stricture consists in a contraction of the canal, the stream of urine must of necessity be lessened; but the same circumstance may occasionally arise from such various and trivial causes, that this symptom alone is scarcely ever regarded by the patient.

587. The appearance of the stream of urine may, however, have a striking peculiarity, in assuming a spiral or twisted form; and in the more advanced stages, it is not uncommonly divided into two smaller jets; and these circumstances will not only be found to vary in different cases, but in the same case at different times, according to circumstances, the state of constitution influencing the contraction of the stricture.

588. In the progress of the affection, there is occasional pain, in or about the contracted part of the urethra, attended with some degree of frequency in making water, circumstances very apt to be reproduced, or increased, by irregularity in diet or exercise.

589. As these attacks continue to return, it is at last observed, that the stream of water is certainly much smaller than natural; and as this remark is generally made at a time when more or less uneasiness is felt at the neck of the bladder, perhaps with frequency and straining in voiding urine, the patient consults his surgeon, who, on passing a bougie, ascertains the stricture.

590. The habit of frequent intercourse with women generally exerts an unfavourable influence upon the early stages of stricture. This arises from

the temporary state of violent spasm thus induced, having a natural tendency to increase any degree of contraction previously existing. The same unfavourable influence has now and then been found to arise in cases of spasmodic stricture, merely from being in company with women; a remark I believe to be more particularly applicable to some other affections of the urethra. A young gentleman whom I had attended for gonorrhœa, had got entirely rid of all the symptoms, and thought he might again venture into company. His first visit was to the pit of the Opera House, on a moderately cool evening. The next morning he sent for me, told me where he had been, said the ballet had greatly interested him, but to his great surprise, he found the discharge had returned, and was just as bad as ever; and in spite of the usual means, it continued for more than three months.

591. Where a spasmodic stricture in the membranous part of the urethra, from injecting for gonorrhœa, has brought on complete retention of urine, and the catheter, at first passing with ease, is after a time so powerfully resisted, as not to admit of being introduced at all without absolute violence and injury to the parts, the vigorous application of medical treatment may sometimes supersede any further necessity for surgical assistance. The spasm which by no art could be made to yield to an instrument, shall be made progressively and effectually to relax, by judiciously and progressively lowering down and relaxing the tone of the whole constitution, to a point that is inconsistent with the maintenance of local spasm. (Case 69.)

592. The irritable state of stricture consequent to the spasm that occurs in the venereal act, is not confined to the mere increase of contraction; it frequently excites sympathetic uneasiness at the external orifice, with increased secretion from the membrane lining that part of the urethra; and from the manner and circumstances under which

this occurrence usually takes place, it is liable to be mistaken for gonorrhœa.

593. Moderate attention, however, will enable the practitioner to distinguish the two cases. The accession of the discharge is more sudden, the inflammatory symptoms with which it may be attended infinitely more moderate, than in gonorrhœa; indeed, the nature of the attack is such, that if let entirely alone, it in general subsides spontaneously in a week or two.

594. As the disease advances the contraction increases, the strictured part becoming so much smaller than natural, that the bladder is constantly called upon to make preternatural exertion to get rid of its contents; and the straining, formerly an occasional symptom in voiding urine, becomes a more frequent source of inconvenience, and eventually never entirely leaves the patient.

595. The irritation from stricture is occasionally productive of various symptoms, dependent on constitution and other circumstances. Not unfrequently it is the means of exciting the natural action of the parts at improper seasons, inducing nocturnal emissions. This symptom most commonly occurs in unison with other incidents that serve to clear up the nature of the case, but is occasionally the first motive to attention to the complaint.

596. In the further progress of the disease, the urinary bladder, constantly disturbed in the performance of its functions, becomes subject to increased irritability from the most trivial causes; the slightest cold will, on this principle, produce distress, exciting material increase in pain, and frequency of passing the urine, which is voided thick, turbid, and in small quantities.

597. Where the disease still continues to advance, the attacks of irritation come on more frequently, and prove more severe and harassing; in this stage of the complaint also it not unfre-

quently happens that the irritable state of bladder operates as a cause of aggravation to the stricture, which becomes so much narrower, as to render the urethra nearly, or entirely, impervious.

598. When the disease has reached this point, it becomes essential that the urine should find some other means of escape from the bladder; a provision that must be made either by the efforts of nature, or the exertions of art.

599. The treatment of stricture in the urethra is directed upon one of two principles, being intended either to remove the obstruction by relaxing the contracted part of the canal, without doing the least violence to the parts; or, if this fails, it professes to restore the passage through the urethra, partly by destroying the tendency to contraction, and partly by dilating that contraction.

600. The first of these methods of treatment is applicable to the relief of spasmodic strictures, and is occasionally assisted by the exhibition of opiate or other antispasmodic medicines, although, in a surgical point of view, the principal means is the use of the bougie; the second mode is generally directed to the removal of permanent stricture, and is also most frequently accomplished by the regular use of bougies, or other such instruments, assisted occasionally by the application of caustic.

601. In these complaints, however, as in most others, we are frequently taught that the success of all our efforts at local amendment must depend, after all, upon the improving or declining state of the general health; this last condition being ever subject to the habits of the patient. Derangement in the functions of the chylopoetic viscera will produce its influence, and where retention from spasm has arisen from intemperance, the relief of the complaint will depend more immediately upon clearing out the stomach and bowels, than upon any local treatment. (Case 65.)

602. In the early stages of stricture, when the

contracted part of the canal is not very irritable, the bougie, under proper management, is frequently the best instrument, and only local means necessary for removing the complaint.

603. Where this instrument is carefully adapted to the tone and degree of contraction of the stricture, the size of the bougie being increased as rapidly as the temper of the parts will admit, the affection may, in many cases, be removed without the intervention of any untoward circumstance, or the necessity for having recourse to any other assistance.

604. It frequently however, happens, that when this plan has succeeded, and long after the bougie is laid aside, the tendency to contraction returns upon the parts, the patient finds his former symptoms recur, and it becomes indispensable to again have recourse to treatment. We see, then, that the bougie, though capable of overcoming the effect — which is the contraction, does not always permanently remove the cause — the disposition to spasm ; but notwithstanding this, the bougie is still the most appropriate means we know of, and is indeed all that is advisable, while moderate irritability in the urethra admits of its being applied as often as necessary.

605. Unfortunately, a stricture that was formerly very readily relieved by the bougie, may become again troublesome, and prove much less manageable than it was at first. The strictured part of the urethra may have acquired so great an increase of irritability, that the introduction of a bougie is attended with extreme pain ; its being retained against the stricture is productive of very great distress, and if under these circumstances it is allowed to remain long in the urethra, but more particularly if the surgeon ventures to pass a bougie a size larger than ordinary, the irritation is so aggravated as either to excite spasm at the neck of the bladder and retention of urine, or

endanger inflammation and abscess in the perineum, inflammation of testicle, or some other ill consequence.

606. I have met with one instance of this kind of stricture, in connection with an extremely rare disease, an enlargement of one of the vesiculæ seminales, apparently scrofulous; and, from the course of the symptoms, I had reason to believe that it was this particular disease which led to the unusually obstinate retentions of urine, from spasmodic stricture, together with the severe consequences rarely met with, even in permanent stricture. The appearances were exactly those described in the admirable work on Morbid Anatomy, by Dr. BAILLIE; who observes, that he had only seen one example of the disease. (Case 73.)

607. The treatment of this irritable state of stricture will require much judgment; for although the degree of permanent contraction may be so trifling, that were the irritation and disposition to spasm relieved, the urethra might be with ease brought back to its naturally relaxed condition, by the bougie; yet while the irritation remains upon the parts, it will sometimes be difficult to determine what had better be done, for if let alone the stricture is sure to increase, and if meddled with in order to its being relieved by the bougie, the attempt may only aggravate all the symptoms.

CASE 63.

Retention of Urine, from Spasmodic Stricture.

A CORPORAL, in the 82d foot, aged 27, had for some weeks observed the stream of urine was smaller than usual; when on *Sunday* morning, *August 28. 1808*, he paraded for church. He felt desire to pass urine as the regiment went in, but did not like to fall out of the ranks. Waiting till service was over, he found he could not pass a drop. The effort,

attended with much pain, was followed by violent straining, and a few drops of blood. The desire returned frequently, every attempt being extremely painful, and attended with bearing down. Out of bed eleven times the following night, he could pass no water. On the *Tuesday* he attended at the hospital, I passed a bougie of moderate size, when a yielding obstruction, which gave pain as the instrument passed through it, was found at six inches. It was overcome by a pressure equal to an ounce weight. Much pain was felt in the seat of the contraction, for the minute the bougie was allowed to remain in the urethra.

On withdrawing the instrument, desired to pass his urine he made the attempt, and got rid of a table-spoonful, in a very contracted stream; the close of the act was productive of straining, and a few drops of blood.

During his return from the hospital to the barracks, up a steep hill, he repeatedly felt inclined to pass water, which each time followed more freely than before. The night before he had been up nine times; the night following the use of the bougie he was up only twice; and the night after this again, was not up at all, the symptoms having entirely left him. On passing a second bougie, a few days after, no obstruction was perceived, the stream of urine being as large as ever.

About a month previous to the above attack, he had mentioned to me a discharge from the urethra, which came on suddenly after connection with his wife, and gave him some alarm, as he had only four months before been in an hospital with venereal bubo, and gonorrhœa; which complaints had been treated by mercurial frictions alone. The bubo had suppurated and healed, and the gonorrhœa had subsided, unassisted by any local means.

On the present occasion I had desired him not to allow the discharge in question to give him any uneasiness, advising him to bathe every second

morning in the sea. He did so, and in the course of a few days the discharge entirely and permanently left him.

CASE 64.

Retention, from Spasmodic Stricture.

A GENTLEMAN, 32 years of age, consulted me for retention of urine, *December 2. 1816.* His medical friend acquainted me that he had attended him about two years before for stricture, which was relieved by bougies. The present attack had come on without any known cause, but the principal difficulty was that of getting an instrument into the bladder. The bladder was full, and the frequent spasm and straining severe; but the elastic catheter in the hand of his own surgeon would not pass, with or without a stilet. Requested to introduce one myself, I first gave the stilet a greater curve, when it went readily on to an obstruction in the prostatal part of the urethra, past which the instrument presently slipped into the bladder.

The water was drawn off night and morning for a week, during which time the compound powder of ipecacuan was given. Two severe shivering fits, with violent flushes of heat, perspiration, and a low pulse at 140, led to a change in the medicine, for an infusion of bark, with tincture of opium, which agreed perfectly well.

Under this plan the health improved, in a few days the power of expulsion partially returned, requiring the catheter only once a day. In the third week of my attendance, the power of freely voiding the urine was completely re-established; when requesting that his medicines should be continued a week or two longer, I took my leave.

February 1823, this gentleman remained well.

CASE 65.

Retention, from Spasmodic Stricture.

AN officer's servant, aged 43, applied to me, *March 23. 1822.* He had been long (since 1811) troubled with complaints proceeding, as he supposed, from gravel; occasional difficulty in passing water, with a deposit of reddish-coloured sediment in the urine, sometimes containing blood. In 1817, while in the country, he totally lost the power of passing his urine, and suffered much from desire and straining. On the third day of the retention, he sat for two hours without avail over the steam of hot water. The following night he was obliged to travel, and on reaching London next morning, by straining hard he was enabled to void his urine, first in a fine, and progressively in a fuller, stream. The above attack, attributed to drinking too freely of stale beer and ale, was attended with most severe pain about the loins, as well as in his bladder, the accumulation of urine and consequent distention being extreme.

Since that period, he had repeatedly been confined to bed for two or three days with retention; until by ætherial or other medicines, he recovered the power of passing his water, first dribbling or in a thread stream, but shortly more full and easy; and by the next day perfectly free and well. In two or three days, however, the pain and difficulty sometimes returned.

He was again ill, *March 3. 1822*, from drinking bad beer. He tried to pass his water, but could not; and for a day and a night voided little, very little, with constant pain in the bladder, which was greatly enlarged. He took medicines, and by degrees obtained relief.

The last attack commenced on the 10th instant. After drinking intemperately, he as usual lost the power of passing urine; and in spite of medicine was

not relieved till the fourth day, when the retention giving way, he got rid of an immense quantity of water. A very distressing consequence, however, remained; a protrusion of the anus, that for several days pushed out to the extent of three or four inches, nearly as large as an egg. This he generally returned as well as he could, but fancied it kept up an irritation and distress about the bladder; the stream of urine again diminished, and difficulty increased, till *March 23.* when he applied to me. A fair-sized bougie, gently curved, passed quietly into the bladder, finding only one spot near the prostate, irritable; making him very happy in the assurance that there was no permanent contraction in the urethra. On examination, the verge of the anus was free from tumor of any kind. I directed him the compound powder of ipecacuanha, which taken every night for a week, operated very favourably, and in fact so improved his local feelings and general health, that he could not be persuaded of the necessity for any further dependence either upon physic or surgery, and I consequently saw no more of him.

CASE 66.

Retention, from Spasmodic Stricture.

A YOUNG man, 25 years of age, contracted gonorrhœa in *January 1821.* The heat and inflammation trifling, he neglected it and lived irregularly. He took medicines, but used no injections. The discharge continued but three weeks. In the *July* following, he suddenly lost the power of voiding his urine, but took medicines, and was relieved.

August 21. His complaint returned, and he could void no water, till relieved again by medicine. About the middle of *September*, obliged to go down to Brighton, and too late for the coach, he endeavoured to overtake it by running and walking fast, but in vain, and travelled on foot all night. His retention now returned. A bougie introduced,

enabled the bladder to relieve itself; but returning by the coach the following afternoon, he could pass no water, on reaching London. By opiates he was again relieved, but had been subject to occasional retention ever since.

Sep. 26. He applied to me, and was directed to take ten grains of the compound powder of ipecacuanha every six hours, and was soon relieved.

Oct. 2. Retention returned; but passing a bougie for himself, the water flowed instantly.

Oct. 6. I passed a small bougie of flexible gum, through the contraction at the bulb, into the bladder; directing him to take an anodyne mixture, with the camphorated tincture of opium, night and morning.

Oct. 10. He voided urine more freely. I now passed several bougies in succession, allowing each to remain a few minutes in the stricture; the last introduced was moderately large.

Oct. 22. I passed a bougie the same size as the last, but could not get it beyond the prostate gland. I therefore tried one of a larger size; this went on readily into the bladder. He was desired to lay aside both medicine and surgery for the present.

March 4. 1822. He remained perfectly well.

May 3. Complaining of some return of contraction, I passed an elastic gum bougie, one-sixth of an inch in diameter, down to the stricture; and by waiting a minute or two, it moved gently and quietly on into the bladder. In ten minutes it was withdrawn.

May 10. He said he had found great relief from the last operation.

Dec. 1822. He remained well.

CASE 67.

Retention, from Spasmodic Stricture.

Aug. 1. 1817. I was consulted by a young gentleman who complained of a discharge from the

urethra; this he suspected might arise from stricture, having found the stream of urine sometimes very small, and more than once lost the power of passing it. He had three years before had gonorrhœa, for which at its onset, he was directed to use astringent injections, and although the usual symptoms of irritable bladder, as might be expected, soon followed, he was desired to continue this treatment for near three months. Sometimes the discharge ceased, but whenever he had connection, he was sure the next morning to find the discharge had returned. Several surgeons had on these occasions declared him clapped, which if true, must prove him most singularly unfortunate.

I told him, that probably it was no such thing, for that the discharge might reappear merely from irritation in the stricture, and nothing else. He observed, that passing his water gave him most pain near the orifice of the urethra. With a common-sized bougie, I found the anterior part of the urethra irritable and painful; beyond this, the canal was healthy as far as the membranous portion, where the instrument was stopped by a stricture. The smallest-sized elastic gum bougie, however, passed the stricture, and its diameter was afterward progressively increased; the irritability and discharge diminishing as the stricture relaxed.

On the 25th of the month, all discharge and irritation in the urethra gone, and a bougie, two-tenths of an inch, passing into the bladder with ease, I told him nothing further was necessary, and he left town for Oxford.

CASE 68.

Retention, from Spasmodic Stricture.

Dec. 12. 1817. I was consulted by a gentleman, a field-officer in the army, just returned from India; where three years before, in Ceylon, much exposed to bad weather and hard service, he had a severe

attack of rheumatism, attended with constant desire to pass his water, and sometimes great difficulty in avoiding it. Invalided, he embarked for the Isle of France, and by the time he arrived there, the rheumatic complaints in his limbs were nearly well; the irritation at the neck of the bladder, and a similar affection about the rectum, were also much relieved. Here he obtained leave to return home, after twenty years' service in India.

Since his arrival, he said, his complaints had principally consisted in a want of power to take exercise with comfort; for at the period of his visiting me, he could not walk for an hour without feeling an irresistible desire to pass a motion, and in the effort (usually unavailing) he commonly voided a little urine. This attack subsided as he recovered from fatigue, and he then found himself very well again. He had never suffered, either from hepatic, or bowel complaint; neither was he in the habit of being disturbed at night, retaining his urine till the bladder was fairly filled, except when the irritation came upon him, which generally was induced by any uneasiness of mind.

A moderate-sized bougie passed with very little difficulty, and a momentary impediment from spasm, into the bladder. The urethra was very irritable, but he suffered infinitely less than he had supposed possible. Half an hour after, the impression having subsided, I prevailed on him to allow me to examine by the rectum, where the prostate gland was felt rather broad in figure, but of its natural firmness, not at all irritable. As to constitutional health, the pulse was extremely small and soft.

The opinion I gave was, that a tonic plan of treatment, unassisted by local means, would in all probability completely remove his complaints, provided it was so administered as not to disagree with his constitution.

In *Feb.* 1818, I had the pleasure of hearing,

through a medical friend who had constantly attended this gentleman, that he was much improved in health by the adoption of the above plan.

CASE 69.

Retention of Urine, from Irritation, and Spasmodic Stricture.

ON the morning of Nov. 27. 1821, I was requested to visit a young gentleman, in great distress, from having passed no water for the last forty-eight hours. On my arrival, however, I found that by spoonfuls he had got rid of about half a pint. He said, he had for several weeks had gonorrhœa, and by direction of his surgeon, had used an injection. The discharge, notwithstanding, had continued, though in less quantity, till a few days previous to my seeing him, taking a violent cold, the discharge entirely ceased, and pain at the neck of the bladder came on, with increasing difficulty in voiding his urine, till at length he could pass none at all.

The pain was great, and the tumor above the pubes considerable. From the superior smoothness of surface, and permanence of curve, I was induced to prefer a small silver catheter, which passed with little pain, and without the least obstruction, into the bladder, and drew off a quart of dark-coloured urine.

The instrument was passed again in the evening, and a similar quantity of pale urine drawn off. The febrile action had, within the last few days, been so considerable, that his parents, alarmed for his safety, and determined to leave nothing to chance, placed him very properly under the care of Dr. HOOPER.

Nov. 28. I passed the catheter twice to-day, and found more pain and irritation at the neck of the bladder, with an irksome sense of weight, tenesmus, and frequent straining efforts. Bowels regular. By Dr. HOOPER's desire, I took eight ounces of blood from the arm.

Nov. 29. The introduction of the catheter was

still necessary, the urgency of the symptoms requiring a repetition of the bleeding. Tongue rather white; pulse 90, and moderately firm.

Dec. 3. The catheter passed regularly, night and morning. I now tried an elastic gum catheter, but as it did not follow the course of the canal so readily as the instrument formerly employed, it was laid aside.

For a day or two, there had been a copious albuminous deposit, like fine powder, in the urine, with severe pain at the loins; now, however, the pains relieved, the deposit ceased. As the pain at the loins subsided, the discharge from the urethra returned, in considerable quantity; with which some little straining was still felt, when the urine was drawn off. Pulse and health good.

Dec. 6. General health improved, but still no power of expelling the urine. There appeared to be certainly a small abscess, formed somewhere in the line of the urethra, although its exact seat could not be satisfactorily made out; whenever the urethra was extended to introduce the catheter, six or eight large drops of thick purulent matter flowed slowly out from the canal.

Dec. 7. Yesterday evening, the urethra was free from any appearance of thick pus, and discharged only a thin matter. This morning the instrument, passed with the accustomed care and gentleness, gave increased pain and irritation; and when it reached the bulb was stopped, and almost instantly a dessert-spoonful of blood flowed through the tube. The catheter was withdrawn, and again very slowly and gently introduced, to no purpose; and at length was given up. In consultation, the compound powder of ipecacuanha was ordered to be given at short intervals, with immersion in the warm bath. These means had by the evening so far succeeded, that the bladder had been enabled to expel at intervals half a pint of urine. At five, P. M. I again endeavoured, without effect, to pass an instrument into the blad-

der; the obstruction was in the bulbous part of the urethra, and was not to be overcome, except, perhaps, by using force. It was therefore thought more prudent to rely entirely upon medicine. All discharge from the urethra had now ceased.

Dec. 8. Bladder still full, but not very tense, or painful. Warm bath and opiates continued, pulse and general tone were so effectually reduced, that more than a pint of urine flowed by the voluntary powers, in the course of the day.

Dec. 10. Last night he voided as much as a pint and a half of urine, sometimes a quarter of a pint at once. The bladder felt more relaxed, and contained less water evidently; the treatment was therefore continued.

Dec. 20. The power of expulsion by the natural efforts now completely restored, the medicines were gradually laid aside, and the strength soon improved. Some degree of discharge continuing from the urethra, it was deemed most prudent to leave to itself. This, as his constitutional health came round, declined spontaneously; and in the course of a few months he was perfectly recovered.

CASE 70.

Retention, from Spasmodic Stricture in the Urethra; produced by Affection of Rectum.

A GENTLEMAN, 34, surgeon in the army, desired my opinion *July 30. 1821*, for a spasmodic affection of urethra, a source of much trouble to him. During many years of active service, his health had suffered much, from repeated and severe dysenteric complaints, originating in exposure to the hottest and most unhealthy climates. In the year 1813, he was ordered to Canada, where his present complaints first commenced, in frequent desire to pass water, uneasy sensations along the canal, with itching at the glans, least troublesome during the night.

In 1814, an instrument was passed, and spasm felt, at one inch and a half from the orifice; the bougie passed the first, but not the second contraction, which was at the bulb. Upon his subsequent return to England, he had the first retention of urine, from passing bougies. Finding the bladder full, without any power of expulsion, he got into a hot bath, in which he sat for near two hours, scarcely able to support the violence of pain, from the spasmodic contractions of the bladder. The water was then voided in the bath, after the bladder had been distended the whole day. He went directly to bed, perspired immensely, and was next day well.

In 1815, he had gonorrhœa, which he allowed to go off quietly, doing very little in the way of treatment.

In 1816, the difficulty in urine returned; stream variable, but always small. In *July*, retention returning, he was bled nearly to fainting, took laudanum, and the urine flowed. The following winter he suffered more than ever. Then came round the unhappy combination between the act of passing the fæces, and evacuating the contents of the bladder. While passing a stool, the urine flowed freely, but on the first subsequent occasion spasm shut up the bladder; although towards evening he passed a free and full stream again. Sometimes the water first passed, and next the contents of the rectum; and then the urine next secreted into the bladder was sure to be retained.

1817. During the winter and spring of this year he remained much the same as before. He now tried the effect of introducing a bougie anointed with soap, which was kept in half an hour. It produced a discharge, which for several weeks relieved him. The spasm would at this period prevent the passing a small bougie in the morning, but admit a large one, generally with ease, towards evening. In *March*, the retention returned. He endeavoured

to pass some bougies, which only occasioned bleeding. A professional friend then applied leeches, and bled him from the arm, in the erect position, till he fainted; a small catheter was then got in, and he was relieved. All the next day he remained quiet in bed. On the third day the spasm returned. The bowels were now purged with castor oil, a catheter introduced, and he fainted. A day or two after this spasm returned, for which he took a large dose of laudanum, and used an enema also containing laudanum. This so completely paralysed the bladder, that when the catheter was got in, the urine would not flow, till pressure was made upon the abdomen. The catheter left in, the spasm soon subsided. The urine, heretofore clear, now let fall a white powder, which however soon disappeared; and by subsequently passing some bougies, the urethra was dilated admirably.

1818. Bougies were scarcely passed three times.

1819. Passed a bougie, on one occasion, rather violently; on the following night retention came on, but by the morning all was well again.

1820. At Naples, he had an attack of gastritis, with pain on pressure, sickness, fever, full and hard pulse; this reproduced retention, which however gave way, and a large-sized catheter was introduced. In *October*, trying to pass bougies, retention again came on; a catheter passed, was left in, and the difficulty subsided.

1821. *July 30*. His complaints again troublesome, he consulted me. On hearing the history, I thought it right to inject and examine carefully the rectum, and found between eight and nine inches along the bowel a certain degree of contraction, which there was reason to believe merely spasmodic. For several days following I passed every morning a middle-sized elastic bougie into the bladder, where it was kept for half an hour; but considering that as the passage through the bowels was always perfectly free, it was not in this case expedient to take

the chance of aggravating irritation by the introduction of bougies into the rectum.

By this means the habitual return of retention was prevented. I next passed a good-sized metallic bougie daily, for a fortnight; when he found himself completely free from any return of his symptoms, having recovered the full power of voiding his urine whenever he pleased. Soon after this he left town.

Dec. 24. Very well in health; he again found the stream of urine lessened, after a stool. There had been no retention since leaving London.

May 8. 1822. Extremely well, both in health and spirits, without having been incommoded by any return whatever of his complaints.

Feb. 14. 1823. This gentleman remained well.

CASE 71.

Retention of Urine, from Spasmodic Stricture in the Urethra; produced by Affection of the Rectum.

A GENTLEMAN, aged 29, complained in *April 1820*, that horse exercise excited an uneasy sense of weight in the rectum and verge of the anus; as this continued to increase, he concluded it arose from confined bowels, dependent on some mechanical obstruction in the intestines. He said his habit was constantly costive, or rather it seemed to him the bowel had no power of discharging its contents.

In *May*, commenced a bilious disorder of the bowels, which continued several months; during which he took quantities of blue pill and calomel. He had never suffered from pain in the bowels till it was induced by the acrimony of bilious contents, which appeared to him to act especially upon what he supposed the seat of the stricture, and when under this influence he could neither retain nor discharge his urine perfectly.

This state was followed by nervous pains in the back and loins; at times unable to walk steadily,

he would fall as if hamstrung. At length suspected to have piles, he was told to sit over warm water, on which occasions he usually washed the parts, as perfectly as he could. This operation of washing relieved the symptoms, and in *Dec.* 1821, he was in the habit of repeating his ablutions several times a day; particularly as it seemed to restore circulation and power to the limbs, especially relieving a numbness he complained of in his right thigh and leg.

For some months he had passed quantities of a peculiar transparent mucus from the bowels; and while this remained in the rectum, he generally had inclination to stool, and constant desire to pass urine; but when the mucus came away, both these symptoms were relieved. Sometimes there was difficulty in passing water, when he happened to want to pass a stool on going to bed; and if a motion passed over the bidet, he was unable to pass his urine till half an hour after. Then occasionally the urine flowed involuntarily, awaking him in the night. If after a stool he walked half a mile, desire to pass water came on, and it flowed freely, but it seemed to him the urethra was restricted during the passage of fæces. If part only of the contents of the bowel was evacuated, a sort of stricture in the lower portion of the gut was the consequence, the bowel contracting and becoming closed, two, three, or four inches up; this he said he knew to be the case, because having suspected it, he had passed his finger up to the contraction, and this it was, according to his feelings, that seemed to close up the passage of the urethra.

Dec. 21. 1821. Having come to town for that purpose, he called to desire my opinion upon the seat and nature of his complaint. From the above statement it appeared to me much more probable that the cause of his distress was in the bowel than in the bladder. Filling the rectum, therefore, with tepid water, I examined and found it healthy to the extent of seven inches above the sphincter,

where the instruments were uniformly stopped by a contraction that, although firm, was not in the least painful or irritable.

This affection of the bowel I stated to be, in my opinion, the exciting cause of all the symptoms. I wished, however, to have made a second examination after a few days, but having only come up to London for a day, he said he should leave it the following morning. I advised him to do little with regard to medicine, beyond attending carefully and constantly to the regulation of his bowels, and that by the most gentle means; cautiously avoiding every thing in his diet or habits which might disturb his general health.

CASE 72.

Retention of Urine, from Spasmodic Stricture.

AN industrious, hard-working man, applied for assistance to the Infirmary in *May* 1810. He said that the first time he lost the power of passing his water was from fatigue, in 1801; and he was then relieved by drinking hot spirits and water. In 1802, a second attack proved obstinate; a complete retention for several days produced swelling and exquisite pain in the bladder; though latterly a little water dropped occasionally from him. At last obliged to complain, medicine was taken, which operated in about an hour, and removed the complaint.

After an interval of two years the complaint returned, and continued for a fortnight; he was able to get rid of his water, but with difficulty. Obligated to apply for assistance, the contraction was now overcome by mechanical pressure; a bougie was passed through the stricture, which once relaxed did not contract again.

In 1808, another attack came on, which, like the former, was relieved by the bougie.

Jan. 1810. When the retention returned, he

made known his having had it removed by the bougie, upon which one of good size was introduced, but would not pass the stricture. The pressure by which the instrument was urged forward was rather considerable, but to no purpose. A trifling bleeding followed. Opiates and the warm bath completely relieved him in twelve hours.

May 1810. His complaint returned. A bougie of moderate size stopped at five and a half inches, was so firmly grasped by the urethra, that to withdraw it required a force equal to more than a pound weight. The warm bath, with repeated doses of the compound powder of ipecacuanha, aided by a day's rest, enabled him to pass his water freely.

Towards the end of the month complete retention returned; as rest was indispensable, he was advised to come in, and did so on the 21st. His former treatment now failed, till on the 24th he began to pass a little water. He now complained of an inflammatory swelling upon the last joint of his little finger, with extreme tenderness over the whole of the left hand. The hand was well fomented. His urine passed in a small stream, with much exertion and straining. In the evening the stream was observed to be much more full and free.

On the 25th the hand much worse, the pain with great violence darted through the fore finger of the right hand. Both hands were fomented. In the course of the evening the right hand was as severely affected as the left. The urethra now was so much relaxed, that the urine flowed with scarcely any straining. He observed that immediately the pains came on in his hands, he felt the complaint in his bladder begin to mend.

He this day complained of his right knee, extreme heat, pain, and swelling; and on the 28th his left foot became painful and inflamed. With some pain in the head, the pulse was small and hard, at 112. In his right knee there was evidently a considerable effusion of fluid, into the capsule of the

joint, floating up the patella. Integuments somewhat tumid, motion gave extreme pain. By rest and diaphoretics he soon began to mend; but on the 9th of *June* his retention returned with extreme urgency of desire to empty his bladder. This attack, it is curious to remark, entirely and spontaneously subsided in two hours. *June 23.* Violent inflammation came upon his hands, without any correspondent relief to the complaint in the urethra. The former treatment was repeated.

Sept. 24. He experienced another attack of complete retention. The following morning he came to me in great pain. Bougies and flexible catheters failing, I desired him to go home, wrap himself in warm blankets, and take ten grains of the compound powder of ipecacuanha every two hours, till he was relieved; by these means his complaint was in the course of the day removed. He remained pretty well till *Nov.*, when the irritation and spasm suddenly returned in full force upon the urethra; and he was again relieved by the same means as before.

From this period he enjoyed tolerably good health till the latter end of the following year.

In *Sept. 1811*, he was again confined to bed for nearly four months by a most severe attack of his old complaints, in his joints and limbs. For more than two months he could neither stand, move, nor feed himself. The stricture during this interval was troublesome, repeatedly preventing for a day or two the passing his water, without great difficulty; but when the symptoms of rheumatic gout began to subside in his limbs, a most distressing degree of irritation settled itself upon the bladder. The desire to pass water was now extremely frequent, as well as violent. Sometimes, notwithstanding the warm bath, opiates, and other medicines, he was for two or three days together unable to void a drop, with straining severe beyond description. He recovered so slowly, he was not able to go to work till the end of *December*.

In *Dec.* 1813, he was again, from his old complaints, deprived of the use of his limbs; all the joints of his fingers and toes being severely affected, but the first joint of the left little finger most particularly. This attack produced more heat and swelling than any of the former, threw out chalky matter, and was, in the little finger, followed by ankylosis of the joint. As he never could be persuaded to allow of any regular or continued treatment for the further relief of the stricture, that contraction, formerly pure spasm, became, to a certain degree, a state of permanent obstruction. He was generally able to get rid of his water, but always in a small stream, and sometimes with great difficulty.

Jan. 1816. Again in the infirmary; he remained several weeks entirely helpless, from the gouty affection of his joints. The stricture was much as usual.

The foregoing account illustrates the circumstances under which spasmodic stricture may commence, exhibiting the symptoms that generally usher in the change from a spasmodic to a permanent contraction. While the affection was pure spasm, no mechanical force would overcome the obstruction, although it might with certainty be removed by antispasmodic and diaphoretic medicines. But as the state of things changed, the remedies that, at first, never failed, operated with diminished power, and latterly, lost their effect altogether.

Feb. 1819. The stricture being still a source of perpetual distress, he allowed me to pass down, first, a plain bougie, and then one with the kali purum, to a contraction at four inches and a half. From this, he felt an aching and heat, and when removed, bleeding to the extent of an ounce followed. After this, he made water easier than for many weeks before.

March 27. Bougies of several successive sizes

were passed with ease through the stricture, which he now felt little from; and subsequent to this, it never produced any return of retention, though I occasionally saw him for his gouty complaints, till at length, enfeebled by continued suffering, he died, *Aug. 2. 1821.*

Obliged, after overcoming several difficulties, to examine the body alone, upon the floor of a very dark and close cellar, the enquiry was made under disadvantageous circumstances. His death had been hastened by severe gouty pains flying about his stomach and bowels; but I could ascertain no particular change in these parts. The effusion of chalky matter was found to have taken place upon the cartilaginous surfaces of most of the joints of the hands and fingers; but most abundantly and extensively into the cellular texture of the periosteum, and particularly into the cellular membrane of the ligaments, and capsules, of the joint. The large tumor and stiff joint of the metacarpal bone, with the first phalanx of the indicator, was produced by a great accumulation of this matter in the cellular membrane, and also in the theca of the tendons. On subsequent maceration, the first joint of the little finger was found perfectly ankylosed, and a part of each spongy end of one of the metacarpal bones absorbed; a small quantity of urate of soda was deposited in the space, though it lay loose. The bladder and urethra were brought away. On opening the bladder, there was no appearance of disease; but in the urethra, at different points, were several impressions, from attempts to pass bougies. The spot to which the kali had been applied was just visible, the contracted circle appearing to have been perceptibly eroded, for the breadth of a thread.

CASE 73.

Retention, from Spasmodic Stricture, with Disease of the Prostate Gland, and Vesicula Seminalis.

A MAN, aged 66, applied to me in *Feb.* 1817. He said he had for some years observed a progressive diminution in the stream of urine; but little attentive to himself, had not felt much inconvenience till *June* 1816, when the efforts to pass water were frequent and distressing. In a violent fit of straining to empty the bladder, he felt a sudden gush of water backward by the anus, which, at first, he could not understand. He, however, felt relieved, and for the next three months, his urine principally passed off by the bowel. The opening was then supposed to have closed, as the urine came entirely by the urethra; voided with difficulty, about every two hours.

Jan. 14. 1817. His complaints had increased; and in straining to empty the bladder, the urine again burst through as before, into the rectum, continuing to flow by the bowel, with tenesmus, and irritation at the neck of the bladder. A small plain bougie stopped at four inches and a half, but he suffered so much from this, that he would not hear of any other application.

March 17. His complaints were progressively increasing, the urine still passing through the bowel. The distress from irritability of the bladder, urethra, and intestine, allowed no respite; notwithstanding opiates, and other anodyne medicines, calculated to afford relief. The rectum was now examined, but I could not perceive any manifest enlargement of prostate gland, although there was reason to believe it was diseased. His extreme silence and reserve, however, prevented any very satisfactory opinion being formed, upon his complaints, which were, however, attended with most distressing irritation.

April 19. In every respect worse ; and evidently declining fast, I repeatedly, but in vain, proposed to pass bougies into the bladder. Thus obliged to rely on medicine alone, he continued to sink ; and died the 19th of *May*. With great difficulty, his wife agreed that I should examine the body.

Upon dissection, the bladder was found scarcely at all thickened, but healthy, excepting a number of minute stellated appearances on its internal surface, some of a dark-grey, others scarlet, and a few towards the neck of the bladder, that were covered with little patches of effused lymph, like millet-seed.

The urethra was free from stricture, and large, all the way to the membranous part, where some degree of stricture still remained ; although the principal cause of obstruction, during life, had obviously been pure spasm.

From the general feel of the parts, on their removal, it was presumable the prostate gland was enlarged. But the careful and patient dissection of the parts at length completed, proved that the whole tumor was the result of a very enlarged and indurated state of the left vesicula seminalis. Its texture was firm as gizzard, and it was so altered in appearance, that the true seat of the disease could be determined only by tracing its connections. A longitudinal section was made, laying it open, and it then appeared that the coats of the vesicula were exceedingly thickened. The cellular cavities within, much enlarged, were filled with a pale yellow cheesy substance, more consistent than scrofulous matter generally is, yet resembling it.

The opposite vesicula, towards its opening from the vas deferens, was becoming thickened, although its further extremity was unaltered, the cells exhibiting no trace of coagulable deposit ; but, on the contrary, partly filled with the thin brownish fluid natural to these cavities.

The greatest part of the substance of the pros-

tate gland was destroyed by ulceration. The caput gallinaginis was in a natural state, but on each side the middle line in the prostatal part of the urethra a large opening had formed into the abscess within the gland, the cavity of which was coated with coagulable matter, resembling that produced in scrofula.

From the posterior part of the prostatal abscess, a small opening had ulcerated into the rectum; the perforation in the intestine being situated about an inch within the sphincter. The surface between the ulcerated opening and the external orifice of the bowel had the appearance of irritation, and contained a cluster of enlarged and varicose veins.

The left vas deferens towards its termination was enlarged, and filled with a matter similar to that with which the corresponding vesicula was loaded, its coats at the affected part much thickened.*

SECT. XIX.

Of Retention, from Permanent Stricture.

608. WHEN the long continuance or severity of the symptoms from spasmodic stricture, or other cause, have led to the circumstances above mentioned (605.), they are usually attended with a degree of permanent contraction in the urethra, to which may be occasionally superadded, attacks of severe spasm, with other sympathetic affections already described, by the joint operation of which, several new consequences of disease are progressively brought forward.

609. The continued irritation from the stricture excites perpetual uneasiness and discharge from the anterior part of the urethra. The constant exertion and aggravated straining to empty the bladder, is productive of distention, irritation, and inflammation in that part of the urethra between the bladder and the stricture; and the inflamma-

* The disease is preserved in Mr. HEAVISIDE'S Museum.

tion and mischief thus excited frequently proceeds to a considerable extent, spreading itself to the surrounding parts.

610. It is by this means that nature, when unassisted, seeks to relieve herself in the formation of a new passage for the urine, and this effort generally to a certain extent succeeds, inasmuch as it averts present danger, which otherwise might, in a few days, prove fatal; although in its subsequent consequences, the remedy proves sometimes almost as formidable as the disease.

611. The mode in which these changes are brought about, is the following. The frequent and almost unavailing efforts of the bladder, keeps up a constant pressure of urine against the sides of the urethra behind the stricture, in consequence of which this part of the canal suffers progressive enlargement; but the cause continuing to operate, the effect does not stop here. Irritation supervenes, and this imperceptibly runs on to inflammation, frequently followed by effusion of coagulable lymph upon the internal surface of the urethra. Ulceration of some part of the inflamed surface subsequently takes place, and the urine making its way out into the cellular membrane surrounding the urethra, gives rise to an œdematous tumor in the perineum, scrotum, or both. In this way irritation from urine effused into the cellular texture, commonly excites inflammation beneath the integuments, inducing in its turn either abscess, or mortification, according to the prevailing state of constitution.

612. Where matter thus formed becomes soon apparent, and is promptly let out, the complaint may take a favourable turn; and, provided the powers of the constitution are not too much exhausted by previous suffering, the excess of local irritation subsides. The health improves, the appetite returns, and the unhealthy cellular membrane separating, the ulcerated parts contract; and

all that may ultimately remain may be one or more small fistulous openings in the perineum, by which for a time the urine may continue to be more or less freely evacuated.

613. The morbid appearances produced by stricture in the urethra are extremely various. Where active inflammation of a considerable extent of the anterior portion of the canal, from injecting for gonorrhœa, has been brought on, it generally induces permanent thickening of the coats, and permanent contraction of the canal of the urethra. (Case 53.)

614. Where the cause has been some external violence, or contusion, the severity of the subsequent complaint will depend on the circumstances of the accident, and the propriety of the early treatment. Severe bruise, followed by the destruction of some extent of the urethra is commonly productive of a very troublesome stricture, in the seat of the injury; the newly formed parts having a constant tendency to contraction, very difficult to keep in check. (Case 50.)

615. When stricture assumes its most ordinary seat, in the bulbous or membranous portions of the urethra, the extent of the contraction is almost always very small; and although during life the whole system of the urinary organs may have had their functions disturbed by an almost complete retention, yet should the contraction prove to be spasm, scarcely any distinct trace of it may be found on examination after death.

616. Stricture, subjected to occasional attacks of irritation or inflammation, generally becomes by degrees more compact in texture, and more permanent in character; and where a contraction in the urethra, producing symptoms of permanent stricture, has been of many years' standing, it sometimes acquires the firmness of cartilage, and may become so nearly impervious, as with difficulty to admit the passage of a common bristle.

617. It is in these latter stages of the disease

that the consequences adverted to (609.), are liable to occur, leading to the production of urinary abscess; the appearances of which, as will be seen by reference to the cases, are merely those of ulcerated cavities in the indurated and diseased cellular substance, with fistulous openings from the urethra into the abscess, and from the abscess outwardly through the external integuments.

618. Of these diseases, numerous and rare specimens, exhibiting all their varieties of character, are to be found in the Museum of Mr. HEAVISIDE. Some valuable examples of these complaints, and their consequences, may be seen in the Museum of the Royal College of Surgeons; and many interesting preparations, illustrative of stricture in the urethra, I have also had the pleasure of examining in the Military Collection at Chatham.

619. Where there is reason to fear the more distressing consequences of stricture in the urethra, they can only be prevented by affording timely relief; when, however, the urine has once forced its way into the cellular membrane, producing inflammation and abscess, even the removal of the obstruction in the urethra will not always succeed in relieving the complaints derived from it.

620. One of the latest and most distressing sympathetic complaints to which stricture in the urethra occasionally gives rise, is a sudden attack of violent shivering, succeeded by feverish heat and sweating, — an attack which is generally of so intense a character as to create on its first appearance considerable alarm for the safety of the patient.

621. This affection is not unlike the paroxysm of ague, but it is much more severe, and sometimes attended with delirium. It is frequently the result of the application of caustic, and, like the hæmorrhage that now and then occurs under the same treatment, has been considered a favourable circumstance, as an indication that the stricture is about to give way.

622. In the treatment of stricture, it has been

observed that the bougie is the most appropriate means of relief, and in fact all that is adviseable to recommend, while the moderate irritability of the urethra admits of its adoption. (604.)

623. With regard to the comparative merits of the different kinds of bougies, there have been various opinions. The common wax bougie is that which, till lately, has been in most general use, and for several reasons I think it frequently merits a preference. Some surgeons are in the habit of using bougies formed of catgut; and in very contracted strictures, that refuse to admit the smallest-sized wax bougie, the catgut bougie often proves useful, and may be applied with advantage.

624. It has been objected to the common bougie, that it loses its proper firmness when allowed to remain for any length of time in the urethra; but this objection applies in a much greater degree to the bougie of catgut, which absorbs moisture rapidly, swelling, and untwisting its fibres to that extent as to occasion sometimes considerable distress at the neck of the bladder, and producing great pain when withdrawn.

625. The bougie of elastic gum is infinitely less liable to these objections, than either the catgut, or the common bougie; and it appears to me, that in cases where stricture is connected with affection of the prostate gland, the gum elastic is preferable to the wax bougie; at least, I have found it upon trial, in several such instances, answer much better; passing through the stricture with more ease, and slipping over the projecting parts of the enlarged prostate, with less uneasiness to the patient. The elastic bougie rarely excites irritation, which often renders the introduction of the common bougie improper, a circumstance attributable only to the superior smoothness and softness that enables the elastic gum to follow with comparative facility the course of the canal.

626. One quality held desirable, is the power of receiving and retaining any particular degree of

curvature chosen, and upon this ground principally the metallic bougie has been introduced into practice. This bougie, at first view, might be expected to answer very well, but it is, notwithstanding, in my opinion, a most objectionable instrument. In occasional instances, these bougies have broken in the urethra, a part has escaped into the bladder, and it has been necessary to save the patient from the ill consequences of increasing irritation, and inflammation of the bladder, by cutting it out, by the operation for stone.

627. It has indeed been asserted, by those who recommend metallic bougies, that even should this accident occur, there would be no difficulty in dissolving and bringing it away, by injecting a quantity of mercury into the bladder, which it is said, will form an amalgam, and the whole being thus rendered fluid, will come away by the urethra. That this effect would take place in an elaboratory is very certain; but that the same result would follow within the bladder, in the living body, appears to me extremely doubtful, where there is not only the urine, but the various mucous secretions from the kidneys, ureters, and bladder, which matters it is well known, have a strong tendency to form a precipitate, in the course of a few hours, upon the surface of any extraneous body introduced into the bladder; a circumstance which must interfere with, or prevent, the mutual action of the metals upon each other.

628. In using the bougie, the point somewhat incurvated upward, and the instrument lightly rubbed with oil, to be passed gently down the urethra until it stops at the seat of the contraction, a moderate degree of pressure is then to be made against the stricture, and continued for a short time; but should the instrument not then pass, it must be withdrawn, and one a size smaller substituted. It will thus be ascertained, what particular sized bougie is most suitable to the degree and tone of the contraction.

629. The bougie determined upon for use, should be so large, as to pass the stricture by the aid of a moderate degree of pressure; the period for which it is allowed to remain, must be regulated very much by the feelings of the patient, and the same rule must also direct from time to time, an occasional increase in the size of the instrument.

630. In the use of the bougie, however, it has been already shown, that the least deviation between the line of pressure, and the natural course of the canal, at the part where the point of the instrument may happen to be, is sure to do harm, invariably tending to lay the foundation for, if not actually to produce, a false passage; and the instance already adverted to (556.), where this took place, proves that no person is equal to the task of introducing bougies for himself, without some risk of getting into this dilemma; which, besides other inconveniences, frequently proves an endless source of embarrassment to the surgeon, when at some future time, it may be essential to the safety of the patient, that an instrument should be got into the bladder. Wherever a false passage has been made, it is sure to catch the point of any instrument that is passed, rendering it extremely difficult afterwards to introduce either bougie or catheter, however urgent the occasion.

631. Sometimes, from the unjustifiable attempts of ignorance, the patient is exposed to the most serious effects of violence of this kind; a striking instance of which, occurred lately to the notice of my friend Mr. SPILSBURY, of Walsall, to whom I am indebted for the following particulars. A young man, urgent to pass water, but unable to make any, applied to the nearest practitioner, who hastily passed an instrument, using much force; great pain, a cupful of blood, but no urine followed. He sought larger instruments, but happily found none. Medicines were ordered, but the night passed without relief. The next morning

ushered in the practitioner, with an instrument sufficiently long to reach the bladder; declaring he had failed only from this cause. Increased violence now used, more than a pint-basinfu! of blood flowed, but no urine. The poor man was, however, comforted, by hearing it was all for his good, and that, but for the loss of blood, he would have lost his life, was told, that he was certainly much relieved. The day after this, left to his medicines, shivering, followed by drowsiness, came on. In this state, on the third day of the retention, Mr. SPILSBURY was earnestly requested to see him. On being roused, he was able to put out his tongue, which was dry and furred; but he sunk directly again into a doze. His safety evidently depended on emptying the bladder, but the violence of his struggles required five men to restrain. A catheter, however, was introduced, and at the membranous part the wound in the urethra was felt, and a false passage found; all but driven into the rectum. The opening lightly pursued, the point of the instrument, by the finger in the bowel, was felt all but through the coats of the gut. Withdrawing the catheter, and then keeping the point close against the pubes, it slipped readily into the bladder, and four pints and a half of dark-coloured urine were drawn off. In three hours, the pulse rising, he was bled from the arm, and his bowels opened. In the course of the night, the catheter slipped out, but was easily re-introduced, and kept in for several days; during which period, a smart attack of peritoneal inflammation was relieved by free leeching, warm bath, and other proper means. In a few days, the power of passing his urine having returned, he was able to leave his bed, and soon perfectly recovered.

632. The method of passing an instrument, so as to most probably avoid the difficulty of getting its point entangled in any false passage that may exist, is demonstrated by the morbid anatomy of

the parts. We find almost invariably, that when a false passage is produced in any part beyond the curvature of the urethra, it is on the posterior side of the canal; and consequently, if the instrument has sufficient firmness to admit of its point being pressed against the opposite, or anterior part of the urethra, in its way into the bladder, it may slip past the opening leading out of urethra, and thus reach its destination in safety.

633. The frequency with which the operation of passing a bougie should be repeated, must depend very much upon circumstances. Should the stricture be in an irritable state, and the retention of the bougie in the urethra painful, it may not be proper to repeat it at a shorter interval than a few days; but if no uneasiness be produced, an instrument may be introduced every day.

634. The length of time the bougie should be kept in the stricture, must be also regulated by the feelings of the patient, and the sensations excited in the parts. One minute being long enough in some cases, while two hours is a convenient period in others.

635. Should repeated attacks of aggravated spasmodic contraction have rendered a stricture exceedingly distressing to the patient, perhaps inducing irritation at the neck of the bladder, it may be unadvisable to meddle with the stricture, unless in the most gentle way possible. The degree of irritation in the bladder may forbid any but the most cautious measures. The strictured part of the canal may be nearly impervious, but it may still be necessary to confine the treatment almost entirely for a time to the exhibition of opiates and diaphoretics, the use of the warm bath, and other means known to succeed best in relieving irritation, and removing spasm.

636. Where stricture becomes so irritable as to prevent the use of the plain bougie, while treatment is nevertheless indispensable; should the extreme

irritability of the parts be such as not to endure the introduction of a bougie at all, it may be advisable to bring the constitution at once under the continued influence of a series of opiate and anti-spasmodic medicines, enjoining absolute quietude and confinement to bed. (Case 69.) In a few days the symptoms may relax in severity, and it will then be right to make an application locally that will still further assist in lessening the irritability, and diminishing the tone of the stricture.

637. The application proposed is the kali purum, or caustic vegetable alkali, a small particle of which, the size of a common pin's head, let into the point of a soft wax bougie, is to be passed quietly but quickly down to the seat of the contraction, and allowed to dissolve there, by pressing it for a minute against the stricture. The usual sensation experienced from this application, is a temporary feeling of glowing heat, rarely severe. The usual effect, is immediate relief to the symptoms.

638. In some instances, a single application of the kali purum to a very irritable stricture, has for a day or two not relieved, but rather aggravated the symptoms; but in every such case, as far as my experience goes, the irritation, by the proper use and management of anodyne medicines, has afterwards diminished rapidly, leaving the patient very much better than before the operation. The stricture under this influence at once changes its characters, and not only then, but usually for a long time afterward ceases to be at all troublesome. (Case 76.)

639. I have, in some few instances, examined the urethra after death, where this remedy had been applied, and from being able to perceive scarcely the least change in the smooth surface of the fine membrane, have had the clearest evidence that the only material power it exerts is that of changing the temper and diminishing contraction in the stricture; provided the application is made with care, and the operation is performed by one who regards his

patient's future comfort, as well as his own reputation.

640. Where the stricture is contracted, but not irritable, refusing to admit the smallest bougie, the kali purum will be equally proper, and will generally be found equally useful. (Case 82.) A single application will, in many instances, be sufficient to afford a very considerable degree of relief, obtaining a perfectly easy passage for bougies, that previously could not by any justifiable degree of force be made to enter the stricture; and enabling the practitioner, in many cases, to proceed afterward with the plain bougie, in progressively dilating the contracted part of the urethra.

641. I am not aware that the rationale of the action of the caustic alkali in stricture, has ever been entered upon farther than by stating the fact of its tending to relax spasm, and diminish irritation; it appears to me, however, that the principle upon which it operates so powerfully, is clearly the same that I have already endeavoured to explain in the effects produced by the internal use of alkalies, in relieving an irritable state of bladder. (228.)

642. The above, is the only preparation of caustic that I have now for some years had occasion to use; and I am disposed to believe, that very few instances of stricture occur that may not, under proper management, be rendered tractable by this means. Mr. HUNTER, it is true, occasionally applied the lunar caustic, and Sir E. HOME's extended observation was the means of establishing the character of this practice. It appears now, however, to be less generally adopted than formerly; and within the circle of my own observation, it has certainly appeared practicable to relieve these complaints by other means, not productive of the injuries or inconveniences that do occasionally follow from this application.

643. The permanent relief of the stricture, most commonly includes that of all its symptoms, or con-

sequences. The irritable bladder, frequent desire, and straining to pass water, the distress from the continual escape of urine from fistulous openings, and the discharge from abscesses, in perineo; all these ills, and occasionally others, experience a spontaneous improvement, on bringing about a comparative freedom in the passage through the urethra. (Case 88.) Where, however, the early stages of abscess in perineo require attention, its treatment must be regulated upon the principles laid down for the management of tumor from contusion of the urethra. (504.)

644. As to the treatment required for the relief of the feverish paroxysm which occasionally attacks those who are labouring under stricture, it is very simple. The patient should be immediately laid in a warm bed, and drink plentifully of hot tea, or hot spirits and water; or if the moderate severity of the attack will allow, he may first take an aperient draught, with a view to clear the bowels, and subsequently a pretty strong dose of opium; so as to favour the establishment of a copious diaphoresis, which generally effects a solution of the attack.

645. The consequences of complete retention have been, in some rare instances, very curiously developed, in the appearances observed where a child, at birth, has died from mal-formed and imperforate urethra. The uniformity in the state of the parts, in repeated examples, lead on to a conclusion, in a physiological point of view at least, important; inducing, in the reflecting mind, an admission of the extreme probability, if not certainty, that in the human foetus urine is not only secreted, but voided, for some time previous to birth.

646. In *October* 1810, I was requested by my friend Dr. MERRIMAN, to open the body of a male infant, born alive in the 8th month; it languished, apparently in pain, and died the same evening.

The feet were distorted, the anus imperforate, and the lower part of the abdomen occupied by a

large circumscribed tumor. Dividing the parietes, this tumor protruded, white, elastic, and filled with a fluid. On each side of this tumor was a long membranous tube, large as the finger, and curiously contorted; these, also, were evidently filled with a fluid. The central cyst was comparatively dense, firm, and opaque; the convoluted tubes much thinner, and nearly transparent. The tubes terminated above, on each side the loins, in what appeared to be a mass of small hydatids; below they passed into the pelvis, with the principal tumor. These parts engrossed nearly the whole cavity of the abdomen; the other viscera forming a very small proportion of its contents. These singular appearances were produced by the bladder, ureters, and kidneys, having been subjected to the effects of excessive distention, from accumulation of urine. The parts were removed; but before this could be done, it was found necessary to puncture the bladder, when a jet of clear limpid urine sprung forth with violence. The kidneys, ureters, bladder, and urethra, were then dissected out, and the difficulty cleared up, by examining the urethra. On passing a large bristle from the external orifice, half an inch along the canal, it was found to be imperforate; and by introducing a fine silver probe in the opposite direction, into the urethra, from the cavity of the bladder, it appeared, that the canal was impervious for the extent of a quarter of an inch. The quantity of urine contained in the bladder alone, was at least seven or eight ounces. The coats of the bladder had attained a very extraordinary degree of strength and thickness, probably to resist distention. It had, notwithstanding, given way posteriorly, where a large pouch, or cyst, was formed. The convoluted appearance of the ureters was as remarkable as their great increase in magnitude. The kidneys resembled a congeries of small hydatids, no larger than garden peas; loosely connected together by a cellular texture. There was no visible

remains of, nor any appearance at all, resembling the natural structure of the kidneys; yet, from considering the appearances, it was clear, in my opinion, they must have continued to secrete urine, till the infant died; an event probably consequent to continued pain and irritation from the state in which the urinary organs were found, on dissection. This singular preparation is preserved in Mr. HEAVISIDE'S Museum.

647. Dr. IVANOVE, a most intelligent young physician, from St. Petersburg, in looking over my portfolio, upon seeing the drawings I had made from the above preparation, acquainted me, that he had dissected a child born at the full time, who lived forty-eight hours; where the urethra imperforate, the bladder was much, but the ureters still more distended with urine. It was supposed, by those present, that these changes might have been the result of secretion after the birth.

648. In the following similar instance, for the particulars of which I am indebted to Mr. BRODIE, "a male foetus, of nearly the full time, was brought into the dissecting room, in whom the external orifice of the urethra was deficient, in consequence of original malformation. The bladder was found moderately distended with urine; the ureters were also distended with urine, as were the infundibula and pelvis of each kidney. The urine was examined by Mr. BRANDE, who found it to have the other properties of urine, but to have no uric acid in its composition."

CASE 74.

Retention, from Permanent Stricture, relieved by Puncture of the Bladder.

A GENTLEMAN, aged 32, visited me on the afternoon of *February 9. 1818*, in great distress, having passed no water since the early part of the morning. He had for the last few days perceived increasing

difficulty, but had never entirely lost the power before. I passed a small silver catheter, and found irritability and contraction at the bulb; it was passed with ease, and drew off two full pints of urine. I directed him to take the compound powder of ipecacuanha, in a draught night and morning.

The following day, *Feb.* 10. I drew off the urine, as before. He complained of cold and face-ache. *Feb.* 11. This morning he tried to pass his water, and with some difficulty voided a little. In the evening I endeavoured to pass the catheter, but failed. An elastic gum bougie was therefore passed down and allowed to remain in the stricture, while I prepared an elastic catheter one size smaller than the bougie; the moment the one instrument was withdrawn, the other was introduced, and by this means passed into the bladder with ease. The anodyne draught, as before, directed to be repeated at short intervals, enabled him again to pass his water by the natural efforts. During the use of this medicine, a copious perspiration coming on, removed the attack of cold and face-ache, relieving at the same time the contraction in the urethra.

Jan. 9. 1819. Called on me in the evening in great pain, having passed no urine since the morning, and then only in drops, with straining and difficulty. I was partly aware of the state of the stricture, having many times in the course of the preceding year been called up at night, to draw off his water. I tried the smallest-sized flexible bougies and catheters, but could not pass them. I therefore directed him a powerful anodyne, to be taken immediately, and repeated in two hours; after which I called on him at his lodgings, and endeavoured again without success to pass an instrument. The pain and spasmodic irritation from the distended bladder were now productive of such extreme distress, that I promised to give him relief on the following day, either by an instrument or by an operation.

Jan. 10. At noon Mr. HEAVISIDE and myself paid him a visit, and we both failed in endeavouring to introduce either catheter or bougie by the urethra. The bladder was sufficiently distinct above the pubes, but on examining, I was led to prefer puncturing by the rectum.

The patient was laid on his back, the perineum presenting, as in the operation for the stone. The fore-finger of my right hand then passed into the rectum, and the canula of the curved trocar introduced upon it, I adjusted the position of the instrument, fixing the end of the tube in the hand against that part of the bladder where the puncture was to be made. I then introduced the stilet, and pressing the point home, passed the whole instrument forward through the bowel into the bladder. The stilet removed, three pints of urine were drawn off, to his infinite relief and comfort; the canula, secured by a proper bandage, was allowed to remain in.

Jan. 11. Doing well. On paying my evening visit, I found he had suffered much pain and irritation, and had passed a considerable quantity of urinous and bloody fluid by the anus, and had also voided with great straining by the urethra, in spasmodic starts, eight or ten ounces of nearly pure blood. The pulse was at 90, with much thirst, but a clean tongue, and no material tenderness on pressing the bladder externally. I now withdrew the canula, desired him to take linseed tea, and directed sixty drops of laudanum with five grains of antimonial powder, in a draught, every six hours.

Jan. 12. Had passed a good night, and this morning had a small easy stool; very little urine passed by the rectum, while on the night-chair, but during the day a full pint of urine flowed by the urethra, an ounce or two at a time, with fits of straining, much less violent than he had been formerly accustomed to. The urine deposited a small quantity of yellowish purulent sediment, with specks of red blood. Pulse full, soft, 100; skin freely per-

spirable, tongue clean; without the least remaining tenderness in the region of the bladder. In a note he sent me this evening, he observed, "I feel very little alteration since the morning; the pain in making water is severe, and it comes in small quantities, a table-spoonful at a time. The bloody discharge has ceased, and it is now deep-coloured water."

Jan. 13. In the course of the day he passed by the urethra above a pint of high-coloured urine, none by the rectum. He took castor oil, which operated comfortably. The anodyne was repeated.

Jan. 15. The urine now almost perfectly natural. He could pass with little effort two ounces in a very good stream. The urine still somewhat turbid, with the appearance of white powder in small quantity, subsiding to the bottom.

Jan. 17. Retained his urine eight or nine hours, and had slept soundly through the night.

On the 23d, passed a small-sized elastic gum bougie with some difficulty through the stricture; and now perfectly recovered from the operation, I pointed out the propriety of his having the stricture attended to. Engagements, however, obliging him to leave town, prevented this, and I took my leave.

August 1822. I had the pleasure of seeing this gentleman, who told me that since the time of the operation his complaints had given him no trouble.

CASE 75.

Retention, from Permanent Stricture.

A MAN of weak and irritable habit, aged 44, applied for relief to the Infirmary, *March 20. 1819*, for a retention of urine. In extreme agitation and distress, he said he had not passed a drop of water since the morning of the preceding day, and was in the most severe pain. The bladder high in the abdomen, would not bear the least pressure. A very

small wax bougie was stopped by a stricture, near the orifice of the urethra, and it appeared that when with difficulty a bougie was passed along the canal, it was in a state of uniform contraction for near two inches from its external opening.

He was directed to be immediately put to bed, to have ten grains of the dovers powder every three hours, and to be immersed soon as possible in the warm bath; and Mr. HEAVISIDE desired me to see him in the evening, to puncture the bladder if necessary. On my evening visit, however, I found he had three times passed water, having voided in the whole near two quarts of urine. He expressed himself infinitely relieved, and very thankful, and was directed to remain quiet, and to take another of the powders on the following morning.

March 23. Much improved, and able to pass his water now in a steady good stream. I introduced a small-sized elastic gum bougie into the bladder, with some hesitation for the first two inches, but none beyond. He was so far recovered, that he requested, on account of his family, he might return home, and was therefore discharged.

CASE 76.

Retention of Urine, from Permanent Stricture.

IN *October*, 1818, I received a visit from a gentleman who had come over to me from Dublin, on account of stricture in the urethra. The stream of urine had for some time become progressively diminished, and occasionally it was passed at short intervals.

The smallest-sized bougie of elastic gum, supported by a copper wire, ascertained a contraction at five inches and a half, which it just passed through, not without hesitation, but without pain. The same bougie was introduced daily for a week, and then one a size larger during the second week, when a third size was passed with ease. Under this im-

provement, I found he was so well acquainted with the management of bougies, he might occasionally pass one himself; seeing no necessity for his remaining longer in London.

The following year he visited me again, when it was necessary to go over the old ground, which again brought the stricture into a comparatively relaxed, and much improved state. In 1820 I had the pleasure of seeing this gentleman again; bougies were passed, and the symptoms relieved.

Oct. 18. 1821. He again visited London, when I found it necessary to apply the kali purum, the stricture refusing any longer to admit a bougie. He said he had, of late, felt rather a want of power to retain his urine, with very frequent desire to pass it, and yet difficulty in voiding it. A composing draught was directed for bedtime.

Oct. 19. The caustic had given little pain, exciting only a temporary sense of heat in the part. During the night, desire to pass water coming on, he had got up, and strained without effect. He then introduced the smallest of his own bougies, pressing it down to the stricture; by this means, he was enabled to pass a tea-cupful of water, much to his relief. Notwithstanding his anodyne, he had passed a bad night, with uneasiness in the stricture, pain in the region of the bladder, and about the back and loins.

Introducing the smallest elastic gum bougie down to the stricture, it passed on to the bladder. In five minutes it was withdrawn, and one a full size larger was passed with equal facility, directly and freely into the bladder. In ten minutes, it was removed, when he felt a desire to pass water, and voided near two pints of urine in a fuller and better stream than, for years before he could at any time have done. At the bottom of the chamber-vase was a small coagulum of blood, as large as a small pea.

Oct. 20. Had slept indifferently; but every symptom relieved, compared with the preceding night. The bougie passed the day before was again introduced; but with somewhat less facility.

Oct. 26. He called, and acquainted me that having been on a visit to a family at Highgate, he had been several days confined with most intense shiverings and fever. No bougie was passed to-day, as the water flowed freely. I thought it more proper to direct an anodyne with the compound powder of ipecacuanha, and tincture of opium, to be taken at bedtime. This proved exceedingly useful.

Oct. 27. The larger-sized bougie passed into the bladder with ease and comfort. He took a gentle aperient; and had only occasion to void his urine twice in the course of this day, and not once through the following night.

Oct. 30. All uneasiness and frequency in passing his water having subsided, and finding he had the power of introducing a bougie four sizes larger than the smallest with ease into the bladder, he felt every satisfaction in being told he might fix his day for returning home, and accordingly took leave.

Oct. 1822. Being in London, my patient favoured me with a call to assure me he had not enjoyed such uninterrupted good health for very many years, as within the last twelvemonth; not having been once during that period incommoded by his old complaints.

CASE 77.

Retention of Urine, from Permanent Stricture.

Sept. 22. 1821, a man, aged 51, applied for relief at the Infirmary, having had frequency and difficulty in voiding his urine for the preceding six months; often obliged to pass his water every half hour, he was occasionally unable to void a drop. I directed him ten grains of the compound powder of ipecacuanha every night.

Sept. 25. Symptoms somewhat relieved, medicine continued.

Sept. 29. The smallest-sized bougie passed down to the stricture, at the bulb, would go no further; I therefore thought it right to apply the kali purum.

Oct. 2. His complaints much better. He now passed his water only every two or three hours; medicine continued.

Oct. 9. I found an elastic gum bougie, the diameter of a large crow quill, passed with ease through the stricture into the bladder. The medicine was directed to be continued.

Oct. 13. The passage of the urethra felt sore; but the stream of water was much more free than before.

Oct. 16. I passed the former bougie again through the stricture.

Oct. 27. He now made water with ease and comfort, about every four hours; the medicine was continued.

Nov. 13. He observed that he was now commonly disturbed once or twice after going to bed; but used formerly to be obliged to get up sometimes as often as every ten minutes through the night to pass his water, and then perhaps scarcely able to pass any. He was recommended to continue his medicine some time longer, which he reluctantly promised to do, but I saw no more of him.

CASE 78.

Retention of Urine, from Permanent Stricture.

Sept. 8. 1821. A man, aged 70, applied for relief at the Infirmary. He said that for the last thirty years he had found occasional difficulty in getting rid of his water, sometimes amounting to retention. Bougies and medicines had from time to time afforded some relief. About eleven years since, the frequency and difficulty increased to that degree, that he was sometimes twenty minutes passing a

single spoonful. Frequently also during the night, and even through the day, the urine passed involuntarily. It was always voided in a small stream, and often with excessive difficulty, for which he now requested assistance.

I passed several bougies of elastic gum down to the stricture, the seat of which was the membranous part of the urethra, but could not get beyond the contraction. Bougies were passed twice a week.

Oct. 6. I applied the kali purum, and directed twelve grains of the compound powder of ipecacuanha, to be taken at night.

Oct. 13. An elastic bougie of very fair size was now passed very easily through the stricture into the bladder. Subsequently, however, the contraction partially returned, notwithstanding the repeated introduction of bougies.

Dec. 1. The kali purum was a second time applied.

Dec. 11. I was enabled to pass a plain bougie, nearly the size of a writing quill, without pain, through the stricture into the bladder. According to his own opinion, the caustic had produced far more benefit than had ever been derived from the plain bougie, by rendering the stream of urine much larger, and the intervals of passing it much longer. Soon after its application on *Dec. 1.*, the stream was nearly as large as a goose quill, and only a week before little thicker than a knitting-needle; the interval since had been six hours, before sometimes a quarter of an hour only; formerly the water passed in a divided, now in a united and single stream.

Dec. 15. I passed a full-sized bougie into the bladder, with so much ease and freedom, that the man, from that and other circumstances, perfectly satisfied his complaints were now cured, discontinued his attendance.

Dec. 28. 1822. This man had experienced no return of his complaints.

CASE 79.

Retention, from Permanent Stricture.

AN officer of marines, aged 34, came up to town May 10. 1822, on account of stricture. He told me that in 1813, from retaining his urine too long, he suffered great pain, and lost the power of passing it. By the next morning the spasm had subsided. Soon after ordered to America, he felt uneasy, and applied to his surgeon. A small bougie was passed, and he was told he had a stricture, although the only inconvenience was a constant gleet. He was soon after this put in orders for the Cape of Good Hope, and told by the surgeon his complaint was debility only, was desired to use the cold bath, which, however, induced spasm at the neck of the bladder, with pain, frequency and difficulty in passing water. For these symptoms he took steel with some relief. On the passage to the Cape he had an unusual symptom; a periodical spasm every second morning regularly; on getting out of bed it came on, with frequent desire, pain, distress, and want of power to void his urine, usually continuing three or four hours, then going quietly off. Small bougies occasionally introduced never passed the stricture, and consequently did no good.

In 1816, returned to England, in improved health. He applied to a surgeon in London who passed a bougie the size of a crow quill into the bladder, and ordered him to be cupped on the loins. On his return to Chatham he was placed under the care of his own surgeon, Dr. DOBSON, who very judiciously begun with small, going on progressively to the use of larger-sized bougies, till he came to those of very fair diameter. Thus was he doing well, when under orders for St. Helena, he was so unfortunate as to contract gonorrhoea, which assailed him with great violence. In three weeks, however, by emollient drinks, and lax

bowels, the symptoms abated. He was then seen by the physician of a large naval hospital, who passed a small sound into the bladder, and directed him a saturnine injection, which upon trial he found produce so much increase of pain, that he laid it aside. Going on board the *Conqueror*, he sailed for St. Helena, where he remained two years, exposed to great fatigue, and a very hot climate; during this period the discharge, which continued, was always aggravated by any excess in exercise.

In 1818, returning home, he was again sounded, and an examination made by the rectum, he was told the prostate gland was very much enlarged; and was directed to take medicines, containing the carbonate of potash, and to drink freely and frequently of barley water. These medicines were soon laid aside, and he then took the blue pill regularly for several months. The kali purum was once applied to a stricture at four inches; after which, a small sound went on into the bladder. Upon this occasion the prostate was reported to be much reduced in size. A few days after the first application, the caustic bougie was again introduced, and pressed rather forcibly, passed the first stricture, and was pushed so promptly up to the neck of the bladder, that although it was immediately withdrawn, pain and hæmorrhage was the consequence; the same night he had a most violent fit of shivering. As he passed his water very freely, complaining only of the continued gleet, he declined further assistance, and remained comparatively well.

In *June* 1821, an attack of intermittent fever, which obliging him to take a quantity of bark, was followed by a swelling in the perineum; but he still made water tolerably well. The local heat and inflammation was decided, and leeches as well as fomentations were frequently applied. The pain in voiding his urine now became extreme

agony, which he believed arose from the water, at those times, passing into the perineum. His surgeon would have laid open the tumor, but a second opinion being against it, the operation was not performed. At length he thought one of the leech bites ulcerated; for in passing his urine, feeling something run down, he concluded his servant held the vessel awkwardly, but was assured all was right. The next time he voided water, the same thing occurred, and he felt such relief and ease, that he laughed with joy; his servant now saw it spinning out like a thread from the perineum. From this time he improved, and soon became very comfortable. During the spring of 1822, the fistulous opening in the perineum closed, and the urine continued to pass in a very good stream, up to the time of his visiting me, the object of which visit was to determine whether he had better pass bougies or not. I tried in vain to introduce curved elastic bougies; they stopped at five inches and a half, and without force would not go further. Examined by the rectum, the prostate gland was found rather more full than common, but apparently healthy, the bowel and bladder feeling perfectly natural. An opiate was directed, and two days after a second attempt to pass bougies failed.

Upon consideration, and particularly seeing him a few minutes after the instruments had been tried, void with ease near a pint of healthy urine, in a very good stream, I concluded that some false passage existed; and told him that under all the circumstances of the case, especially considering the steady freedom in passing his water, I thought it much better to postpone at least the use of any instruments. With this opinion he left town. He was directed some medicines, for the improvement of his general health; from which medicines, he subsequently acquainted me by letter, he had derived benefit.

CASE 80.

Retention of Urine, from Permanent Stricture ; produced by injecting for Gonorrhœa.

A MAN, aged 32, contracted gonorrhœa in 1806, for which he was ordered an astringent injection, and the pil. hydrarg. He threw up the injection as directed, and immediately felt great uneasiness at the neck of the bladder, with frequency of desire to pass water. In a few hours repeating the injection, the irritation became so extreme as to prevent his remaining five minutes together in bed through the whole night. The straining incessant, and the whole canal so loaded, that he voided little water, but more blood.

The next day he was told what he had felt was of no consequence ; he had only to dilute the injection with water, and go on. He therefore continued, and in two months, the heat and other symptoms, with the exception of the frequency in passing water and the discharge, had subsided. The pills he took for three months, for part of which time his mouth was affected.

After laying aside his remedies, the discharge continued about eight months, when he first perceived a lessening in the stream of urine. For this a bougie was several times passed ; and he felt somewhat relieved.

Oct. 1814. He had a bougie passed every day. The parts, however, being irritable, a swelling appeared in the perineum. Its increase slow, and pain trifling, he did not mention it till it had existed two months ; when, from its becoming extremely hot and painful, the bougie was laid aside, and he was ordered to rub some mercurial ointment upon it every night. This treatment was continued a month, when his mouth became sore ; and retention of urine suddenly came on. He was now directed the warm bath, with leeches, fomentations,

and an opiate glyster. The following evening a small elastic catheter introduced, the water was drawn off.

In a few weeks the tumor had decreased, and his health improved. In two months he was well enough to leave home, and return to work; the stream of urine larger, but some remaining swelling in the perineum.

March 1815. Finding the tumor again increasing in the perineum, he came to London for advice, and was admitted into the Infirmary. The inflammation was not only acute, but there was increased difficulty and pain in getting rid of his water. Poultices and fomentations had not in eight weeks brought it materially forward. They were therefore laid aside; by cold applications with leeches, he became easier.

After several unsuccessful attempts to introduce bougies and catheters, I succeeded, *June 6th*, in getting a small silver catheter nearly through the obstructions, but could by no means reach the cavity of the bladder. This circumstance added to what I had observed in other examinations, confirmed the opinion repeatedly given him, that some false passage certainly existed, by which the point of the instrument was caught, and prevented passing the right way. Fortunately the operation was not one essential to his safety, as he was perfectly able to get rid of his water, although not without occasional difficulty.

Soon after this he left the house, and went into an hospital. The surgeon who there attended him, subsequently acquainted me he believed there were false passages; for that in the course of three months he had made no progress with bougies; that now and then an instrument had been got into the bladder, but that the attempts most frequently failed; and that the tumor in perineo had suppurated, leaving a fistulous opening, through which urine passed.

CASE 81.

Retention, from Permanent Stricture.

IN *April* 1819, a man, aged 41, requested my assistance, on account of difficulty in passing his water. He said he had contracted a gonorrhœa, in 1796, with the usual symptoms; he passed his water every half hour. During the continuance of inflammation, he was directed to use a saturnine injection, which only produced intense pain. After three weeks' fruitless perseverance the injection was laid aside, and little else done. Occasionally exposed to the chance, he knew not whether he contracted any new infection, but the symptoms continued eighteen months, when an accident gave a new turn to his complaints. He experienced a sudden and severe pain in the line of the corpus spongiosum urethra, during the turgescence of the parts (in coitu). Considerable bleeding from the urethra followed, and continued most of the night. This led him to believe that something in that part (about two inches and a half along the canal) had given way, because the penis when turgid was previously always drawn downwards, but had now lost this incurvation. The next morning he could not void his urine; by medicines, however, he was just enabled with straining, to get rid of it. Three weeks after, in much pain, he attempted to pass a polished iron wire, which he succeeded in introducing through the obstructed part; on withdrawing it, the urine followed in a stream. He now was enabled to pass a very small bougie, but the irritation and discharge still continued.

In 1799, a surgeon passed a bougie, which stopped at the old spot, the seat of the accident; the lunar caustic was also several times applied, without effect; it was therefore laid aside, and he contented himself with occasionally passing a small bougie.

In 1807, he applied to a well-known empiric,

who amused him by various expedients and experiments, some extremely painful; in six months under his care he drained his pecuniary resources, but passed no instrument into his bladder. He now again succeeded in passing a very small bougie of his own, but violent inflammation in one of his testicles obliged him to see a surgeon, from whom he obtained relief, but on a relapse he went into an hospital. Every fourth day for six weeks caustic was now applied, and a small bougie as often as he made water. At the end of this period the house surgeon, in endeavouring to pass a larger bougie, broke through the urethra into the scrotum; this he felt so distinctly at the time, that to avoid a recurrence of the accident he left the hospital the same evening. An hour after the bougie had been introduced he tried, but could not void his urine forward, but felt it pass into the scrotum, his bladder being relieved. On leaving the hospital he went about nearly three weeks with the scrotum swelled and very painful; although by the assistance of a small bougie he was enabled to void occasionally a little urine forward.

He then applied to a surgeon, who passed some catgut bougies for him. About a month after leaving the hospital that part of the scrotum into which it appeared to him the bougie had been pushed, felt as if gathering. Upon this he went into an infirmary, where the tumor was fomented; and in a few days an opening was made, and much blood and offensive matter let out. A poultice was applied, and an opiate given, he slept well, and on waking passed some water, which flowed entirely through the wound. He occasionally passed a catgut bougie, often had difficulty in reaching the bladder, but could feel when the instrument was going wrong, and by persevering generally found the right way. In two months the external wound healed, and the water passed entirely by the urethra.

There was no return of retention for a year and a half, when from neglecting to pass bougies the difficulty increased, and in straining violently the water, instead of passing forward, burst through into the rectum, upon which he felt the bladder instantly relieved, the urine escaping by the anus. He had at this time no frequency in passing the water, but again had recourse to bougies; an abscess that formed in the perineum, to which he applied leeches, broke into the urethra, discharging freely by the penis.

The water after passing seven weeks by the rectum came again through the urethra, and the opening into the bowel closed; but in voiding his urine some always seemed to remain behind, exciting a burning heat in the seat of the abscess. This uneasiness sometimes continued an hour, but in exercise it soon drained off by the urethra, and he then became easy.

From this time his strictures remained very manageable, till he applied to me in 1819. The first and closest stricture I found at two inches and a half from the orifice. This by a few weeks' perseverance in the use of the elastic gum bougie was considerably dilated, when the second was found at six inches, which, however, did not long prevent a middling-sized bougie passing into the bladder. He so well understood the manner of passing a bougie, that cautioning him occasionally to introduce an instrument carefully, he discontinued calling on me.

CASE 82.

Retention, from Permanent Stricture.

Jan. 11. 1820. A man, aged 43, requested my assistance for stricture in the urethra. He had first suffered temporary retention six years before, from great fatigue. It appeared on enquiry that fifteen years back he had used injections for gonorrhœa, during the inflammatory stage. For the last

few years the stream of urine had diminished, with uneasiness, pain, and difficulty in voiding it, and occasionally with a purulent discharge from the urethra. Passing small bougies gave some relief; but inflammation coming on in the perineum, bougies were laid aside; the irritable urethra again contracted, and the urine now passed with more difficulty than ever.

On his first application to me, his complaints were much relieved by aperient and anodyne medicines, and he could not at this time be persuaded to allow the passing of a bougie.

July 16. The smallest-sized bougie of elastic gum was introduced, and stopped at five inches; it was for a few minutes allowed to remain, and then removed; after which he thought he passed his urine more freely. Bougies, at short intervals, were repeatedly passed till *Oct. 7.*, when, as a contraction one inch and a half from the orifice prevented a larger instrument being used, the kali purum was applied to the first stricture, for the space of a minute, exciting a sense of heat, but producing very little pain. An anodyne was directed for the evening.

Oct. 13. The stream of urine materially improved; I now passed, with some little check at each point, a bougie three sizes larger than the former, through the first and second strictures, into the bladder. The tendency of this operation, however, was rather temporarily to increase than diminish local irritation. This, however, soon went off, and in a week he made water with much more freedom than he had done for many years before. A bougie of moderate size was now introduced once a week for a month, when the irritation and other symptoms having entirely declined, any further attention became unnecessary.

CASE 83.

Retention, from Permanent Stricture.

Sept. 2. 1819. A poor man, aged 34, was recommended to my care, who seven years before had contracted gonorrhœa, for which he took medicines; and in two months, while the discharge continued, he was again connected; upon which occasion some vessel gave way in the urethra, for he soon perceived he was bleeding from the urethra. Obligated to ride thirteen miles the same evening, he found his stockings and boots almost full of blood. When he got home, the evening of the accident, he passed water, and only felt a degree of smarting pain extending two or three inches from the orifice of the canal. The next morning the bleeding had ceased; and by taking medicine all discharge, within the following six weeks, subsided.

He remained well, or had only an occasional sense of pain in passing water, though often exposed to the chance of infection, till 1817, when he thought he had cold, with pains in his limbs, sore throat, and breaking out upon his face. For these complaints he was under treatment from *Sept. to Dec.* About this time he first observed that if he drank rather freely, his water passed from him during sleep; and that whenever he lifted a heavy weight, or otherwise strained himself, it passed involuntarily.

Sept. 1818. Employed in carrying corn into a granary in hot weather, he perspired excessively, and taking cold suddenly lost the power of passing water at all; by rest, a warm bed, and drinking diluent liquids, he was in 24 hours enabled to void a little urine, though with difficulty.

July 1819. While in the country, hard at work, mowing, and drinking stale small-beer, he was seized with severe pain across the back and loins, with urgent desire and total want of power to void his urine. The retention, by rest and care,

again gave way, and in about 24 hours, with perpetual straining, he was enabled to pass a little water. In this attack he also took medicines, which assisted in relieving him. The urine voided in small quantities, was thick and offensive, with whitish-coloured fragments of gravel, that remained about the orifice, gave sharp cutting pain in passing, and felt between the fingers like sand. To these symptoms he had remained more or less subject ever since.

His complaints, when he first applied to me, were of difficulty and frequency in voiding his urine. An elastic bougie the size of a knitting needle was with difficulty made to pass a stricture two inches and a half from the orifice of the urethra.

Sept. 14. 1819. The kali purum was applied; it gave much pain, but no relief.

Sept. 18. The application of the caustic was repeated, and produced less pain.

Sept 20. The water now passed in larger quantities, with more freedom and less frequency than before.

Sept. 28. I was able to pass a middling-sized bougie clear through the first stricture, on to the second, situated in the bulb of the urethra. His complaints were now, however, so much relieved, that he discontinued his calls, and I saw no more of him.

Dec. 26. Finding his old complaints returning, he called upon me. I passed the smallest-sized bougie, which stopped at two inches. Desirous to allay local irritation, I directed him some anodyne medicines, which, however, he repeatedly neglected to take.

Jan. 8. 1820. With increased heat, pain, and difficulty in making water, a considerable hard tumor, painful to the touch, now formed in the line of the urethra, extending forward from the scrotum to the seat of the stricture. Leeches and fomentations gave some relief.

Jan. 14. Leeches again applied with benefit. He was desired to repeat the application of leeches, if necessary, but this he neglected; in consequence of which, in a few days, the swelling again increased, and on its surface appeared a small scale, which partially separating, an opening was the consequence, through which part of the urine flowed.

Feb. 6. I again applied the kali purum, which enabled him very soon to pass nearly the whole of the urine the right way; the fistulous tumor subsiding.

March 8. By continuing the above plan of treatment the stricture near the orifice, always the most troublesome of the two, was much relieved; he passed the whole of his urine the right way, his health so essentially improved, that he felt entirely released from apprehension of a relapse, and left London.

CASE 84.

Retention of Urine, from Permanent Stricture.

A MAN, aged 68, requested me to see him on account of stricture in the urethra, in *July 1818*. He said he had always worked hard, and generally had good health. He said, the first retention of urine occurred thirty years back, from long exposure to rain and wind, while perspiring violently. By rest and medicine it was removed. This kind of attack occasionally returned, but never for any continuance.

In 1816, he generally passed his water every three or four hours, complaining much of heat in the parts. Bougies were introduced, but without much advantage.

In 1818, I passed some bougies for him, and once applied the kali purum; but as his complaints were not at once removed, he had nothing more done.

In 1819, the water rarely passing in a stream,

was more frequently voided, with spasm and straining, by drops. I repeatedly introduced bougies, affording him some alleviation. The urine, generally turbid, deposited either a sediment of white powder, or a very tenacious muco-purulent matter.

Oct. 9. I endeavoured to pass a bougie into the bladder, but could get no further than the membranous part of the urethra. By the compound powder of ipecacuanha, however, he was so much relieved, that he found it unnecessary to continue his visits.

Dec. 26. 1820. The stricture was again troublesome. He voided his urine with increased difficulty, but with less pain in the loins, than formerly. The urine, abundant in quantity, was, from severe straining, tinged with blood. As, however, he declined the use of bougies, I directed him some opiate medicines, by which he was relieved.

May 2. 1822. He was under medical treatment for a typhus fever. The secretion from the kidneys was now very scanty, the urine being generally loaded with a yellowish purulent matter. The straining and difficulty were still considerable, but he declined the use of those means by which he might probably have been relieved.

May 18. I heard accidentally of his death, which had recently taken place; and fortunately obtained leave to examine the body. The kidneys were sound, but within the cavities of that upon the left side was some appearance of purulent matter, mixed with the urine. Between the mucous membrane lining the infundibula, and the adjacent substance of each kidney, was a thin layer of fat; the first time I had ever seen adipose matter deposited in this situation.

The urethra, laid open, was spacious and free to the membranous part, where it had been contracted, partly from permanent stricture, principally by spasm. The cellular membrane surrounding the canal at this part, condensed and diseased, had

formed an abscess nearly the size of a walnut ; it was full of thick pus, but had not yet burst into the urethra, though probably it very soon would. The prostate gland was sound. A narrow circle upon the internal margin of the prostatal part of the urethra was loaded with small vessels, but the internal surface of the bladder was not in a state of extreme irritability, although its cavity much contracted, its substance was consequently thickened.

Two false passages were found on the anterior surface of the neck of the bladder, a quarter of an inch in extent ; where a small bougie appeared to have passed along behind the mucous membrane lining that part of the bladder.

Within the rectum, surrounding the upper margin of the sphincter, were several soft tumors, from enlarged and varicose veins.

CASE 85.

Retention of Urine, from Permanent Stricture.

August 3. 1816. I examined the body of a man, aged 52, long troubled with stricture in the urethra, first produced (23 years before) by injecting for gonorrhœa. He suffered great distress and difficulty in voiding his urine. He had repeatedly had complete retention, and occasionally the other symptoms usually attendant upon stricture. These complaints were commonly relieved by diaphoretics, opiates, and rest. The urine latterly was purulent, opake, almost gelatinous, and highly offensive. About two years before his death, a surgeon had several times applied the kali purum to the stricture, but with little effect, his complaints continuing to prove an endless source of torment.

On opening the body, I found the bladder enlarged and thickened, the muscular coat being on its internal surface beautifully and extensively fasciculated. The ureters enlarged, and internally very vascular. Between the openings of the ureters a

small pouch had formed, communicating with the bladder.

In the bulb of the urethra was a narrow stricture, almost impervious. The inner membrane at the contracted part was delicately thin, but the corpus spongiosum urethræ surrounding it very dense and compact. Immediately before and below the stricture, was a false passage for a quarter of an inch, into which any instrument introduced must necessarily have slipped, in spite of every endeavour to avoid it. The strictured part of the urethra and the parts immediately surrounding it, exhibited a diffused stain of a dull, greyish-green tinge, perhaps from the repeated applications of the caustic alkali. Towards the external orifice of the urethra, the canal was contracted precisely in the manner described as arising from injecting for gonorrhœa. (613.)

CASE 86.

Retention of Urine, from Permanent Stricture.

June 28. 1821. I examined the body of a poor man, a sailor, aged 57 years, who had about a week before been admitted into the Infirmary; bowed down by many years of unremitting pain, varied affliction, constant irritation, and the excessive use of opium.

He had for many years had stricture in the urethra, and occasionally retention of urine, and had been repeatedly under my care, sometimes relieved by bougies, most frequently by medicines, particularly the compound powder of ipecacuanha.

While in the house, he seldom spoke, his mental powers being so reduced by his habit of chewing opium, that he was scarcely capable of giving a rational answer. The usual symptoms of stricture, however, were still present; frequent straining to pass water, by which he was disturbed five or six times a day, but seldom during the night. The urine much loaded with a thick, yellowish, albumi-

nous matter, during the last week of his life, contained small coagula of blood. The smallest bougie would not pass into the bladder, medicines were therefore directed, though unsuccessfully.

On examination after death, I found the urinary bladder moderately contracted, its outer surface more vascular than common. The prostate gland healthy. The bladder removed and laid open, was found to contain about two ounces of albuminous and purulent urine, with small shreds of lymph; and as it flowed out, towards the bottom were observed several minute coagula of blood; and though the inner membrane of the bladder was not crowded with vessels, it exhibited several small coagula of blood still adhering to the points where the capillary arteries were ruptured.

The state of the bladder by no means explained that of the urine, suggesting the necessity for seeing the kidneys. The ureters, particularly the left, were enlarged, thickened, vascular, dark-coloured, and filled with a fluid similar to that in the bladder. The pelvis and infundibula of the left kidney contained a purulent urine, with shreds of lymph effused, but not yet poured out from the recesses of the kidney. The membrane lining these cavities was scattered with minute clusters of convoluted and varicose vessels, as the consequence of irritation. A section of the cortical part exhibited the red vessels here and there larger and more obvious than they are generally met with.

The stricture seated in the bulb of the urethra, was so closely contracted, that it with difficulty admitted a common-sized bristle. It was firm, and of a cartilaginous texture; its former stage of comparative relaxation was demonstrated by the prostatic part of the urethra still exhibiting numerous depressions, the effect of unsuccessful attempts to pass bougies into the bladder.

CASE 87.

Retention, from Permanent Stricture, with Irritable and Diseased Bladder.

A LABOURING man, for fifteen years previous to his death, had been troubled with stricture in the urethra, brought on at first by virulent gonorrhœa. From that period the medical gentlemen who attended had occasionally been called in, to relieve him from retention of urine. This for the most part was readily accomplished by the introduction of a small-sized common bougie, but latterly the stricture had become so contracted as barely to admit the smallest catgut bougie that could be procured.

On these occasions, the instrument was usually suffered to remain some little time, and upon withdrawing it, the urine generally followed. These attacks were commonly the result of intoxication.

For some time previous to his death, he complained of much pain and difficulty in passing his urine; the attempt was often followed by a few drops of blood, and a purulent discharge. At length the desire to pass water proved a constant source of distress, while the urine was voided guttatim, or in very small quantities.

When visited in his last attack every effort was made to relieve him by the means formerly adopted, but the bougie not succeeding, he was put into the warm bath, in which he voided urine in small quantity, but in great pain, to relieve which opiates were administered.

The following day the urethra gave way, a quantity of urine escaped into the cellular membrane; the perineum sloughed, the urine escaped by the opening, and a very few days afterward he expired.

On examination, the bladder was much thickened, but so little contracted, that it still contained near a pint of urine. Removed and laid open, the inner

surface of the bladder was found much altered from disease. The inner membrane had apparently suffered repeated attacks of violent inflammation. On some points the natural surface of the membrane was still visible, of the brightest scarlet colour, from extreme excitement. On other parts extensive masses of effused coagulable lymph was covered with a reddish-brown coat of adherent calculous matter; a change which had taken place most considerably about the fundus of the bladder, at its neck, and in the commencement of the urethra.

The prostatal and membranous parts of the canal were much enlarged from the pressure of the urine, as far forward as the stricture, which was situated at the bulb of the urethra. The stricture itself was nearly impervious, and of a very compact texture, though of no considerable extent.

Where the cavity of the urethra had suffered inflammation and distention behind the stricture, coagulable lymph had been effused, upon which the particles of red gravel had become adherent through the whole extent of the surface.

The fistulous orifice, where the urethra had burst, was directly behind the strictured part of the canal. The prostate gland, considerably enlarged, had an extensive abscess formed within its substance.

For the opportunity of examining by dissection the above disease, and also for the particulars of the case, I am indebted to the kindness of Dr. HOOPER, in whose valuable collection the parts are preserved.*

CASE 88.

Retention of Urine, and Irritable Bladder, with Fistula; from Permanent Stricture.

A MIDDLE-AGED gentleman had many years laboured under strictures in the urethra, producing abscesses and fistulæ in perineo, with occasional

* PLATE III. Fig. 5.

irritability of bladder; all consequent to injecting for gonorrhœa. In *May* 1813, when he consulted me, the urine principally passed by two fistulous openings in the perineum; and a fresh abscess was forming behind the scrotum. He was obliged to pass his water with extreme pain, every quarter of an hour. For many years, he occasionally passed one of the smallest-sized silver catheters into the bladder, deriving temporary relief by drawing off the water. At the present time, the smallest bougie would not pass further than half an inch down the canal.

Fomentations, poultices, and opiates, were first directed. The abscess in a few days broke, and suppurated freely; and in a week, the irritability was so far relieved, as to admit some attention to the urethra. The stricture near the orifice was so firm, and so irritable, that after repeated trials, the smallest-sized bougie only would pass; and even this never failed to produce extreme pain and irritation in the urethra, bladder, and perineum.

Requested to proceed with decision, I proposed the application of the lunar caustic, and the next day passed an armed bougie, sufficiently large in size, that the same treatment might be carried forward to the more internal parts of the canal, if necessary. The common bougie, pressed against the stricture, excited pain almost intolerable. The armed bougie pressed to the stricture with the same degree of force, gave much less distress. It was retained a minute, and withdrawn. The same application repeated every third day for weeks, made little progress, but the irritation continued to decline. The application of the caustic was, in fact, so much less painful than the common bougie, that my patient told me, if I only considered it right to use the caustic, without previously passing the unarmed bougie, he was sure the pain of the operation would be trifling.

At the end of this period, the stricture gave way,

and the bougie passed on to six inches and a half, where it again stopped. One a size smaller, however, went on with little hesitation, into the bladder. The common bougie was now passed every second day for a month, and succeeded in preserving the relaxed state of the urethra. A much larger proportion of water now flowed off by the urethra, at much longer intervals, and with infinitely less pain. He was therefore recommended to pass a bougie about once in every fortnight, and I took my leave.

January 7. 1816. A bougie of elastic gum was passed, and allowed to remain in when he went to bed. In a few hours he awoke in great uneasiness, and found the bougie had so nearly escaped into the bladder, that with the greatest difficulty he at last succeeded in pressing back the glans penis far enough to enable him to take hold of the end of the instrument in the orifice of the urethra, so as to withdraw it.

A most severe attack of irritation in the bladder was the consequence of this accident. The pain, and frequency in passing water was excessive; and frequently notwithstanding the utmost efforts, he was unable to expel the urine. For a few days the water contained little mucus, although numerous small shreds of coagulable lymph, passing by the urethra, occasionally impeded the flow of urine. By degrees, the quantity of heavy sediment increased, that of the lighter flocculi diminishing. The mucous deposit became of so thick a consistence, that the urine passed with more difficulty than ever.

The quantity of opaque white sediment now increased, and standing for some hours, numerous filaments several inches long, floated up in the urine; these, like the rest of the filamentous appearances, were connected with the general mass of sediment, adherent to the bottom of the vessel. Some of these tenacious filaments formed in the bladder, occasioned incalculable distress and straining, from their obstructing the passage of the urine.

He was directed to take the simplest and least stimulating diet, with only barley water. The compound powder of ipecacuanha, formerly very useful, now failed to relieve; and he continued to be disturbed every five minutes, night and day.

Jan. 10. Sixty or eighty drops of the tincture of opium, were directed to be taken every night at bedtime.

Feb. 13. The laudanum regularly continued, had neither procured sleep, nor alleviated a single symptom. It was laid aside, and instead of it, the carbonic acid in soda water, was directed. He was also allowed to take porter, but not wine. In two days, the symptoms began to abate; in a few days more, the appearance of the deposit in the urine was decidedly altered, and with less tendency to coagulate firmly, and less tenacity, there was more of a purulent appearance. This change alone was essential relief, as in the one state the excreted matter blocked up the passage, in the other it did not.

Feb. 15. Some little bits of a reddish-coloured gravel made their appearance, sometimes giving pain in passing the urethra. Formerly, he had been very subject to gravel, but of late years had seen nothing of the kind.

Feb. 18. He was directed to take ten drops of muriatic acid, in some water, twice a day; in the intervals of drinking the soda water.

Feb. 25. He was in every respect much better. The sediment in the urine was now much diminished, and its appearance that of a transparent weak jelly, rather than an opaque albuminous matter. The gravel having disappeared, the soda water was continued alone, the acid being laid aside.

Feb. 27. Able to sleep at night for two hours together, and in all other respects as well as before the escape of the bougie into the bladder. It was now determined to try the effect of gradual distention, with a view to improve the power of retention.

By an elastic gum catheter, two ounces of warm water were injected into the bladder. It immediately produced much uneasiness and pain in the small of the back, the volume of fluid exceeding what the cavity was accustomed to, excited sharp spasmodic pains in the bladder, and it was considered prudent to allow it to run off in five minutes.

The pain from this experiment soon subsided, but by the next day, the irritability of the parts was so much increased as to have nearly brought back the symptoms to their worst state; so that although by LE DRAN, and some others, the operation has been recommended, I shall in future be slow in proposing it.

Towards the middle of *March*, he again improved, still continuing the soda water; and on the 27th of the following month, he called and acquainted me that he was scarcely ever disturbed more than once in the night, passing his water freely, with little uneasiness, and no gravel. The urine had for many weeks all flowed by the urethra; the fistulous openings in the perineum having perfectly healed he was consequently no longer subject to the distressing inconvenience of his linen being always wet and offensive.

March 1822. Occasionally subject to temporary inconvenience from the stricture, this gentleman's general health was exceedingly good; the whole of the urine continuing to pass, generally with freedom, by the urethra.

CASE 89.

Retention, from Permanent Stricture.

A TALL athletic man, long subject to stricture, was admitted into the Infirmary, *June* 6. 1821. His symptoms were irritation at the neck of the bladder, with constant desire to pass water, and great difficulty in voiding it. On introducing a small elastic bougie, a firm contraction was found at six inches

and a half. He was directed an anodyne night and morning, with a warm bath at noon. These means somewhat relieved the difficulty in passing his urine; but he sunk and died on the third day after his admission.

I removed the contracted bladder, with a very enlarged prostate gland; together with the penis. The consolidation of the cellular membrane surrounding the prostate gland, was extensive and considerable, as if much inflammation had once existed. On cutting into the bladder, the inner surface was excessively high-coloured, apparently from effusion into the cellular texture, behind the mucous membrane; not from vascularity of surface. There was about a table-spoonful of foetid purulent urine in its cavity, with loose shreds of coagulable lymph; and towards the neck of the bladder, and in the prostatal part of the urethra, were numerous filaments of the same substance, adherent to the surface of the canal, behind the stricture. As the smallest probe could not be made to pass through the stricture, the parts were laid open by cutting upon the probe introduced from the bladder; when the contracted portion at the bulb, was found extensively cartilaginous.

The prostate gland, eight times its natural size, was converted into a large abscess, containing cells filled with a foetid greenish pus.

The left spermatic cord was much enlarged, appearing to be ecchymosed. The left testicle also, at first sight, was apparently diseased; but the epididymis only was enlarged, the glandular part of the testicle being sound. The epididymis cut into, was ecchymosed, and had somewhat the appearance of bruised flesh, exhibiting many enlarged and tortuous vessels; some of which, large as crow quills, appeared to be veins. This state of parts had probably been the consequence of some bruise received upon the groin, producing effusion into the cellular texture of the spermatic cord and epi-

didymis, the vessels of which, might previously have been in a varicose state. *

The kidneys, and other abdominal viscera, were sound.

CASE 90.

Retention, from Permanent Stricture.

J. L. aged 71, applied to me on account of stricture in the urethra, in *June* 1816. He stated that fifteen years before, he had for the cure of a violent gonorrhœa used an injection, by which the symptoms were much aggravated; one of the testicles inflamed, formed abscess, and by the usual treatment broke, and in three months healed. In the course of this period, the gonorrhœa left him; the only remaining inconvenience being a frequency in passing water.

Several years after, the stream of urine lessened, and an uneasiness in voiding it increased; till scarcely able to pass it at all, he suddenly lost the power of retention. The urine now dropped away from him night and day, with distressing pain at the loins, constantly over-loaded bladder, and unceasing pain and irritation in the urethra. Anxious for relief, he applied at an hospital; bougies failing, a small catheter was passed, and three pints of urine drawn off. Subsequently, the application of caustic was repeatedly made, first to a stricture at four inches and a half, then to one at five, and lastly to one situated at the bulb of the urethra; this treatment occupying in the whole, the space of nine months, when he again made water freely and slept the night through.

About a year after this, the symptoms having partly returned, he was taken into St. Bartholomew's hospital, where, subjected to the usual routine, medical and surgical, the strictures were again overcome, and in six months he was sent out. He now enjoyed tolerable health for some years; but

* The disease is preserved in Mr. HEAVISIDE'S Museum.

in 1814, suffered so much from his complaints, that he entreated to be relieved, and was again taken into an hospital. Caustic, bougies and sounds were used, but often without being made to pass.

In *October*, a steel sound was passed in with force, to overcome the resistance, which gave way, and the instrument went forward, when to his surprise, the surgeon found the point of the instrument at the left groin, where the assistant, and also the patient himself, felt it directly under the skin. It was immediately withdrawn, and some bleeding from the urethra followed. The next day, he had severe pain at the loins; and in the left testicle, swelling and inflammation. He did not observe blood in his stools, but knew that the urine now got into the bowel, because when he made an effort, it flowed out by the anus, without any escaping by the urethra. The testicle fomented and poulticed for ten weeks, formed an abscess, was opened, and in three months healed. During near five months, the urine continued to pass by the bowel, escaping involuntarily, or passing off with watery stools.

About four months after the accident, instruments were again tried, after using warm baths, and other medical means. A small catheter was with great difficulty got into the bladder, where it was allowed to remain five days. The natural passage again restored, the opening into the bowel healed, and he voided his urine in a small stream by the urethra. His health, however, by degrees gave way; and although well enough to leave the hospital, he was from this time much harassed by increased frequency in passing his water, and violent attacks of shivering, with fever.

During the time he was under my care, I occasionally succeeded in passing a plain bougie, of small size, through the stricture at the bulb; and always to his relief. In *June* 1817, he had for some time complained of a sense of swelling within

the bowel. I examined the rectum, but could feel no defined tumor of the prostate gland; the coats of the intestine, however, next the bladder, felt extensively indurated, diseased, and in parts, apparently in a fungated state. The examination gave him extreme distress. Soothing and anodyne medicines and injections, served to give him comfort and ease. Notwithstanding which, he continued to decline, and in *October* died; exhausted by the continued irritation of disease.

With much difficulty I obtained permission to make a partial examination; and found the bladder contracted and irritable, but not ulcerated. In the bulb of the urethra, was a closely contracted cartilaginous stricture, one-eighth of an inch in breadth, round which the spongy texture of the urethra was obliterated. Just beyond the stricture the surface of the urethra had a fimbriated appearance, as if from small flocculi of effused lymph. Anterior to the stricture, not the least deviation from a healthy state was observed; but beyond it were several false passages of different depths, which had almost separated the urethra from the parts beneath.

The mucous membrane of the rectum was thickened, and extensively affected with irritative, ulcerative action. Several small abscesses in perineo, connected with the false passage through the substance of the prostate gland, and communicating with the bowel, were also found in the indurated and diseased cellular membrane, beneath and behind the bladder.

SECT. XX.

Retention of Urine, within the Prepuce.

649. It was not my intention to mention this among the causes of retention of urine, although aware that in early youth, constriction of the prepuce is a very common occurrence, and at the

same time not unconscious that M. DESAULT held it of sufficient consequence to be so entitled.

650. In one instance, however, I have very lately seen all the very distressing symptoms usually consequent to retention, produced by a stricture in the prepuce; and in this case finding but a confined opening in the prepuce, felt disposed from the clearness of the symptoms, to give credit for the existence of stricture in the urethra; and consequently advised the patient of the necessity for his having the prepuce laid open, as a previous step to the subsequent examination and treatment of whatever obstruction might be afterward found in the urethra. The operation, however, trifling as it appeared, soon cleared up the true nature of the case, and the full importance of what had been done, to our mutual satisfaction.

CASE 91.

Of Retention of Urine, from Phymosis.

A STOUT coach-smith, aged 32, had been from infancy subject to difficulty in passing water, produced, as he believed, by a contraction in the orifice of the prepuce. On examination, Nov. 23. 1822, it was so closely drawn, as with very great difficulty to admit the blunt end of a dressing probe; and when in, there was just the same difficulty in withdrawing it. Sometimes he was prevented voiding any water, but by drops with great straining; at others it passed in a thread stream. The prepuce relaxed, and apparently enlarged by distention, argued the truth of his account. For the last fifteen years he had been subject to red gravel, with fits of pain at the loins, inability to raise himself up when stooping, and the other usually attendant symptoms. I first passed a pointed bistoury into the opening of the prepuce, bringing it out again very near the opening, so as to enable me to enter a director; upon which instrument the bistoury

was conducted, and the division of the prepuce completed. The same evening I was sent for in great haste, the bleeding had continued for ten hours, he had lost a great deal of blood, and was rather faint; with some difficulty I found and secured the artery, which still occasionally threw forth its blood in a jet.

March 1823. He called and stated that the operation had removed the whole of his complaints; having from that day experienced no return whatever of any one symptom.

SECT. XXI.

On the Puncture of the Bladder.

651. WHEN either from stricture or other disease, the bladder is absolutely prevented from evacuating its contents by the urethra, it becomes essential to the life of the patient, that the urine be enabled to escape by some other channel; which must be provided either by nature or art. Where this provision is of the first kind, it is formed by those fistulous openings from the bladder, the nature of which has been already explained; where of the second, it consists in the puncture of the bladder; an operation that has been variously performed, but in all cases with one and the same object, that of relieving the bladder from its load, and preventing its bursting from accumulation of urine.

652. The puncture of the bladder has been proposed to be made in one of three ways, either by passing in a trocar through the abdominal parietes above the pubes, or by introducing the same instrument into the bladder by the perineum, or lastly by puncturing the bladder through the rectum.

653. The operation has been successfully performed in each of these situations, but as the puncture from the rectum is in most cases very convenient, and in my opinion an exceedingly safe operation, I generally have preferred it to either of the

other modes ; although where retention is consequent to disease, with much enlargement of the prostate gland, the puncture is more conveniently made above the pubes, in the manner explained. (Case 62.)

654. In puncturing the bladder from the rectum, the trocar need not be much larger than that employed for hydrocele ; although it must be twice the length, and should have a gentle even curvature. The form of the instrument, with the exception of its curve, should be that of the common trocar, with a triangular point ; for the reasons already given. (57.)

655. As to the position of the patient, it is not exceedingly material ; the operation may be conveniently enough performed, as he lies in bed. The fore-finger, well oiled, is to be first passed up into the rectum, and the degree of fulness of the bladder, as well as the most convenient point above the prostate gland, ascertained. When these circumstances are satisfactorily made out, the trocar pushed nearly, but not quite through the canula, is to be gently introduced through the sphincter of the anus, and passed up until the extremity of the canula corresponding in situation with the point of the finger already in the rectum, is felt to be against the part where the puncture is to take place. The canula being in the least degree retracted, while the stilet is pressed forward, places the instrument at once in a fit state for effecting the puncture ; keeping in view the line of direction tending to the centre of the distended bladder, the trocar is now to be steadily passed forward through the coats of the intestine and bladder, when the stilet being carefully withdrawn, the canula must be retained, and the urine allowed to flow off.

656. As the accidental slipping of the canula out of the orifice in the bladder, has been productive of inconvenience from the premature healing of the wound, and the consequent necessity for repeating

the puncture, it is desirable to have a little plate attached to the external part of the canula, perforated with holes, so as to admit of its being secured to a bandage, passing round the waist and between the thighs. This precaution, however, generally becomes unnecessary after the first week or two, as the opening usually very soon loses its disposition to heal, until the restoration of the natural passage for the urine renders it useless,

EXPLANATION OF THE PLATES.

PLATE I.

Fig 1.

AN unusually large calculus, weighing four drachms and fifty-six grains, removed from the kidney of a nobleman after death. There were four more calculi of a smaller size in the left kidney, and eleven in the right. This calculus has been divided through the middle, in order to exhibit the internal appearance and arrangement of its laminae.

a. a. a. Parts of the external surface of the calculus.

b. b. The cut surface, showing the composition of the stone, which was principally uric acid, although in some parts apparently combined with a certain proportion of the phosphates. From the appearance of the section it is pretty evident that this calculus was originally several distinct parts, which subsequently became united together into one larger mass.

c. c. Parts of the external surface rendered particularly smooth, and somewhat depressed by the occasional friction with the smaller calculi, that were found lying in contact with it in the kidney.

d. A part of the external surface, that was thinly covered with a deposition of the phosphates.

Fig. 2.

The kidney of a child laid open; showing the effect of distention from accumulation of urine, in consequence of a calculus formed in the kidney having become impacted in the orifice of the ureter. (60.)

- a. a. a. a.* The natural cavities or infundibula of the kidney very much enlarged from the continued pressure of the secreted urine, all the cavities communicating internally with the central part, or pelvis of the kidney.
- b. b. b.* The secreting structure of the kidney, rendered so thin by the pressure as to be in some parts almost entirely destroyed.
- c.* The calculus, as it was found closely wedged into the orifice of the ureter.

Fig. 3.

The urinary bladder of a child laid open on its posterior part, to show a calculus found within its cavity; and also to exhibit the appearance of the internal membrane when labouring under the irritation of stone. (Case 5.)

- a. a.* The thickened parietes of the bladder.
- b. b.* The ureters which were considerably enlarged, and purulent upon their internal surface.
- c.* The neck of the bladder, and internal orifice of the urethra.
- d.* The calculus.
- e.* The surface of the mucous membrane lining the cavity of the bladder, exhibiting the appearance of numerous small spots of extravasated blood from the friction of the stone producing abrasion of the capillary arteries distributed upon the membrane. This appearance demonstrates the principle upon which the urine is in these cases so frequently tinged with blood, showing that it arises merely from the mechanical injury to the membrane lining the bladder.

Fig. 4.

Exhibits the section of the calculus seen in the last figure.

- a.* The nucleus of the stone, which consisted of uric acid.

- b. A thin stratum which from its open and loose texture, and light-grey colour was apparently composed of mucous matter and the phosphates only. From the size of the concrete round which this first deposit of the phosphates has taken place, it appears very probable that upon the passage of the uric nucleus from the kidney into the bladder, the secretion of an excess of uric acid had for a time been suspended, a change to be perhaps explained by the escape of the calculus having allowed the irritation within the kidney to subside to a certain degree, although the nature of the subsequent addition proves that this action was very soon reassumed.
- c. The more external parts of the stone composed of the phosphates with variable proportions of mucous matter.

PLATE II.

Fig. 1.

A very large abscess formed within the kidney, the cavity being laid open on its anterior part. (Case 6.)

- a.* The inner margin of the kidney, or that situated towards the spine.
- b.* The upper extremity of the ureter, into the divided end of which a bristle has been inserted.
- c.* The inferior surface of a part of the liver, which from the inflammation of the kidney, had been united by adhesion to its superior extremity.
- d.* The gall bladder.
- e.* The general cavity of the abscess, the immediate parietes of which were covered with flocculent coagulated matter, together with the purulent contents.
- f.* A portion of a bougie, introduced from the opening made at the posterior part of the kidney, by which the contents of the abscess were evacuated.

Fig. 2.

Shows the appearance produced in the bladder by extreme irritation, from sympathy with scirrhus disease in the rectum.*

- a.a.a.a.* The thickened parietes of the contracted bladder, laid open by a transverse section through its fundus.
- b.* The corpora cavernosa, and corpus spongiosum, of the penis.
- c.* The mucous membrane lining the cavity of the bladder, crowded with innumerable vessels, and excessively loaded with blood.
- d.* The neck of the bladder and orifice of the urethra.

* The CASE is detailed in Practical Observations on the Diseases of the Lower Intestines and Anus.

Fig. 3.

Exhibits a very singular and curious instance of a preternatural fold of the inner membrane of the urinary bladder, extending from the orifice of each ureter to the opening into the urethra in the prostate gland, forming a valve on each attempt to void the urine; which at first impeded its free exit, and at length proved fatal, with symptoms not unlike those of stricture. (394.)

- a.* The posterior part of the cavity of the bladder.
- b.* The orifice of the urethra.
- c.* The opening of the right ureter.
- d.* The opening of the left ureter.
- e.* The preternatural fold.

PLATE III.

Fig. 1.

A mulberry calculus that was adherent, weighing five drachms and four grains; extracted from the urinary bladder by lithotomy. (Case 23.)

- a.* That part of the surface of the stone that was found adhering to the coats of the bladder, the boundaries of which adhesion are very well marked upon the calculus itself, by that part having been rendered much darker in colour than the rest of the surface.

Fig. 2.

Exhibits a section of the calculus shown in the first figure.

- a.* The nucleus, or central part of the stone.
b.b.b. The parts immediately surrounding the nucleus, demonstrating that particular stage of its growth at which the mulberry calculus begins to assume the peculiar radiated appearance which constitutes its most striking external character.

Fig. 3.

A section of a very singularly large calculus, apparently composed of the phosphates; voided by the natural efforts, from the urethra of a female. (Case 24.)

- a.* The nucleus of the stone, the texture of which was extremely loose and friable.
b. The subsequently deposited laminae, very uniform, and similar in structure throughout.
c.c. A very large mass of calculous matter deposited upon one side of the original concretion.
d.d. Numerous open spaces that were found in the more solid texture of the calculus.

Fig. 4.

Represents the neck of the bladder and prostatal portion of the urethra laid open on the anterior part; from a gentleman who by the unskilful introduction of bougies had produced two false passages. (556.)

- a.* The bulbous part of the urethra.
- b. b.* The lateral lobes of the prostate gland divided, to show the course of the urethra.
- c.* A part of a bougie inserted into a false passage, the direction of which is seen upon the figure to be obliquely backwards, into the substance of the gland.
- d.* Another portion of a bougie passed through a second false passage that had been produced at the neck of the bladder by the bougie first pressing up the inner membrane into a transverse fold, and subsequently passing through it, making its way out again at some distance beyond.

Fig. 5.

Shows the appearance produced by extreme irritation at the neck of the bladder, with effusion of coagulable lymph, and the adhesion of calculous matter to the newly formed surface. (Case 87.)

- a.* The neck of the bladder and prostatal part of the urethra, covered with a layer of coagulable lymph, and crusted over with particles of uric gravel that had become adherent to its surface.
- b. b. b.* Masses of effused lymph, and calculous matter, similar to the above.
- c.* The remaining part of the natural surface of the membrane lining the cavity of the bladder, which was of the brightest red colour, from high inflammation.
- d.* An opening into an abscess connected with the urethra, and formed within the substance of the prostate gland, the cavity of which abscess was covered with adherent calculous matter.

PLATE IV.

Exhibits a striking example of complicated and extensive disease of the urethra, bladder, and prostate gland, not excepting even the rectum; the whole derived in the first instance from the throwing up an injection, to cure a gonorrhœa. (Case 53.)

- a.* The orifice of the urethra, and the glans penis, upon the surface of which may be observed the depressed cicatrices of the chancres.
- b.* The commencement of the stricture that was the immediate consequence of inflammation of the urethra.
- c.* The termination of this contracted part, the extent of which is about two inches and a half.
- d.* A very fine silver probe with difficulty passed through a firm and closely contracted stricture at the bulb of the urethra, and making its appearance behind the stricture through the divided parts, at
- e.* Where the canal might have been brought more into view but for this objection, that the whole of the disease could not in any way be distinctly seen at once, and consequently the other appearances preserved upon the figure would have been partially sacrificed by any further prosecution of the dissection.
- f.* The urinary bladder; its parietes excessively thickened from habitual labour, and its cavity rendered smaller in the same proportion.
- g.* The orifice of one of the fistulous canals, many of which were found passing from the urethra in various directions.
- h.* The double opening from two fistulous passages running into the body of the left corpus cavernosum penis.
- i. i.* The cavity of an extensive abscess formed in consequence of irritation and disease in the prostate gland.
- k. k.* Small rounded calculi with highly polished surfaces, many of which were in this case found deposited in little recesses or cells, around the cavity of the large abscess in the prostate gland.

- l.* A small abscess that was accidentally cut into at the fundus of the bladder, between the external laminæ of its muscular coat.
- m.* A part of the anterior surface of the intestine rectum, closely adherent to the diseased prostate gland.
- n.* A common probe introduced by an ulcerated opening in the coats of the intestine, through the abscess in the prostate gland, thence passing out from the divided part of the urethra, at
- o.* Where the point of the probe makes its appearance immediately behind the stricture.

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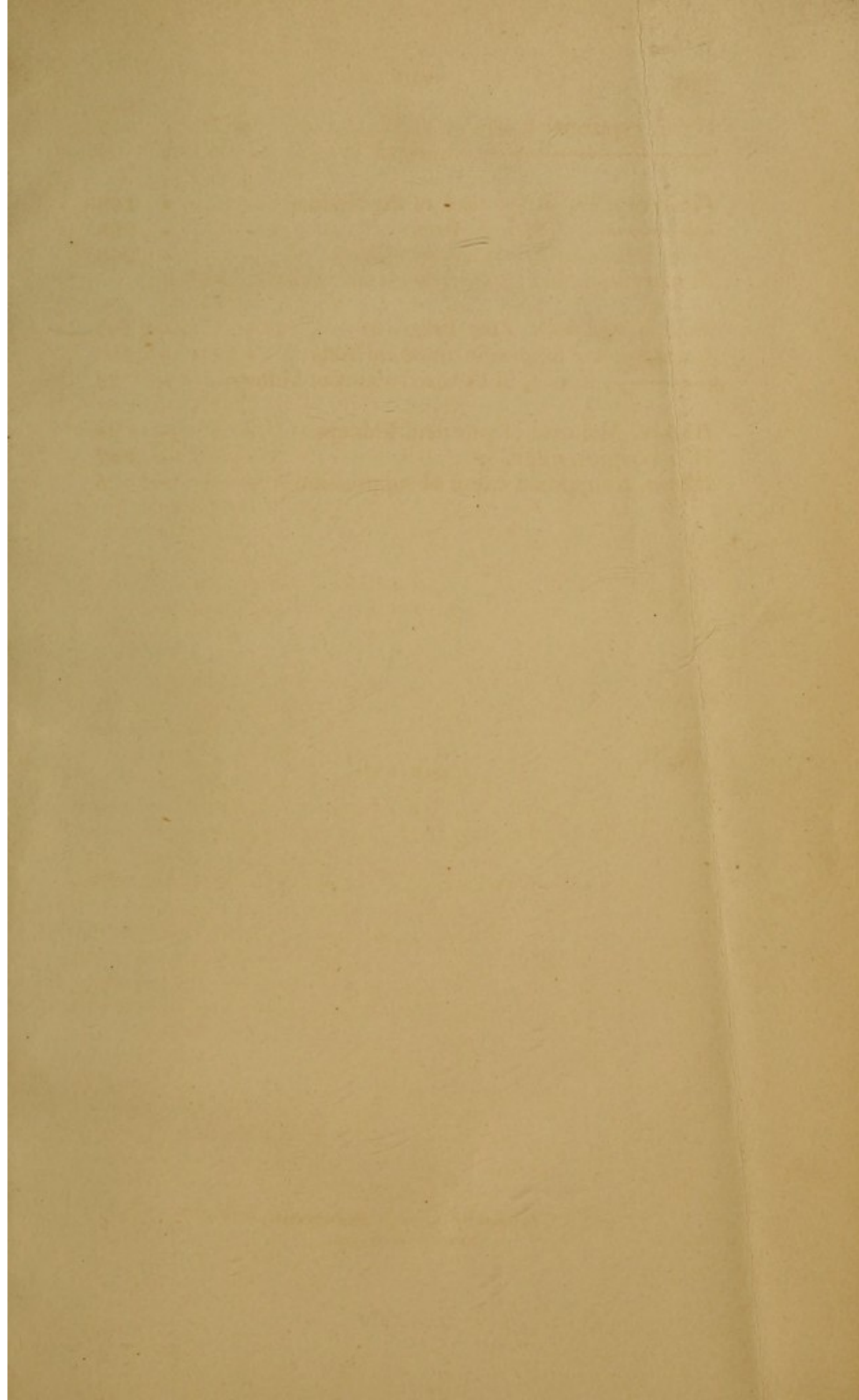
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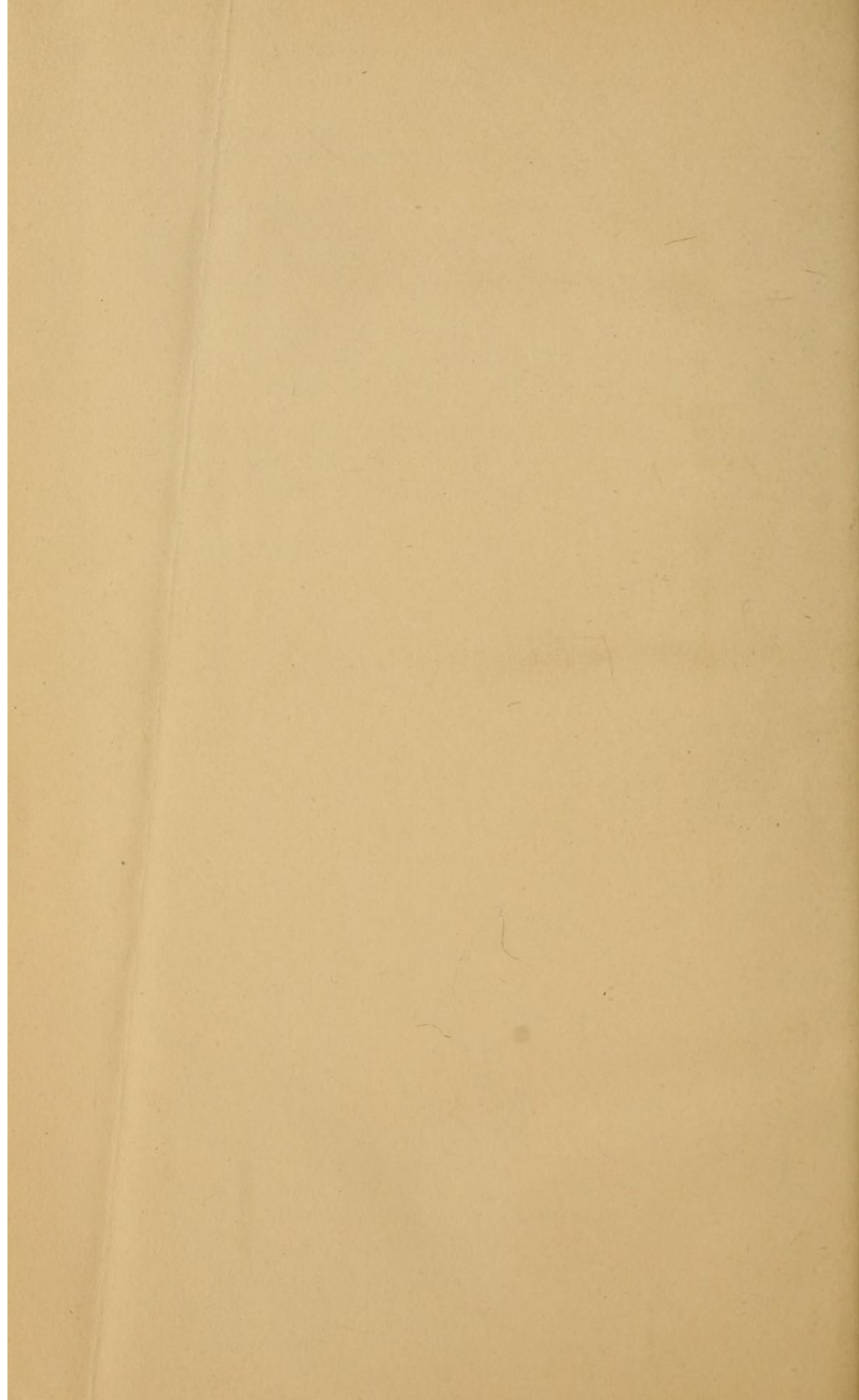
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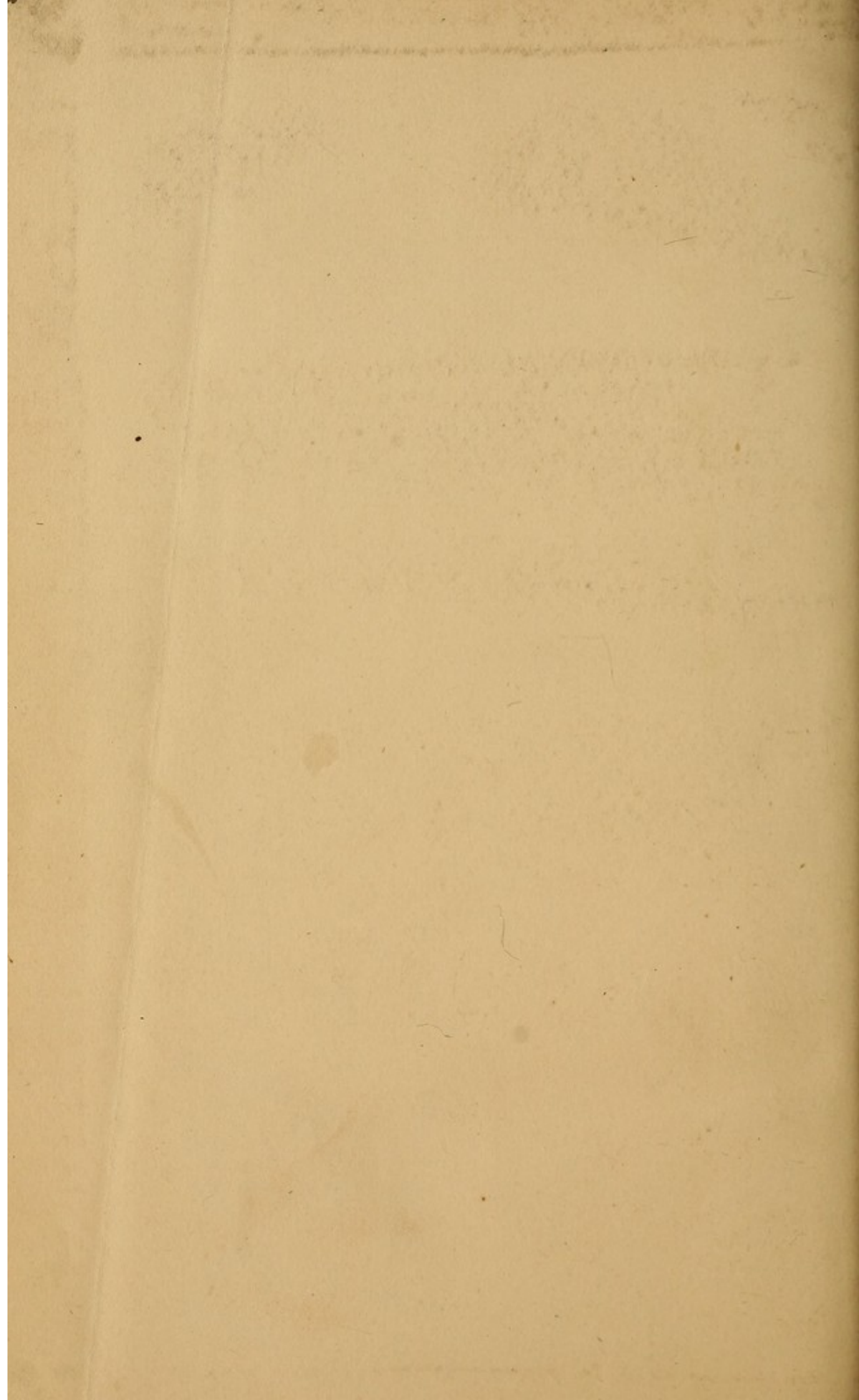
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