

**On the functional diseases of the renal, urinary, and reproductive organs :
with a general review of urinary pathology / by D. Campbell Black.**

Contributors

Black, D. Campbell 1841-1898.

Publication/Creation

London : J. & A. Churchill, 1872.

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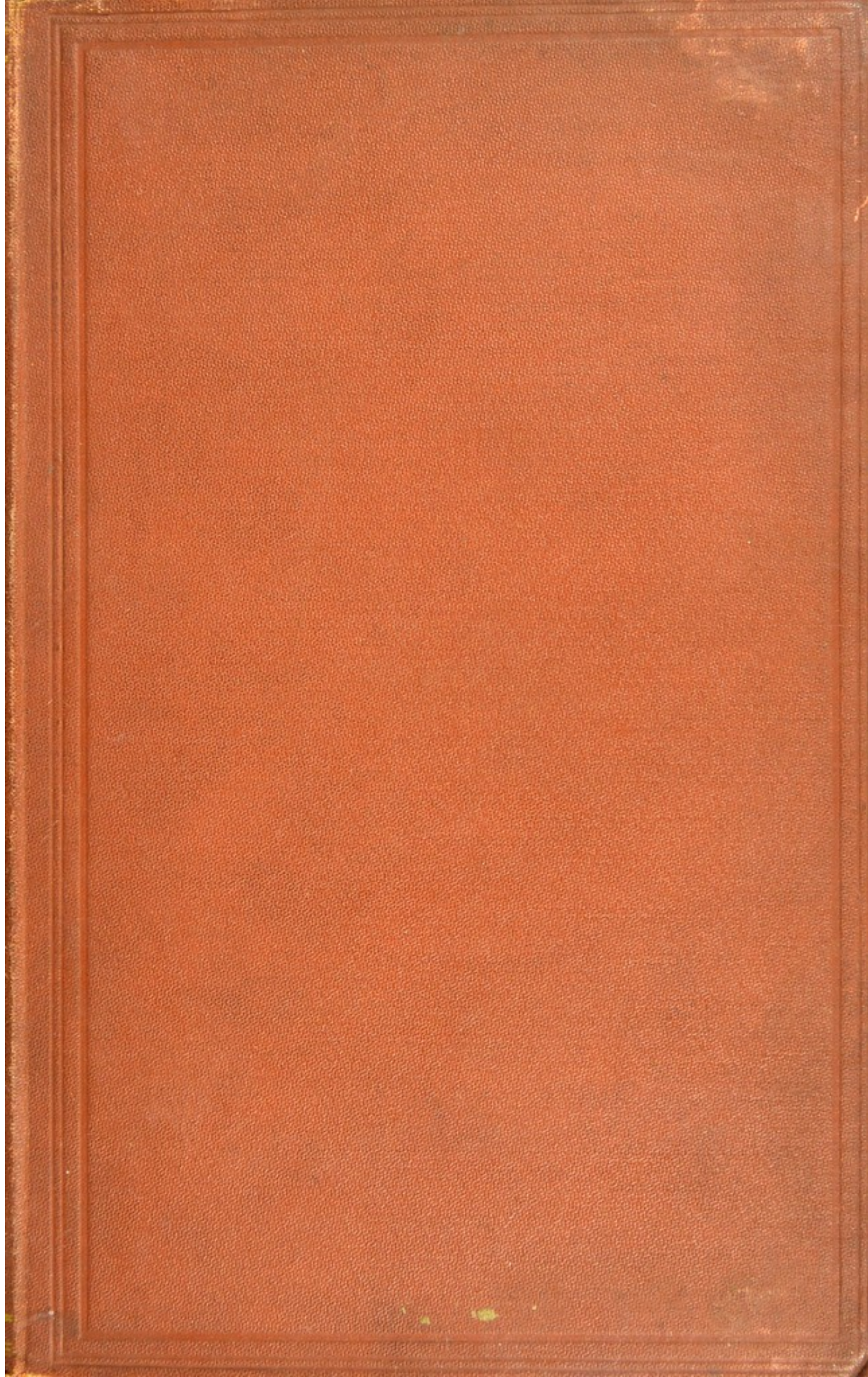
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ON THE
FUNCTIONAL DISEASES
OF THE
RENAL, URINARY, AND REPRODUCTIVE
ORGANS

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ON THE
FUNCTIONAL DISEASES
OF THE
RENAL, URINARY, AND REPRODUCTIVE
ORGANS,

WITH A
GENERAL REVIEW OF URINARY PATHOLOGY

BY

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ON THERAPEUTICS AND DISEASE,' 'ON CERTAIN POINTS IN THE PATHOLOGY AND TREATMENT
OF GONORRHEA,' 'ON SYPHILITIC AND PHAGEDÆNIC ULCERATION,' ETC. ETC.



LONDON:
J. & A. CHURCHILL, NEW BURLINGTON STREET.

1872.

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PREFACE.

We live in a world which is full of misery and ignorance, and the plain duty of each and all of us, is to try and make the little corner he can influence, somewhat less miserable, and somewhat less ignorant, than it was before he entered it.—HUXLEY.

Licet omnibus, licet etiam mihi, dignitatem Artis Medicinæ tueri ; potestas modo veniendi in publicum sit, dicendi periculum non recuso.—CICERO.

It was my primary intention, on applying myself to the task embodied in the following pages, merely to have supplemented a paper by Dr Bradbury of Cambridge, which appeared in "The British Medical Journal" during the past year.

As I reflected on the literature of the subjects treated of, and brought to bear upon it the result of not a little attention on my own part, my undertaking assumed proportions which placed it beyond the limits of medical journalism, and thus necessitated its appearance, if at all, in this form. Besides, the subject of "nocturnal enuresis," and, as it has been euphemistically called, "an allied affection" (the subject of Dr Bradbury's paper), appeared to me to present, both

pathologically and physiologically, such close analogies to the other affections of the genito-urinary organs, that their relative interdependence and importance would be better exhibited by being considered in conjunction with the other functional disorders, an undertaking which I have consequently hazarded, more especially in the light of the opinions I have enunciated in my pamphlet "On Therapeutics and Disease," and elsewhere.

That several of the views there expressed have been corroborated by independent testimony, both abroad and in this country, attaches to them a significance to which they would not be otherwise entitled.

In the first place, in "The Lancet" for 1866, in two papers which that journal did me the honour to publish, I indicated that in a certain class of diseases—the septicæmiæ—the unhealthy suppuration pathognomonic of the variety so included, arose from a contaminated condition of the blood, and that the local expression of these affections, that of the throat in scarlatina, the intestinal inflammation in typhoid fever, &c., represented an eliminating effort by the system, *i.e.*, a specific inflammation due to the presence of an adventitious compound, in conjunction, or in chemical combination with the natural excreta, and being discharged by the same channels. I drew attention to the difference between unhealthy or specific, and non-specific suppuration, maintaining that in the former, as in the throat affection of scarlet fever, the intractability of

the process was due to the auto-inoculability of the pus, illustrating this thesis by what obtains in the case of syphilis and phagedænic ulcerations generally. Further, I expressed the opinion, that poisons so operating were intermediate compounds, the result of perverted chemical changes within the body, and that they occasioned retrograde processes which destroyed the normal vitality of the blood, as manifested in persistent suppuration; and that emanations therefrom—a primary cause either of external production, or originating in the body, being operative—were capable of acting on healthy suppurating surfaces, and of reproducing the parent maladies, as in the cases of hospital gangrene, pyæmia, erysipelas, &c. These opinions have been confirmed by the discovery, in 1868, of a peculiar crystalline substance in certain forms of pus, by MM. Bergmann and Schmiedeberg, which they termed “sepsin;” and Dr S. Samuel, of Königsberg, has performed experiments which confirm the foregoing views. The poison thus formed is probably some combination of sulphur and ammonia.

I deduced from these views the practical lesson, that in such cases there was presented a manifest and rational indication for the employment of oxidising agents, in order to reduce such compounds, by oxidation, to their ultimate and innocuous forms; and just very lately, the same view has been expressed by Dr Day, of Geelong, with reference to the arrest of small-pox by the application of peroxide of hydrogen to the pustules;

and Dr Day's reasons for so doing are those which I advanced in 1866. In like manner I anticipated Dr Basham,* in his explanation of the conversion of uric acid in the system, into urea, by the administration of alkalies and *vegetable acids*, and showed how the therapeutical properties of these agents in cases of gout, rheumatism, oxaluria, &c., were ascribable, not to their formation of a neutral salt with the acid, but to its formation being prevented, by being thus oxidised into normal excreta. As I showed in my pamphlet, this view reconciled various apparent anomalies. The subject is further enforced in its bearing on urinary pathology in the sequel.

There is yet, as already indicated, a subject treated of, of such a nature, or one that has been *made of such a nature*, that a regard for one's own respectability, renders it almost incumbent to plead reasons for referring to it. I hold the mission of the physician in too sacred a light, to consider that any ailment of the human body should be beyond his solicitude, and I believe that the weaknesses of our state are too general, that any one should be visited with neglect or contempt, because, forsooth, he may possibly labour even under a self-induced infirmity. It is gratifying, therefore, to find physicians of position manifesting the courage—for it can be called by no other name—of referring to the functional diseases of the *male* reproductive organs, for hitherto, to too great an

* *Vide* "Practitioner" for 1870, and author's letter on this subject.

extent, a false and highly mischievous delicacy, to me inexplicable, prevented their discussion in any beneficial way. Absolutely *there is*, or *there is not*, such a disease as spermatic incontinence, or spermatorrhœa, as it is generally called. If there is, it is ours *to treat it*; if not, it is ours *to expose the fallacy*.

Worse still, this subject has been long made the basis of a heartless system of indiscriminate swindling as well, on the part—*mirabile dictu*—of some within the pale, as of others, confessedly the greater number, beyond the pale of either legal or academical recognition.

That subject I have treated according to the best of my ability, on its merits, like any other medical question; though, possibly, under the restraint of a sensitive consideration for the delicate susceptibilities of that numerous class of nice people with nasty ideas.

We have all been young—lived in Arcadia—and not a few of us, I venture to assert, must be personally cognisant of the extent to which the foulest and most diabolical conceivable literature is circulated among youth, envenoming and corrupting as it does the natural joys, alas! of too quickly fleeting years. That admitted, as it must be—the unbridled riot of an organised imposture, which, under the cloak of medical science, has spread its cancerous ramifications concomitant with our language, our missionaries, and our

immorality—to whom are the public to look for instruction, and by what means can the last stronghold of charlatanism be razed? It is not to our “free press,” the vaunted palladium of our rights and liberties, for the slimy trail of the inexorable impostor befouls its degenerate columns; it is not to the Legislature, for filthy lucre purchases its fostering protection of Protean quackeries, and it is thus sublimely indifferent, medically speaking, to the welfare of the subject; it is, therefore, in my opinion, on the medical profession alone that such a task must be imposed, and nothing ought to be spurned by our profession which involves the bodily or mental welfare of those of whom, in these respects we ought to be, if we are not, the honest supervisors.

I have long, and strongly entertained these convictions. I have frequently thought with Pott, “that he who thinks he can produce any benefit to society, needs not be anxious about any apology for the publication of his opinions,” but I have been as frequently repressed in a desire to speak out, by deterring influences too operative, I fear, upon honourable men in the profession; and yearning for the initiation of a crusade against this pseudo-medical imposture, I addressed a letter to “The Lancet” some time ago, which will be found in the Appendix.

This letter called forth a few excellent leading articles in this journal, but in turn, presumably, the very reverse of what I anticipated, one or two separate

publications from qualified medical men, embracing doctrines, in my opinion, of a very questionable description. If I can assist in counteracting the pernicious influences of such productions, not a little of my object shall have been attained. I have long felt with "The Lancet" that, "in our existing surgical literature, we know of no work in which these details are treated by any sufficient authority with adequate care and fulness, and without digression into questions which, however important, are wholly irrelevant in a medical point of view," and, it is my conviction, most licentiously exaggerated.

If conscious, then, of certain evils, possessing in our hands the remedy, and we use it not, we are surely culpable. "The Athenians understand what is good, but the Lacedæmonians practise it."

"Video meliora, proboque ;
Deteriora sequor."

Finally, by anticipation, I would propitiate a certain section of the profession—a class represented in every walk of life—by protesting that I am innocent of the conception, that it is in humanity to arrive at *their* estimate of excellence ; but looking to that Utopian perfection in the unattainable distance, a mind conscious of its own integrity has little to fear from the shafts of human malevolence or envy. Furthermore, *I* have some experience of what it is to step aside from the "οἱ πολλοί" of the profession, obedient to the promptings of conviction, and I am possessed likewise

of a slight suspicion, that my philosophy on the subject is not of an unconsoling nature. "When the master of the horse rides abroad, many dogs in the village bark; but he rides on all the same."

D. C. B.

467 ST VINCENT STREET,
GLASGOW, *May* 1872.

ERRATUM.

Page 64, for "serious" read "series."
„ 286, 287, for "mesemission" read "misemission,"

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ON
THE FUNCTIONAL DISEASES
OF THE
RENAL, URINARY, AND REPRODUCTIVE
ORGANS.

CHAPTER I.

ON THE CONDITIONS THAT AFFECT THE SECRETION OF
URINE, WITH SPECIAL REFERENCE TO SUPPRESSION.

THAT mysterious cell which, by an equally incomprehensible process, becomes developed into the perfection of organisation, may be said, from the moment that it receives its germinal impulse, to *live* by *dying*. Whence the initial force which we term life; how physical similitudes and mental characteristics are transmitted to offspring; and finally, what the ultimate destiny of the component parts, are enigmas from the contemplation of which the most transcendent genius recoils with humiliation, and which will, doubtless, remain for ever beyond the grasp of human intellect. "If no mortal lift the veil, we must seek to be immortal."

Animal life is the resultant of two opposing forces, just as the flame represents the interchange of atmospheric with terrestrial matter. It is, so to speak, presided over by what we term vitality, which, from the property that it imparts to animal textures of resisting successfully for such a duration, the ravages

of chemical laws, preserving intact for so long a time the most delicate structures, and above all, in man, of developing an appreciation of the eternal verities in the exercise of the reasoning faculty, is believed to be something distinct from matter.

Where there is so much to admire, as indicating the most perfect adaptation to particular ends, it is difficult, and it were foolish, if it were possible, to institute relative comparisons of perfection. Yet, on contemplating abstractedly the functions performed by the genito-urinary system, and the delicate mechanism subserving to their accomplishment, wonder and admiration are alike excited; and it does seem surpassingly strange, that our emancipation from a morbid repugnance of referring to the diseases of this system should, even in these days of vaunted progress, still remain practically unaccomplished.

One of the most interesting properties of organised structure is that which might be termed the law of material correlation. In other words, the various parts of the body perform their several functions in physiological correlation with the materials with which it is their purpose to deal. Thus the stomach secretes a fluid capable of reducing like elements to itself, to lower compounds, without being itself affected thereby; the bladder tolerates with impunity the presence of a fluid which acts upon the peritoneum, and even the skin, as a powerful irritant; and the mouth, œsophagus, and stomach receive into them, without injury, fluid at a temperature which would scald the exterior of the body. This elementary correlation may be destroyed, on the one hand, by structural changes in tissues themselves; and on the other, by any departure from the

normal chemical composition of the material presented for secretion, excretion, or lodgment.

As instances of the latter may be cited the enteritis of typhoid fever, the hypercatharsis of cholera, and the throat and kidney affections in scarlet fever. A material poison circulating in the blood is presented for elimination to these glands, and possessing as such an abnormal incompatibility with the structure through which it is being secreted, pathological departures from healthy action are thus induced. On the other hand, inflammatory affections, congestions, &c., from whatever cause produced, may primarily destroy the correlation of the tissues relatively to their secretion.

The reduction of protein compounds, as well as their construction into living tissue, being equally essential to the healthy performance of organic life, certain organs of the body have imposed upon them the property of removing the products of animal combustion, just as other organs have assigned to them the function of conveying new material to compensate for the waste or destruction of tissue. Thus a harmonious equilibrium of these two conditions presupposes healthy organisation.

The principal excretory organs are the lungs, skin, and the kidneys, to which probably might be added the liver. All protein compounds are resolvable into the four elementary bodies—carbon, hydrogen, nitrogen, and oxygen, sometimes in combination with sulphur and phosphorus. These compounds are contradistinguished from fats, in that the latter contain no nitrogen, and more hydrogen than is sufficient to form water with their oxygen; and from amyloids, fats are distinguished, in that the former—such as dextrine, gum, sugar, and starch—do not contain more hydrogen

than suffices to form water with their oxygen. In the body these are combined with certain minerals, whose properties in the system are but imperfectly understood, with the exception possibly of iron, which in the hæmatin of the blood is supposed chiefly to attract the oxygen from the air.

To be perfectly healthy every part of the body must possess two essential conditions, viz., free circulation and perfect absorption. If the former be impeded, congestion, and even death of the part, more or less complete according to the degree of stagnation, may ensue; the latter, and the blood becomes charged with poisonous material, intended for discharge by one or other of the excretory organs. These processes being healthy, an interchange of elements takes place in the capillaries, new material is appropriated from the arteries, and the effete is removed by the veins. In this process, that of *eremacausis*, heat is produced by the oxidation chiefly of fats and amyloids, though protein compounds themselves are capable of developing heat, inasmuch as they are convertible by chemical metamorphosis into amyloids in the body. It is on a proper appreciation of this interchange of elementary structures, as I have elsewhere endeavoured to show,* that scientific medicine can alone rest. If the proper performance of this state constitute health, every disease must be some deviation from it.

The destruction of proteids is carried on uninterruptedly within the body; hence protein compounds must be supplied for the maintenance of life, and consequently neither fats nor amyloids are alone capable of being employed as food.

* Observations on Therapeutics and Disease.

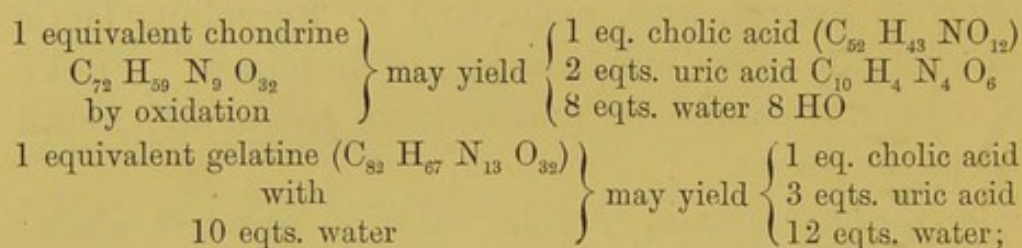
In the process of the reduction of effete and superfluous proteids for removal from the body, the reduction is not carried to a complete separation of the ultimate compounds. Thus the lungs excrete carbonic acid, water, and a trace of ammonia derived, doubtless, from the decomposition of urea; the skin more water than the lungs, less carbonic acid—and urea, as we shall see, only in diseased conditions of the kidney—sebaceous matter, and, according to Berzelius, lactic acid, chloride of sodium, muriate of ammonia. Funke and others, it should be added, have frequently found urea in the sweat.

The kidneys, again, secrete water in greatest abundance, urea, uric acid, sometimes hippuric acid, the phosphatic compounds of soda, lime, and ammonia, the sulphates of potash and soda, chloride of sodium, a little carbonic acid, oxygen and nitrogen gases, mucus and extractive matter, with traces of other salts. Urea forms nearly one-half of the solid constituents of the urine; and, while it is not within the scope of these remarks to examine the disputed question as to where urea is formed, it may be remarked, that in common with all the other excretions, it represents the oxidation, more or less complete, of effete matter, or of superfluous protein matter circulating in the blood.

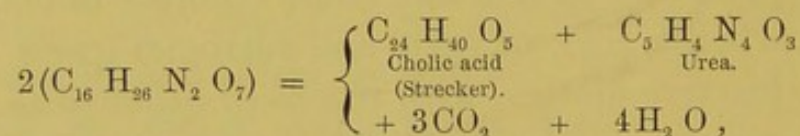
The various excretions are formed in the depths of the tissues, and are simply removed by the emunctories. If the oxidation of the proteids be not sufficiently complete, intermediate compounds are formed, and these constitute the *materies morbi* of certain diseases with which we are familiar, such as gout, rheumatism, neuralgia, &c. While uric acid may be looked

upon as a normal constituent of the urine, it should exist in it, but in small quantity; hence the greater portion of it is in the system raised, so to speak, by oxidation to urea. Accordingly, when respiration is more or less impeded, such intermediate compounds, as oxalic acid, allantoine, &c., are formed.

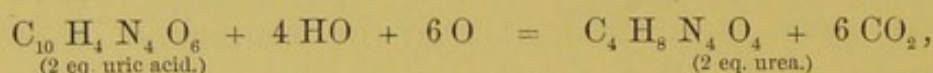
The following equations will exhibit at a glance such interchange of elements as doubtless takes place:—



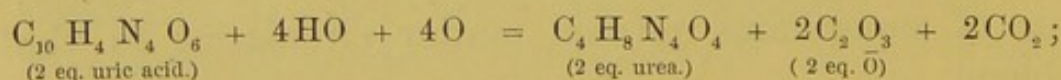
or, according to the new notation, the following equation may represent the change:—



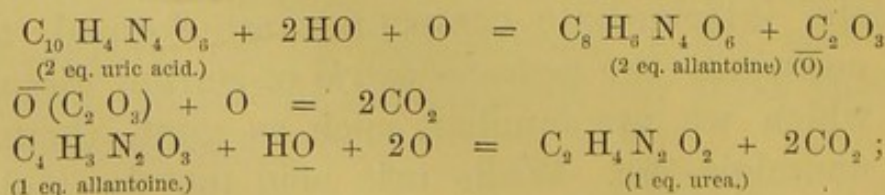
while uric acid is convertible into carbonic acid and urea, as follows:—



or with less oxygen—



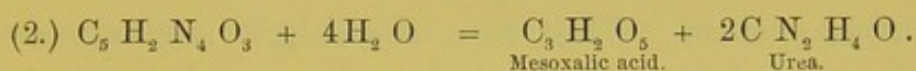
or, with two equivalents of water and one of oxygen, uric acid yields allantoine and oxalic acid, which by further oxidation yield urea and carbonic acid,



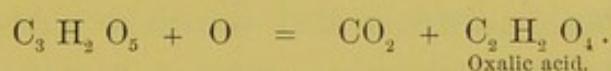
or, by the new notation, the following may be the transformation. In presence of water, uric acid, in being oxidised, gives up two of its hydrogen atoms, and the residue reacts with water to form *mesoxalic acid* and urea; thus—



and



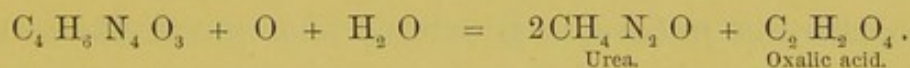
If the oxidising action be energetic, the mesoxalic acid is converted into oxalic acid, thus—



Allantoine is thus formed—



or if the oxidising power be stronger, allantoine is converted into urea and oxalic acid, thus—



In ultimate anatomical structure, the lungs, kidney, and skin are analogous, in that they represent a delicate membrane, on the one side of which a network of minute blood-vessels ramifies, while the other presents a free surface. That there is such a law as I have ventured to term that of material correlation, is indicated by the fact, that if the ureters be tied, or the kidneys extirpated, notwithstanding that the skin and lungs continue actively to perform their functions, death will ensue; and conversely, the same result takes place if the cutaneous exhalation be prevented, despite the active performance of its functions by the kidney.

To this general statement regarding vicarious elimination there can be no exception, if the arrest of the excretion of either organ be sufficiently protracted, though, as we shall see in the sequel, temporary obstruction is not necessarily fatal.

All the secretions of the body, as we shall have occasion frequently to observe in the course of our remarks, are very directly under the influence of the nervous system. That from the skin being augmented by fear, or sometimes entirely suppressed ; while most people must have in their own experience practical illustration of the influence of excitement or anxiety in causing both enuresis and diuresis. According to Zimmerman, fear likewise may occasion diarrhoea, seminal discharges, erysipelas, and eruptions about the lips. Instances are likewise on record in which strong mental emotions have actually been followed by bursting of the heart, and universal paralysis ; and jaundice is familiarly enough ascribed to mental impressions of a loathsome nature. Blushing is a manifestation of the same nature, and it is scarcely necessary to remark how easily this condition is occasioned in very sensitive people. That this state is associated with an impression on the sympathetic nerve, may be proved by experiment on living animals. Thus, if in a rabbit the branch of the sympathetic which is distributed to the head be cut, the minute vessels in the delicate integument of the ear are seen to become distended with blood, and the formerly pale structure to be suffused with a red glow ;—this being due, just as in blushing, to the abstraction of the controlling power of the sympathetic (the fibres of Remak) over the muscular fibres of the minute capillaries. There is thus more

blood sent to the part, and in the case of a gland it will readily be perceived how this condition will influence secretion.*

But, on the other hand, an opposite condition may be established, if the cut end in connection with the vessels in the rabbit's ear be irritated. Then pallor and cold are occasioned, the former due to the fact that there is contraction of the capillaries through their muscular fibres, and, according to its degree, less or no blood at all may be sent to the part; and just in proportion as the supply of blood is diminished, the chemical changes inseparable from its presence are interfered with, and unnatural cold, as a consequence, ensues. These experiments, as we shall subsequently see, have an intimate bearing on the secretion of the renal, as well as on that of all other glands.

Without entering into the minute structure of the kidney—a subject alien to the purport of these observations—it is requisite that it should be noted, that the blood from which the urine is secreted is derived directly from the aorta by means of an artery of considerable size. It is consequently arterial, having almost immediately before traversed the left side of the heart; but in passing through the lungs the venous blood parts with but an exceedingly minute quantity of urea; and even in the aorta, the blood is consequently impure in respect of its containing urea and uric acid. Accordingly, it has been conclusively demonstrated, that the blood leaving the kidney by the renal vein is the

* In the experiments of Eckhardt upon the splanchnic nerves, it was found that section of them induced hyperæmia of the capillaries surrounding the *tubuli contorti*, albuminuria, and increased secretion of urine.

purest in the body, containing less urea and water than even that in the left side of the heart.

The minute branches of the renal artery, entering into the dilatation of the uriniferous tubule, break up into a congeries of looped capillaries, called a glomerulus, nearly filling the dilatation of the tubule, or the Malpighian capsule. From the glomerulus the blood is removed by a small vein, forming an intricate network of capillaries round the tubule. The tubule is possessed of a minute epithelial lining, continuous with that of the pelvis of the kidney, and the other urinary passages. As the tubule is traced into the capsule the lining becomes more delicate, until at length it disappears entirely. The glomerulus is thus in direct communication with the exterior. It will be obvious, then, that the secretion of urine will be influenced by the law of osmosis.* Thus the blood†, in a state of health, has a certain specific gravity (1.055), is loaded with a certain amount of solid matter in addition to its serum, and the urine in health consequently represents a corresponding constancy of composition; but given certain deviations in the blood, from the normal standard, and the secretion of urine and its composition will be naturally influenced.

It may, therefore, be predicated of this important

* In his paper on "Dialysis, or Liquid Diffusion Applied to Analysis," Professor Graham divided bodies into colloids and crystalloids, the former being comparatively fixed as regards diffusion, the latter possessing the very opposite property. It is thus that, in the normal condition of the kidney, the albumen is not diffused along with the urea. According to Graham, albumen, a colloid, is $2\frac{1}{2}$ times less diffusible than gum, another colloid, and 1000 times less so than chloride of sodium, which belongs to the opposite class of crystalloids.

† Every 100 parts of blood contains 79 parts of water, and 21 parts of dry solids. The solids and water stand thus in about the same proportion to one another that the nitrogen and oxygen of the air do.

secretion, that it is regulated—first, by the state of the circulation, and that the circulation may be influenced in various ways by *stimuli*, mental or physical; secondly, that it may be influenced by pressure from within or without; and, thirdly, as we have just observed, by blood impurity; and, lastly, by structural changes in the gland itself, by which the correlation of the uriniferous cells, relatively to the blood, is altered.

Consequently, it may be remarked, pure stimulants act as diuretics by accelerating the circulation through the kidney; alkalies, by facilitating the transformation of tissue into perfect excretions, and thus presenting to the kidney its natural stimulus in more or less abundance. Hence, we know that urea introduced into the blood is speedily excreted by the kidney, causing an increased flow of urine. And, again, certain agents, such as squill—which likewise acts as a cardiac stimulant—iron, and terebinthinate agents act as diuretics, by stimulating the uriniferous cells *in transitu*. The first and third orders do not increase the amount of solid matter relatively to the quantity of water; the second does, for obvious reasons.*

The kidneys are abundantly supplied with nerves derived from the renal plexus and lesser splanchnic nerve, and also with branches from the cerebro-spinal system. By means of its nervous distribution, these organs are intimately associated with the bladder and reproductive organs, and hence there exist in diseased conditions close pathological sympathies.

From the experiment above referred to on the rabbit's ear, it will be at once intelligible that irritation

* See the author's "Observations on Therapeutics and Disease."

of the nerves supplying the kidney will at once arrest the secretion of urine, by diminishing, it would appear, the necessary amount of pressure normally exercised on the Malpighian tufts. As a consequence of this state, the renal blood becomes darkened by the retention of its impurities.

Bearing upon the influence of the nervous system, the interesting fact may be mentioned, viz., that while the cerebro-spinal branches of the nervous system terminate in *acid* fluids, the sympathetic is distributed over surfaces possessing an *alkaline* reaction. And Dr Rees has pointed out the remarkable fact, that the great sympathetic ganglia are strongly alkaline, while the brain and spinal marrow (and more especially the grey matter), if examined immediately after death, are scarcely neutral to test paper, and become rapidly acid on exposure.

In the light of the foregoing facts we proceed to consider the subject of urinary suppression.

Strictly speaking, a functional disease presumes an aberrant action of an organ, unattended with any structural change, at all events, of an appreciable nature. Therefore typical cases of suppression of urine are those in which, in previously healthy people, the excretion of urine is arrested from no obvious cause. These cases are certainly difficult of explanation, while they are so rare that Dr Roberts, of Manchester, in relating a case of what he calls "suppression from mechanical obstruction" (retention?) observes that he is not aware "that there exists on record a detailed account of the symptoms arising in a previously healthy man who has suddenly ceased to secrete urine;" and adds further, "I therefore make no apology for relating

somewhat minutely the following history, which is a picture of simple, uncomplicated anuria, and represents what might be expected to take place if the kidneys were suddenly abstracted without the shock and injury of a cutting operation."

Considering the source, Dr Roberts' unfamiliarity with records of similar cases is not a little surprising, as many cases identical in nature with his own, will be found in several old authors.* Again, I would certainly demur to the application of the term "anuria" to a case of mechanical retention of urine.

As these cases seem rarer than I anticipated (or at least a knowledge of them), the following case of *genuine suppression*, related by Boerhaave, may be referred to. A gentleman, from close attention to business, neglected to pass his urine; at length he lost the power of expelling it, and it was consequently 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 and per-

* Dr Parr relates a case which occurred in his practice, in which no urine was secreted for six weeks; and Haller a similar case which lasted twenty-two weeks. In Dr Parr's case, the only indication of vicarious elimination was a profuse sweat for a day or two. In the "Philosophical Transactions," Dr Richardson made mention of a case of suppression in a youth of seventeen, who had never made water from birth, and more remarkable still, that he never felt any uneasiness, was healthy, vigorous, and active. In this case, however, there was an habitual diarrhoea. *Vide* also case by Sir Henry Alford in the "Medical Transactions."

† These symptoms are not at all unlike those produced in rabbits by the introduction of urea into the blood. Thus, Gallois saw a rabbit, weighing two kilogrammes, killed by twenty grammes of urea; first of all its respiration was retarded, then came on weakness of the limbs, tremblings, twitchings, general convulsions, rigidity, and death.

spiration, quickened pulse, convulsion, lethargy, and death; and it is added, "*In cerebri ventriculis reperta est urina.*" This shows that urea was being formed in the tissues, while the kidney was incapacitated for its removal. This case may be taken as typical of the instances of suppression from pressure from without, above referred to. Why this should so happen it appears not a little difficult to explain. It seems just as if the action of the kidney had been reversed, and that the accumulation of urea took place so quickly as to cause death before the organs had time to recover their function.

In contrasting the symptoms of this case of true suppression with Dr Roberts' case, they are analogous in presenting the feature of insomnia. In this case, also, muscular twitches occurred on the seventh day, and became more severe and frequent as death approached, though, as in Boerhaave's case, they did not amount to actual convulsions. The breathing was laborious, and manifested a tendency to diminution as death approached, and the faculties were clear to the last gasp. "There existed," adds Dr Roberts, "in the last three days a constant tendency to lapse into indifference, and fitful dozing and starting when the patient was undisturbed. The pupils did not show a decided contraction until the ninth day, and the dryness of the mouth and tongue became a marked feature on the same day. The duration of life was a few hours over nine whole days from the date of suppression. This, I believe, will be found to be about the average duration of cases of complete suppression, occurring in previously healthy persons."

The following case is more similar to that of Dr

Roberts', as it was a case of suppression (?) from renal calculi. It is thus related by Howship:—"I opened the body of a healthy-looking man, aged eighty-three, 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 faecal 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 anything resembling pus ; those 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 head of pins, were detected in the substance of the kidney, confined apparently in the tubuli uriniferi.”

This interesting case is referred to somewhat by anticipation, in consequence of its identity with that of Dr Roberts', detailed in “The Lancet,” and is not to be regarded as a case of true suppression, which subject more immediately concerns us at present.

Perhaps the most singular case of suppression recorded is that related by Dr Dawson, in vol. ii. of the “Philosophical Transactions,” and it may therefore be excusable to present a brief outline of it here. The patient was a woman, an inmate of St George's Hospital. In addition to sundry other complaints, permanent suspension of all action in the kidneys came on, and she is said to have had total suppression of urine for 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. Afterwards she often had a suppression of urine ten or fourteen days, and once for two months, during which time she had no vomitings, but her body was very much swelled.*

Suppression of urine may be complete, or incomplete. The former is rare, and almost invariably fatal; the latter not unfrequent, and affording, according to its degree, a better chance of recovery. The one, as in Boerhaave's typical case, is purely functional; the other more frequently ascribable to injuries of the kidney, or to certain abnormal states of the blood.

Suppression is to be distinguished from retention, if the cause of the latter is vesical, by examination of the abdomen, the urgent desire, on the part of the patient, to pass water, and the introduction of the catheter; and negatively by the absence of pain in the region of the bladder, no desire to pass urine, as a rule; and by the existence of deep-seated pain in the loins, and usually tenderness on pressure in this region. Suppression is further characterised by a certain amount of fever, vomiting, the matter vomited having an urinous smell, thirst, an urinous taste in the mouth, and an urinous odour of the breath; while very soon the fatal nature of the malady dispels all doubt.

From retention occasioned by obstruction in any part of the ureter, suppression is distinguished, first, by the history of the case as regards the existence of an antecedent calculous diathesis, the locality of the pain,

* Quoted by Howship.

sympathetic pain in the testicle and groin, and the fact that in almost all these cases, more or less urine finds its way into the bladder; and by the negative indications afforded by the absence of the symptoms of suppression.

The development of the symptoms of suppression may be in certain cases retarded by vicarious elimination. Hence Desault remarks, "Il est vrai que la nature prévient quelque fois les accidens on retarde leur naissance, en se débarrassant en partie des urines, par d'autres émonctories, tel que la peau, les oreilles, les narines, la bouche, les mamelles, l'anus," &c.; and Dr Johnstone* mentions 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 on being gathered, was found to have the taste of crude sal-ammoniac;" and a very rational explanation of this occurrence is offered, that the secretion of urine being prevented, the ammoniacal salts were determined to the skin in such quantity as to crystallise as the sweat evaporated. According to Schottin, in such cases as this urea is found in pus and milk, and the sweat may contain so much of it as to form a crust upon the skin.

More recently, in the "*Deutsch. Arch. f. Klin. Med.*," Dr Deininger published the case of a boy five years of age, who suffered from anurea renalis for a whole week, and on whose skin urea was discovered. Five cases of this kind have been recorded by Jürgensen and Leube; but the issue was fatal in all, whereas Dr Deininger's patient recovered.

These conditions constitute what may therefore be termed idiopathic suppression of urine; in addition to

* *London Med. Commentaries*, vol. v.

which suppression is found to exist as one of the phenomena of other diseases, notably of cholera; and more particularly during the algide stage of this dire malady, whose mysterious selection of locality, as it were in obedience to some law, and whose indiscriminateness of attack, suggest the existence of a specific poison.* What are the manifestations of cholera associated with the condition of suppression? In the stage of collapse there is an impeded, if not absolute stagnation of blood in the capillaries, and consequently pallor of surface and intense coldness, accompanied with a copious purging of the albuminous, alkaline, and saline matters of the blood. Two explanations have been offered for the capillary stagnation: the one—the mechanical—that the blood has become so inspissated by the loss of its fluid constituents, that it cannot be propelled through the vessels; the other—the vital one—the well-known theory of Dr Johnson, that there exists an impediment to the passage of the blood through the minute branches of the pulmonary artery in consequence of spasm of their muscular coat, and that this explains the retrograde engorgement of the systemic venous system, the lividity of face, coldness, &c. With the correctness of this theory we are not concerned. We take the facts, that there are an obstructed, or actual arrest of the circulation in the capillaries, prostration, a copious purging of the saline and albuminous compounds of the blood, along with the interesting fact, that the branches of the sympathetic are distributed over surfaces having an alkaline reaction, and, further, the beneficial effects which un-

* *Vide* Review by the author, of an outbreak of cholera in the United States Army, Glas. Med. Journal, 1867.

doubtedly accrue from the introduction of salines into the veins; and what are the inferences legitimately deducible therefrom? *

Recalling the experiment on the cut portion of the sympathetic in the rabbit's ear, it will be remembered that irritation produced a contraction of the vessels in the ear, and consequently diminished flow of blood, pallor, and coldness; and assuming, as we believe every one must do, the existence of a specific poison in cholera, is the inference not a fair one, that this poison probably acts by irritating the sympathetic, thus causing contraction of the capillaries, arrested circulation, and its inseparable concomitants; again, we have specially seen that irritation of the nerves supplying the kidney arrests the secretion of urine. We are thus furnished with a rational explanation of the condition of suppression; just as the circulation is impeded, urea is not formed—the nitrogenous compounds of the body are not reduced; the albumen which ought normally to supply the place of the effete tissues, remains unchanged, the kidney is not presented with its normal stimulus, and its function being arrested, the salines and proteids circulating in the blood are removed no doubt with the cholera poison, from the intestinal mucous membrane. Hence, it is quite unnecessary to maintain the theory of the vicarious elimination of urea from the bowels, as Sir Thomas Watson had done, but which he has since abandoned, the *fact being that no urea is formed.*†

* Azotised matters seem to increase the coagulability of the blood, and being unappropriated, to such a degree, in cholera, this may to some extent at least, account for its thickened condition.

† Some writers seem to think that if they prove an irritable condition of the gastro-intestinal track, this must necessarily overthrow the view that the algide

Further, if the cerebro-spinal nerves terminate in the acid secretions, and the branches of the sympathetic in the alkaline; there is nothing superfluous or without

stage of cholera is due to defective oxidation. Thus, Mr Sedgwick (*Lancet*, November 11th 1871) cites for this purpose a "case of gastro-enteritis from local irritants, simulating cholera on two occasions in the same individual." "Not only was the collapse identical with that of cholera, but, as in cholera, the suppression of urine was on both occasions followed by temporary albuminuria." This rather corroborates in a remarkable manner the views I have advanced in these pages, and prior to my knowledge of this case. Here we have a tangible cause of the gastro-intestinal irritation. Mr Sedgwick must, consequently, admit that irritation is an effect, and if existing in cases of cholera, though in the absence of an apparent, is it unreasonable to assume the existence of some specific cause here in like manner?

Mr Sedgwick, in attempting to confute Dr Johnson's belief, further uses the following argument, "The fallacy of assuming that the cyanosis in cholera is due to defective oxygenation of the blood, may be illustrated by what has been observed in the case of a warm-blooded animal during hybernation, when its condition, as regards both the circulation and the respiration, is reduced below that of a reptile, and yet the diminished supply of oxygen to the system is found to be accompanied by an increased redness of the blood." Here, again, Mr Sedgwick is in error, and certainly does not seem the proper person to correct "Physiological Errors connected with Cholera." It is true that the venous blood of animals during hybernation, or after section of the spinal cord (Bernard), or during syncope (Hunter), is red, but simply because that, owing to the muscular relaxation, there is diminished consumption of oxygen, and consequently interrupted metamorphosis of tissue, and the absence of its elements in the venous blood. That Magendie demonstrated, that after the injection of water into the veins of a dog the urine becomes albuminous, can in no respect, I apprehend, strengthen Mr Sedgwick's position; it simply shows the relative co-ordination between the albumen in the blood and the secreting structure of the kidney has been temporarily destroyed; the albumen being thus diluted.

Mr Sedgwick may be further reminded of the remarkable lowering of the temperature in cholera to 95° F., and more remarkable rise after death to 103 F., while the muscles give out their characteristic susurrus. Is this rise of temperature not due to chemical changes—an attempt at restoration after the poison has overcome the nervous system?

It is startling, remarks Professor Haughton, on making a post-mortem examination of a cholera patient alone, and by candle light, to witness, on the first free incision of the scalpel, the hand of the corpse rise slowly from its side and placed quietly across its breast.

design in the body, and assuredly there must be design in this. There is, probably, a chemico-vital correlation requisite to the performance of vital function, just as electricity is developed through the immersion of particular plates in acid solutions. May not, therefore, the withdrawal of so much of its alkaline constituents from the blood still further impress the sympathetic, and may not the benefits which result from the injection of alkalies into the veins restore, possibly, its normal stimulus to the sympathetic? Again, the alkalies by their power of oxidation raise the temperature, thus stimulate the capillaries, and restore the function of the blood.* Free oxygen does not exist in the choleraic discharges. As I have elsewhere observed, "It is possible that by these copious evacuations (from the bowels), the *vis medicatrix naturæ* is in operation, but in thus attempting to rid the system of the noxious material, the constitution of the blood is compromised, and the interchange of elements generating heat in the depths of the tissues, and constituting life by the proper performance of this function, is impaired. In a chemical point of view, the alkaline salts constitute the most important principles of the blood, as their presence greatly promotes oxidation; even vegetable acids are converted in the system into carbonates for this purpose. If, then, the alkaline and saline matters are in cholera removed therefrom to any considerable extent, the practice of recruiting the blood through the veins, with such material as that removed by the disease, the absorptive function of the stomach and bowels being suspended, cannot be impeached; and taken in

* It was pointed out by Moreau in 1868, that section of the splanchnic nerves was followed, as in cholera, by an intestinal flux.

conjunction with the invariable improvement in the patient's condition, in all the cases described by Dr Little, such as the marked increase of the temperature, the sudden change of colour from deep lividity to diffuse redness, the fact cannot be gainsaid, that salines act by oxygenation, and that the practice of saline injections, as used by Dr Little, is founded on the soundest physiological basis. In confirmation of our opinion that the salines do so act, we may refer to the analysis of Dr Letheby already mentioned.* As the patient improved, *the quantity of urine voided was augmented, its colour improved, and the percentage of solid residue increased most markedly.* An impetus, as it were, had been imparted to the process of secondary assimilation, and the system became thus enabled to resume its proper function." To my humble powers of perception, the beautiful chain of sequences here unfolded is plain as a mathematical demonstration.

I think we have thus a rational explanation of the suppression of urine in cholera, as well as in certain cases of excessive gastro-intestinal irritation.

Choleraic suppression may therefore be taken as typical of the *variety of suppression due to altered chemical composition of the blood.*

If anything were wanting to corroborate these opinions, and those I have advanced in my pamphlet "On Therapeutics and Disease," of the soundness of which I am more and more convinced, certain states of the urine in cases of recovery from cholera furnish additional testimony.

* Review of Dr Little's article on the treatment of cholera with saline-alcoholic injections into the veins, in the London Hospital Reports, see Glas. Med. Journal, 1867.

In a kind and good-natured review of my pamphlet in "The Practitioner,"* my reviewer remarks, "Diabetes, again, which the author quotes as a disease of deficient oxidation, seems to us to lack altogether the proofs of such an origin; rather, if we trace it to its first beginnings, it would seem to depend upon obscure changes in the central nervous system, and even when the disease has developed the glycosuric shape, there is no proof at all of deficient oxidation of the tissues generally."

Let us examine how far these remarks are destructive of my theory. The reviewer writes as if I viewed the human body as a system having a twofold composition, or of matter subject to two conditions; the one the nervous system permanent in structure, the other, the remaining tissues of the body, subject to constant change. Now, the fact is, that the very integrity

* I may here take an opportunity of thanking my kind critics. When I reflect that not a little of my pamphlet was written in my student days, and chiefly formed my graduation thesis, the manner in which it passed through the ordeal of periodical criticism affords me gratification. At my *alma mater*, on the banks of the hallowed Molendinar, still meandering pleasantly *in fancy*, graduation theses were consigned, as a matter of course, to the tomb of all the Capulets, estimated at so much the pound of paper, doubtless to be examined towards the end of the millennial period, for the delectation of the wiseacres that must then exist. It would, in all probability, never have seen the light of day, but that it came in aptly as literary pabulum for a small local journal with a great mission—that mission to turn the money-changers and charity jugglers ignominiously out of the temple of *Æsculapius*, which, indeed, had been converted into a stable by the accumulation of the *fæcula* of quackery. The stable was, however, too foul—the task too Herculean. Sham religion threw her bewitching mantle around the abomination—as she is wont to do. Mushroom opulence and senile imbecility jealously guarded the monuments of their benevolence (!)—the profession, as a rule, could not appreciate—and this journal ceasing, one volume remains the expression of a feeble but honest rallying in defence of what *was* a noble and disinterested calling, whose chief boast it was to perform charity without trading upon it. Of my connection with *The Glasgow Medical Examiner*, may the time be far distant when I shall feel

of the nervous system itself is equally dependent on the same conditions as other parts of the body ; in fine, no part whatever of the body can be healthy unless there is an harmonious interdependence between the histolytic and histogenetic functions. I am quite cognisant of the fact that glycosuria can be artificially produced by irritation of the vaso-motor system, certain injuries of the medulla, and impressions on the fourth ventricle ; but that can in no way affect my belief that sugar, when formed normally, as it always is in certain parts of the body, ought, in order to the preservation of health, to be oxidised into carbonic acid and water. Without insisting that the initial change was deficient oxidation, I contended, rather, that in the unravelling of the chain of morbid sequences, a stage presented itself at which deficient oxidation played a most intimate part. Hence, I remarked in my pamphlet, "How it happens that by a certain pathological aberration, diabetes may be caused on the one hand, gout, rheumatism, and scrofula, &c., on the other, I cannot explain ; but I am satisfied if, for my own guidance, I have *discovered the direction in which* the peculiarities of causation must naturally be sought." What is the composition of sugar ?— $C_{12} H_{22} O_{11}$. It is nothing more than what is taken into the body with amylaceous and saccharine foods of all kinds. We know that it is the property of the body to reduce complex compounds to their most elementary forms, in contradistinction to that of the vegetable kingdom ; and we are equally certain that the

ashamed, while confessing that, though not always agreeing with the letter, I invariably did with the spirit—

"Vos et Cyclopia saxa

Experti. Revocate animos, moestumque timorem

Mittite. Forsan et hæc olim meminisse juvabit."

persistent presence of sugar in the urine is looked upon as an untoward occurrence, and that when it does so occur, assimilation is somewhere at fault; and that this fault is deficient oxidation the state of the urine in cases of recovery from cholera, as we have mentioned, makes very apparent, and confirms what has been already advanced on this point.*

After the prolonged suppression which is so characteristic a feature of this disease, the urine first secreted is albuminous, contains little urea, and is free from sugar. There is a relative deficiency of urea when albumen is present, and the occurrence of sugar is associated with the presence of urea in excess. What is the explanation of this? We have remarked above that in consequence of the blood stasis in cholera the tissues are not chemically transformed into the proper excretions, that the proteids consequently remained in the blood, and that the albumen was thus removed by the bowels. But reaction ensues—life has been sufficiently prolonged to exhaust the poison, and forthwith nature resumes her mysterious operations. The blood which finds its way first to the kidney is surcharged with albumen, some of which is consequently secreted, but as the oxidation of effete tissue advances, the albumen is required for the purpose of construction, and urea resulting from the oxidation of effete tissue replaces the albumen in the urine. The urea is in excess, because the work to be done has accumulated, and on account of the excessive demand made upon the oxygen, the kidney is presented with an intermediate compound in the form of sugar, which otherwise would have been oxidised up to carbonic acid and water.

* *Vide* Mr Sedgwick's paper, British Med. Journal, Dec. 1870.

I believe there *are* (for I can believe anything now) intellects which will not assent to the obvious conclusion to which these facts tend. Such have existed in all time, exist now, and will exist. Some men—not a few, I am sorry—are very jealous of the reduction of what *they* call science, to its simplest forms. Such men are generally great discoverers of “cures;” prefer building up—making diseases—in the maze of which to hide their ignorance, on which to base their own importance, and fascinate the stolid crowd.

Before passing to the consideration of other forms of suppression, those we have been considering may be dismissed by some reference to the indications of treatment. In idiopathic suppression we have seen that nature attempts vicarious elimination, and the true physician never turns a deaf ear to her behests. This should, accordingly, be encouraged by diaphoretics, warm baths, or more particularly hot-air baths, while emollient poultices and hot fomentations may be applied to the loins. The bowels, on the other hand, should be acted on by hydragogue cathartics, such as croton oil, elaterium, &c. It was at one time the custom to exhibit strong diuretics, even tincture of cantharides.* This practice I believe to be a bad one: the kidney is not suffering from palsy, as was once believed—it is more probably in some hyperæsthetic condition. The diet should be solid, small in bulk, and nutritious. And should there be marked irritability, benefit might be anticipated from such agents as belladonna, conium, &c.

* Like turpentine, cantharides causes pain in the testicle, extending not unfrequently to the thigh and leg, and specific irritation of the solar and spermatic plexuses.

The treatment of choleraic suppression involves that of cholera itself, viz., what we believe to be the rational treatment, alcoholic-saline injections into the veins, keeping up the warmth of the body, and maintaining in every possible manner the strength of the patient, until the poison is dissipated from the system. Opium, in large doses, is, in my opinion, contra-indicated in these cases, though this remedy has its enthusiastic advocates like everything else. Nature is kind, though too frequently the blind man with the club strikes his friend in the dark. There is already too great prostration, and it is difficult to conceive how opium could act except by aggravating this condition, particularly when it is borne in mind that either in large doses, or in small ones frequently repeated, general congestion of the capillary system is certain to be induced. I suspect that the gentlemen who cure cholera with opium are the same who *cure* typhoid fever with a drop of carbolic acid night and morning, and who were equally successful with *Sarracenia purpurea* in small-pox, in the last decade! Varieties of cure there are many, and the wonder is that there should be death at all!

SUPPRESSION FROM GOUT AND RHEUMATISM.

General Review of the Gouty and Rheumatic Diathesis, &c.

Suppression from gout and rheumatism belongs likewise to that form of renal derangement with which we have been occupied in the latter part of the concluding section, viz., that due to altered chemical composition of the blood. From cholera and other epidemic diseases, gout, rheumatism, and their congeners—of which more in the sequel—present the important

difference, that while the former are presumably due to morbid influences introduced into the blood *ab extra*, the latter are to be ascribed to physiological and chemical aberrations *ab intra*.

“The precise constitution of the blood is adjusted by the balance of the nutritive process for maintaining the several tissues, so that none of the materials appropriated for the maintenance of any part may remain in excess in the blood. Thus each part is in relation of an excretory organ to all the rest. For example, if the muscles did not take material for their nutrition, there might be an excess of fibrine and their other constituents in the blood; if the bones did not do so, the salts of lime might be in excess, and so on.”

—*Kirkes*.

Supposing this balance disturbed, what are the conditions most likely to have occasioned it? These may be of a twofold nature: first, a too abundant supply of any given constituent of the food; and, secondly, conditions which retard the normal metamorphosis of tissue, and thus prevent the appropriation of the new material supplied to the blood for the purpose of construction. Accordingly, experience shows that gout, rheumatism, and allied affections are met with, as a rule, in individuals addicted to an over-indulgence in nitrogenous diet and generous wines, combined with sedentary habits. These conditions are intimately associated with the presence of uric and oxalic acids in the blood, and their manifestations.

That there is an excess of fibrine in the blood in cases of rheumatism, analysis renders apparent. Thus, according to Alderson, 1000 parts of such blood consists of—

| | | |
|-------|-------|-------------------|
| 805.4 | parts | water. |
| 6.7 | „ | fibrine. |
| 101.0 | „ | blood corpuscles. |
| 86.0 | „ | residue serum. |
| <hr/> | | |
| 999.1 | | |

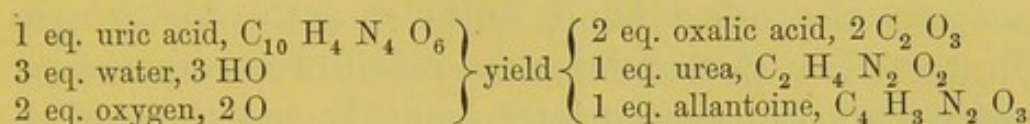
The solid residuum of the serum gave an average of inorganic constituents 7.9 in 1000 parts. As in healthy blood the component constituents are—

| | | |
|-------|-------|-------------------|
| 790 | parts | water. |
| 3 | „ | fibrine. |
| 127 | „ | blood corpuscles. |
| 80 | „ | residue of serum. |
| <hr/> | | |
| 1000 | | |

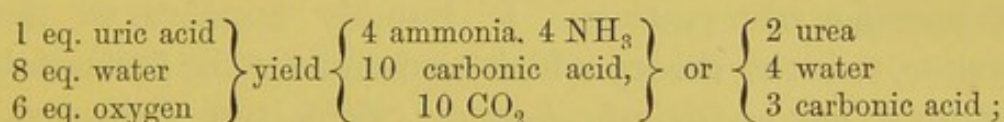
it is apparent that in rheumatism fibrine is present in more than double the usual proportion. By still more recent investigations the difference is made even greater, as it has been ascertained that the amount of fibrine in healthy blood is considerably less than 3 per cent.

Given, therefore, excessive indulgence in nitrogenous diet, which may account for the excess of fibrine in the blood, and conditions which retard the transformation of effete tissue, what is likely to result? First, fibrine in excess in the blood will render, to the extent that it so exists, the normal supply of atmospheric air for its required purposes in the economy, insufficient; while a sedentary life, independent of the foregoing, retards metamorphosis. Under these circumstances, it must follow that if urea, carbonic acid, and ammonia represent the full oxidation of the proteids by the body, there is nothing for it, so to speak, but a compromise, and the production of intermediate compounds must result. Under ordinary circumstances, when uric acid

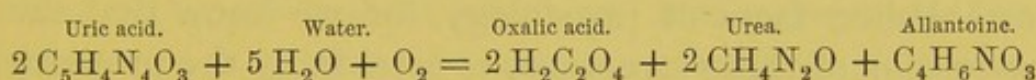
is formed, as it is in all warm-blooded animals, it must be further oxidised, or else, by its insolubility, it is deposited, or combines with alkaline bases, producing calculous diseases. Some of these changes and their interdependence may be thus represented—



or by more complete oxidation—



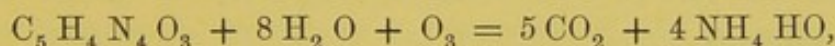
or by new notation—



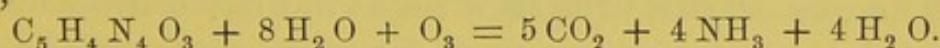
Complete Oxidation.



or,



or,



The foregoing being granted, it will follow that in proportion to the amount of oxygen consumed, so will be the amount of effete tissue reduced, and the quantity of solid matter, or representatives of effete tissue in the various excretions. Hence exercise ought to increase the amount, *e.g.*, of urea in the urine, carbonic acid in the lungs, &c.; but on this point the opinions of physiologists are at present diametrically opposed to one another. On the one hand, it is contended that urea appearing in the urine in great excess, after the exclusive indulgence in albuminous diet, must be derived from the disintegration of the nitrogenous com-

pounds *in the blood*. In negative support of this proposition, Dr Parkes brings forward the result of experiments to show that muscular exercise is *not* followed by an augmentation of urea in the urine, and is supported by the high authority of Professor Haughton; on the other hand, quite recently, Dr Austin Flint, of New York, relates the result of an experiment bearing a very different interpretation, and the subject being at this moment a *questio vexata*, merits more than a passing observation. It humbly appears to the writer, that the theory which contends for the formation of urea, *not exclusively, however*, from the disintegration of muscular tissue is more in accordance with the established facts of physiology, for we know that the reduction of these structures is essentially the property of oxygen, while, as we have indicated, it does not negative the supposition that *excess* of nitrogenous matter in the blood may be equally subject to the same change.

The quantity of urea in urine is increased after food, attaining its maximum about the third or fourth hour. When an animal is fed* exclusively on fat and water, or on starch and fat with a small admixture of albuminous compounds, or on sugar, the excretion of urea falls below that found in absolute starvation. The explanation of this seems to be, that when inadequate supply of food is administered, the animal consumes part of its own flesh to maintain heat; and hence in cases of absolute starvation more nitrogen is eliminated than when little food is supplied. But it does not follow that because excess of urea in the urine follows an excessive indulgence in protein compounds, that

* Carpenter's Physiology.

the urea is exclusively derived from that circulating in the blood. It is just as likely that the system only appropriates according to its wants, as determined by physical exertion, temperature, &c., and as we have just noticed, that the surplus nitrogenous elements in the blood add their quota of urea to that resulting from the metamorphosis of effete tissue.

During severe physical exertion there is more waste of tissue, more albumen is required for construction, and it is not at all impossible, nay, it would seem probable, that albumen, as it exists in the blood, is capable of yielding more urea than as it exists in combination in the animal fabric. The one view, then, is in no respect whatever antagonistic to the other.

It seems to me a remarkable fallacy that physiologists should persist in talking of the propriety of "sparing the tissues," inasmuch as the proper function of the tissues is, to such an extent, their destruction, life the resultant of the change; indeed, when any tissue is unduly retained in the system it may of itself constitute a *materies morbi*.

Among the foremost to dispute the belief that muscular exertion was not followed by an increase of urea in the urine was Dr Edward Smith. He remarked that with such violent labour as that of the tread-wheel, there was only an increase of 19 grains over that of light labour. In 1866, MM. Fick and Wislicenus investigated the result of violent exercise in their own persons, with reference to the urinary constituents. During the ascent of Faulhorn, about 2000 feet in height, having taken no albuminous food for seventeen hours previously, nor during the ascent which

occupied eight hours, nor for six hours after; their diet consisting of fat, starch, and sugar, the following results were obtained:—

| | The average quantity of nitrogen excreted per hour was for | |
|---|--|--------------|
| | FICK. | WISLICENUS. |
| 1. Urine of the night previous to ascent, a period of twelve hours, . | 0·63 gramme. | 0·61 gramme. |
| 2. Urine of the period of ascent, eight hours and ten minutes, . . . | 0·41 „ | 0·39 „ |
| 3. Urine excreted for six hours after the ascent, | 0·40 „ | 0·40 „ |
| 4. Urine of the night following the ascent, after a good meal had been taken—10½ hours, | 0·45 „ | 0·51 „ |

Here, with *no nitrogenous food* consumed, there was apparently a decrease of the nitrogen excreted.

Professor Haughton found that, with a daily walk of five miles, the amount of urea eliminated was 501·28 grs. per diem, while with a horizontal walk of 20·74 miles the excretion of urea was not more than 501·16 grs. Professor Parkes further gives the following as the result of an experiment on two healthy soldiers (S. and B.) of dissimilar bodily weight. During sixteen days they consumed in their food equal quantities of nitrogen. Their food consisted of bread, meat, vegetables, &c., in such proportion that their bodily weight was maintained almost constant. The experiments were divided into five periods. During the first period both men did their usual work; during the second, they remained for the most part at rest and in bed; during the third period they did their ordinary work; during the fourth period they were put to severe exertion, on the fifth day making a march of twenty-four English miles over level ground, and on the second day a march of thirty-

five miles ; during the fifth period they did their usual work. The quantities of urea excreted during the five periods are tabulated as under,—

| I. <i>Ordinary Work.</i> | | | | Grains. |
|-----------------------------|----|---|---|---------|
| Mean of four days, | S. | . | . | 36·374 |
| „ | B. | . | . | 37·134 |
| II. <i>Rest.</i> | | | | |
| Mean of two days, | S. | . | . | 38·348 |
| „ | B. | . | . | 39·100 |
| III. <i>Ordinary Work.</i> | | | | |
| Mean of four days, | S. | . | . | 36·223 |
| „ | B. | . | . | 37·534 |
| IV. <i>Severe Exertion.</i> | | | | |
| Mean of two days, | S. | . | . | 38·643 |
| „ | B. | . | . | 40·328 |
| V. <i>Ordinary Work.</i> | | | | |
| Mean of four days, | S. | . | . | 40·811 |
| „ | B. | . | . | 38·909 |

Liebig's explanation of the results disclosed in the above tables is, that they demonstrate that muscular exertion causes an augmentation of urea, though the increased excretion does *not take place immediately*, but at a subsequent period. Thus it will be noticed, that during the second period, though both individuals were at rest, the excretion of urea was increased, conformably, no doubt, as we have hinted, that the tissues were not operated on by the increased quantity of oxygen circulating in the blood, until the supplementary amount of proteids which it contained were reduced to normal excreta. This view is also confirmed by the experiments of Fick and Wislicenus, in whom also the amount of urea was markedly increased *after the exertion*.

In Dr Parkes' cases, again, during the third period, the amount of urea excreted was the same as in the first; it increased markedly during the fourth; while in the fifth period it was higher than during the first and third periods. It is particularly interesting to notice that during the second period the weight of the body decreased, during the third it increased; decreased considerably during the fourth, and was restored to its original weight during the fifth period. The loss of weight suffered during a long march by both individuals was considerable, both with ordinary diet and nitrogenous diet. In the case of S., the loss of weight during this period amounted to 5 lbs. and 4 lbs.; in the case of B., $4\frac{3}{4}$ lbs. and $1\frac{1}{2}$ lb. The reason for this loss of weight cannot be doubted. Both individuals may have lost fat by a greater consumption of oxygen during the severe work; but the greater part of the loss was undoubtedly water,—not, indeed, liquid water that could be replaced by drinking, but water that was combined in the muscles and tissues, and had been set free in consequence of the metamorphosis or consumption of muscular substance. The slow restoration of the bodily weight and the necessary co-operation of the food, prove that the tissues which, in their natural condition, had retained the water eliminated, were altered in their character; four days elapsed in the case of S. and B. before they had again acquired their original weight.

Of the total quantity of force capable of being generated in the animal body, a portion is applied in performing interior work, comprising (*a*), all involuntary motions of the blood and respiration, &c., (*b*), for working up the food into those substances which serve

for the construction and restoration of organs ; and it is only the portion remaining after these operations have been performed that is available for the performance of external work.—(*Liebig.*)

Considering the very opposite conclusions arrived at, such as those presently to be noticed by Dr Flint, and the discrepancies of opinion among physiologists, may it not be suggested that muscular tissue breaks down in a particular order—the less stable first—and that experiments to be reliable must be prolonged for certain periods ?

Dr Flint's interesting and highly important observations are as follow :—Some time ago he had an opportunity of examining the urine of a gentleman who performed the pedestrian feat of walking 100 miles in twenty-one hours and thirty-nine seconds. On this occasion, his examination of the urine led Dr Flint to form conclusions opposed to doctrines recently gaining ground. He found the urea so considerably in excess, presuming on ordinary diet having been partaken of, as to indicate that it resulted from increased muscular exertion. Certain data being wanted to form reliable conclusions, Dr Flint waited for a further opportunity of testing the matter, and which soon presented on Mr Weston, the pedestrian referred to, undertaking to walk 400 miles in five consecutive days, on one of which he was to have walked 112 miles in twenty-four consecutive hours. Mr Weston's diet was in no way interfered with. That which he was about to eat was weighed, that left likewise weighed, and the difference estimated as consumed. The fæces and urine were carefully weighed and analysed. Mr Weston underwent but little training ; he ate well,

but it is noteworthy that he habitually excreted a more than average amount of urea,—the quantity being 628 grains, being 33 per cent. more than Dr Parkes' estimate. Mr Weston's weight was only 120 lbs., and as the excretion of urea is in the ratio of 3·5 grains per lb., 420 grains would represent the normal quantity. Mr Weston walked as follows:—80 miles the first day, 48 the second, 92 the third, 57 the fourth, 40½ miles on the fifth day, in all 317½ miles in five consecutive days, thus losing his wager, it will be noticed. The elimination of urea was 722 grains per diem on an average. Five days afterwards he took but little exercise, though, as in the cases already referred to, his excretion of urea amounted on a daily average to *not less than 727 grains*.

Dr Flint remarks, that during the five days of violent exercise Mr Weston consumed 1174 grains of nitrogen, in which time he eliminated in his urine and fæces 1808 grains of nitrogen, leaving a difference of 634 grains of nitrogen which must have been derived from the waste of muscular tissue. Estimating the percentage of nitrogen in the muscular tissue at 3 per cent., 634 grains would represent a loss of 21·127 grains, or 3·018 lbs. of muscular tissue. The actual loss was 3·450 lbs., allowing 0·43 lb. unaccounted for, which it is suggested might be fat or water. During the five days' rest succeeding the walk, Mr Weston gained in weight 4·5 lbs., and retained in his system an amount of nitrogen equivalent to 1·1 lb. of muscle.* Dr Flint arrived at the following conclusions:—"If these facts be accepted, and leaving the widest margin for error in the estimate, they cannot involve any considerable

* British and Foreign Med. Chir. Rev., and Practitioner.

error, it is impossible to come to any other conclusion than that excessive and prolonged muscular exertion increases enormously the excretion of nitrogen, and that the excess of nitrogen discharged is due to an increased disassimilation of the muscular substance; and it is to be remembered that the experiments on which this statement is based were made with a diet regulated solely by the taste of the individual." This question, then, may at least be said to be *sub judice*.

How does it affect the pathology and therapeutics of gout and rheumatism? It is admitted that urea, carbonic acid, water, and ammonia, &c., are the results of the ultimate oxidation of effete tissue; but it does not follow that these are the results of direct oxidation; nay, it is rather more probable that they are the results of a series of chemical evolutions. If they are the results of oxidation, and if in certain states, as under the influence of great bodily exertion, a relatively larger amount of oxygen is consumed by the body, the conclusion is irresistible that increased tissue metamorphosis must be manifested in increased excretion, if not in urea, at least in some of the other excretions, such as carbonic acid and water. According to Dr Smith, carbonic acid is much increased by muscular exertion.

It is not absolutely contended, then, that urea is *directly* formed in the depths of the tissues, as the researches of Dr Parkes and others render it highly probable that the liver is the organ by which urea is elaborated from less oxidised material presented to it.*

* In the "Centralblatt für Medizin Wissenschaft," Dr Cyon, of St Petersburg, has published the result of researches made by him on this subject. Blood withdrawn from the carotid arteries of dogs was rapidly defibrinated; a portion of it was placed in an apparatus by which it was propelled by me-

This is very clearly indicated by the absence or diminution of urea in cases of cancer of the liver, or atrophy of this organ. Uric acid and the lower compounds generally are doubtless formed in the minute capillaries.

Looking at all these facts, the inference seems to me perfectly legitimate that, in cases of gout and rheumatism, with an excess of fibrine in the blood, urate of soda deposited in the joints, uric acid in the blood, an excess of uric acid in the urine, evidence of sedentary habits and excessive indulgence, affections of the white tissues, such as the sheaths of muscles, aponeuroses, bursæ, capsular ligaments, pericardium, and endocardium, &c., from which it would appear lithic acid is chiefly formed in tear and wear of the body; I say, taking all these facts together, it seems proved to a demonstration that deficient oxidation of effete tissue must be looked upon as the immediate cause of these affections,—a theory, as I have* elsewhere pointed out, corroborated, likewise, by what occurs in the pyrexia, in which class of diseases there is excessive oxidation of tissue, as represented in excessive excretion of nitro-

chanical pressure through the liver. Three canulæ were introduced; one into the inferior vena cava, a second into the hepatic vein, and a third into the portal vein. The first of these was connected with an aspirator consisting of two cylinders partly filled with mercury; the other two were connected with the vessels containing blood. The blood was now allowed to flow through the liver; and, after it had flowed through the organ several times, the quantity of urea was determined by Liebig's method, and compared with that of the ordinary blood of the animal. The blood which passed through the liver was found to contain a larger quantity of urea. In 100 cubic centimètres of blood sent twice through the liver of a moderately sized dog, there was 0·14 gramme of urea; in the same quantity of blood not so treated, the amount was 0·09 gramme. When the blood was sent through the liver four times, the amount of urea in 100 cubic centimètres was 0·176 gramme; that in a similar quantity of the ordinary blood of the animal being 0·08 gramme.

* Author's "Observations on Therapeutics and Disease."

genous compounds from the body, and in the treatment of which we empirically give such agents as counteract oxidation, viz., quinine, arsenic, alcohol, &c.; while on the other hand, our treatment of gout and rheumatism (the most successful treatment, at least) is such as harmonises with these views.

But the excessive formation of uric acid is not alone to be ascribed to an excessive indulgence in proteids. Anything which will directly interfere with the due conversion of tissue will have a like effect, and the inordinate use of wines has been recognised from antiquity as a factor in the formation of such aberrant processes as occasion gout and rheumatism—*par excellence*, port wine. “How many men,” remarks a recent writer,* “dare not drink port wine under fear of gout, which will show itself even next day! The action of the renal cells is checked by the astringent, and thus the uric acid is no longer converted by them into urea and carbonic acid.”†

We may admit the fact, certainly, without admitting the theory, which, it need scarcely be remarked, is in direct antagonism to modern physiology. The kidneys do not form urea, they merely remove it from the blood, as has been already amply indicated.

Again, other liquors than port wine predispose to the development of the uric acid diathesis; and it is a mistake to suppose that gout is absolutely a patrician disease, found only, as Sydenham remarks, among the “*magni reges, dynastæ exercituum, classiumque duces, philosophi, alique his similes.*” It is probable,

* Dr Fothergill, Leeds.

† *Vide* paper by M. Grehant in Brown-Séquard's “Archives de Physiologie,” 1871.

rather, that alcoholic liquors tend to the formation of uric acid just in proportion to the amount of alcohol they contain, for we know that alcohol diminishes the active disintegration of tissue, and is properly given in fevers for this purpose; while in health it may, for the very same reason, cause an accumulation of intermediate compounds in the blood—a fact borne out by the frequency of liver affections in drunkards, such as cirrhosis, and eruptions on the face—*acne rosacea*—or, as they are known popularly, “whisky blossoms.” If the liver has something to do with the formation of urea, its function being thus interfered with, structural changes may be induced; while *acne rosacea* is suggestive enough of blood impurity. Again, Dr Budd relates that, in a class of men employed in the Thames for the purpose of raising ballast from the bottom of the river, and who consume *from two to three gallons of porter daily*, gout is remarkably frequent.

Lactic acid was at one time supposed to be the *materies morbi* of gout and rheumatism, but there is no evidence to show that it has any claim to be so regarded.

In my pamphlet on “Therapeutics and Disease,” I pointed out that, in the group of diseases associated with the production of such intermediate compounds as uric acid, oxalic acid, &c., the obvious indication of treatment was to further oxidise these products in order to form normal excreta, and thus prevent their deposition in the form of calculi, gouty concretions, &c., and I showed how the physico-chemical fact of this transition threw light on the various morbid conditions in which empiricism had proved the employment of alkalies to be beneficial.

Recapitulating our argument briefly, we have seen

that certain habits of body are prone to occasion an undue accumulation of proteids in the blood; that they are absolutely in excess relatively to the requirements of the system, and relatively to the amount of oxygen consumed; that urea, carbonic acid, and ammonia represent the full oxidation of proteids; and that, when this process is imperfect, the formation of intermediate products must take place—call them what we will; and,* despite what has been said to the contrary, I must insist that there are the most rational grounds for the belief that the *materies morbi* of gout, rheumatism, and neuralgia are the result of the imperfect oxidation of effete tissue—a theory, besides, borne out by the treatment most successfully employed.

In gout and rheumatism, then, it is inferred theoretically, on the best possible grounds, and practically on the evidence of our senses, that there is an excess of uric acid circulating in the blood; and, *prima facie*, it might appear that, in conformity with Graham's law, diuresis, and not suppression, would be more likely to ensue in these diseases. But it must be remembered that the kidney is a living organ, that it secretes in obedience to a law of material correlation, that the dialysing property of crystalloids is various, and that uric acid may possess properties which originate pathological actions which may counteract a purely physical law. It so happens.

In the milder forms of the uric acid diathesis crystalline deposits of red sand are observed in the urine, micturition is frequent, scanty, and painful, and pain is frequently referred to the loins.

* *Vide* Review of "Observations on Therapeutics and Disease" in Practitioner 1870, vol. v.

Of these phenomena the explanation must be the presence of these minute crystals in the urine; and in particular instances these crystals become engaged in the structure of the kidney, and it is in such cases that suppression, more or less complete, is found. The first effect of irritation thus occasioned may be a determination of blood to the part, and, consequently, temporary augmentation of the secretion, but the irritation being protracted, new pathological states are induced as the results of inflammation. Then coagulable lymph becomes effused into the glomeruli or tubuli uriniferi, and to the extent that this will happen suppression will be more or less complete; and hence, owing to a disturbance of balance from obstruction, albumen is found in the urine passed; or again, these crystals acting as foreign bodies, may excite absorption of the structure of the kidney, or cause ultimate suppuration.

Treatment.—It will be obvious that the treatment of this form of suppression, after relieving the urgent symptoms by anodynes and depressants for the purpose of relieving spasm, will resolve itself into the treatment of gout and rheumatism. To accomplish the first indication, selection will naturally be made of opium, belladonna, or some kindred agent, with ipecacuanha, possibly in form of Dover's powder, hot baths, and emollient applications to the loins, &c. With respect to the latter—the treatment of gout and rheumatism, or prophylactic treatment of gouty or rheumatic suppression—experience has shown that the alkalies are the remedies most beneficially employed. That this should so happen will be apparent from what has been already adduced regarding the etiology and pathology of these diseases. The alkalies do not neutralise the uric acid,

as was at one time supposed, but they prevent its formation to the extent that it constitutes a *materies morbi* by oxidising it up to urea.

Lemon juice, of which the chief constituent is citric acid, has likewise been shown to possess remarkable therapeutic properties in these, as well as in other affections due to contaminated blood, and this undoubted fact for some time acted as a *pons assinorum* to believers in the uric acid theory, and by their opponents was used as an argument against the soundness of the belief therein implied. I pointed out elsewhere that the fact was overlooked that the vegetable acids were converted into carbonates in the blood, that the carbonates promoted oxidation, and that this objection to the theory rather confirmed than weakened its soundness.

Of the form in which alkalies may be administered there is room for much choice. The effervescing citrate of magnesia is an elegant preparation, from the use of which much benefit might be anticipated. Peroxide of hydrogen is certainly deserving an extended trial in gout and rheumatism, as likewise the exhibition of permanganate of potash. Large draughts of pure water should be administered, for, according to Genth, these cause even a total absence of uric acid in the urine. They might, at least, be expected to favour the solution of uric acid in the blood; or, more probably, they act by oxidising, the water being decomposed, its hydrogen contributing to form ammonia, and its oxygen urea.

It is interesting to notice that colchicum, of whose efficacy in these affections antiquity testifies, seems to act by increasing the amount of urea by diminishing that of uric acid. The acetic extract may be beneficially

combined with blue pill, as in these cases there is not unfrequently a torpid condition of the liver. With respect to dietetics, animal diet, it will be obvious, must be restricted, post-prandial potations reduced, however reluctantly, to a minimum, and vegetable diet enjoined, combined with as much out-door exercise as possible or practicable.

We have thus a rational explanation of the most successful treatment of gout and rheumatism, and consequently the best prophylactic treatment of the form of urinary suppression arising therefrom. To the mint-water philosophers it may be said, if all treatment be equally good, it is surely preferable to have one which commends itself by its rationality to our intelligence, than no resting-point in judgment on which to base questionable procedures.

SUPPRESSION OF URINE FROM RENAL CALCULI.

Should the crystals of uric acid, to which we have referred in the foregoing section, be detained from some cause or other in any of the urinary cavities, instead of being expelled with the urine, they may form the nuclei of calculi, by the deposition on them of solid matter from the sediments of the urine, or determine precipitation therefrom *in transitu*. When small, these deposits are usually termed gravel; when large, the term calculi is applied to them. As there are many intermediate compounds existing in the urine in unhealthy conditions, so is there a corresponding variety of calculi. These calculi may consist simply of one of the solid compounds of the urine, a combination of several constituents in one homogeneous mass, or in

varying crescentic layers. The calculi of most common occurrence are those of uric acid, oxalate of lime, ammonio-phosphate of magnesia, and basic phosphate of lime, the last two usually occurring in combination. They possess the following characteristics as to consistence, colour, and indications. Uric acid calculi are usually of a reddish, or a reddish-brown colour, and tolerably hard. Their presence indicates mal-assimilation. Oxalate of lime calculi, when small, are of a pale colour and smooth, and are of more frequent occurrence in youth; if large, they present a rough nodular surface, and are consequently designated *mulberry calculi*. On account of this irregular surface they occasion acute pain in the urinary passages, inflammation, and the usual consequences of intense irritation. In consistence they are hard.

It is difficult to explain how oxalate of lime, which is almost insoluble in aqueous solutions, should find its way into the urine. According to C. Schmidt, oxalate of lime forms in the blood a soluble compound with albumen, and transudes the renal capillaries in a fluid condition, and is separated in the urinary passages; or oxalic acid may unite with the lime for the first time in the urine. Kletzinsky, on the other hand, offers the following explanation:—Oxalic acid and lime, when in very dilute solutions, require a considerable time for combination; and he performed the following experiment, which renders it not improbable that oxalate of lime may be formed on the free surface of the uriniferous tubes. To urine, rendered strongly acid with acetic acid, oxalate of ammonia was added, and this solution was passed through a four-fold filter, and it was found that a fine crystalline cloudiness of

oxalate of lime was always formed in the clear filtrate which passed through the fourth filter. This fluid he again introduced into an endosmometer closed with an ox-bladder, and dipped the free surface into pure lukewarm water. In the space of two hours crystals of oxalate of lime were found in the water outside the bladder. It is apparent, in this case, that the union of the oxalic acid with the lime could not have taken place in the endosmometer, but that the salts transuded in the form of acetate of lime, and oxalate of ammonia, both very soluble salts. In one or other of these ways oxalate of lime must be formed. The oxalic diathesis, as we shall see in the sequel, is undoubtedly one of the various manifestations of mal-assimilation.

The ammonia-phosphate of magnesia and basic phosphate of lime calculi are usually found in cases where urine is apt to be retained too long in the bladder, or in cases of chronic cystitis, whereby the diseased condition of the mucous membrane induces decomposition of the urine. These calculi attain to a large size, are of a whitish colour and porous, and break down easily by means of the lithotrite. Of the rarer calculi may be mentioned xanthic oxide, cystine, calculi of protein substances, urostealith, carbonate of lime, and natural phosphate of lime. But though these are rarely met with uncombined, they not unfrequently form constituents of the more complex calculi.

It appears that certain relations exist between the amount and nature of certain of the urinary solids and particular portions of the body. Thus, in affections of the brain and spinal cord, the phosphates are in excess, and this may be due to the fact that these structures are to such an extent composed of phosphorus in combination

with fatty substances. Like all the other acids formed in the disintegration of effete tissue, phosphoric acid is the result of the oxidation of the phosphorus introduced into the system in combination with the proteids. This relative interdependence, as well as other pathological phenomena of an instructive nature, are well illustrated in the following highly interesting case which occurred in my practice, and which originally appeared in the following form in the "Glasgow Medical Journal :"—

H. N., aged eleven, of a decidedly strumous cachexia, but who was up to this period considered to be in good health, was observed, on the 14th December 1866 (Friday), when coming from school, to walk with a tottering gait, indicating difficulty of locomotion. A few days previously she complained of slight pains in her back and legs, which her mother considered to be "growing pains," so little alarming was their nature. On the following day (Saturday), muscular power in the lower extremities was impaired to such an extent that when patient knelt down, or otherwise placed herself in a recumbent position when amusing herself, as she did at play with the other children of the family, she was unable to get up without assistance. So far from giving her anxiety, and so slight was the pain, that she seemed rather amused at her helplessness. On the evening of Sabbath the 16th, I saw her, professionally, for the first time. I desired her to walk, which she seemed to do with considerable difficulty, dragging her legs along, and now and then extending her arms for support to prevent her falling, of which she seemed to be in constant dread. On making a careful examination of the region of the spine, no pain on pressure could be elicited, and there was at this

time a singular absence of inflammatory action. Sensation in the lower extremities, particularly towards the feet, was also impaired, as tickling of the soles produced no reflex action. A mustard hip-bath, and the application of a sinapism to the lower region of the spine were recommended, and a powder containing calomel and scammony was administered. Between Sunday night and Monday morning the medicine operated; but the patient was then quite unconscious of passing her evacuations, and now she was unable to stand unsupported. On Monday, the symptoms presenting a more aggravated nature, a cantharides liniment was directed to be applied along the spine, with a moderately soft flesh-brush; and inflammatory action having become more decided, a mixture containing bichloride of mercury, in very small proportion, with iodide of potassium and tincture of cinchona, was prescribed, with a moderate allowance of nutriment. Sensation and motion were now completely absent from the lower part of the abdomen downwards. Day by day the disease extended, till at length the paralysis was perfect from the neck downwards, and even the motions of the head were so little under muscular control that it inclined by gravitation to any direction, as support was withdrawn. About the 23d, symptoms of severe irritation of the nervous centres presented themselves; there being every indication of cerebral and meningeal irritation, delirium, subsultus tendinum, extreme restlessness, quick hard pulse, contracted pupil, and the occasional utterance of that plaintive cry painfully pathognomonic of head affections. The above mixture was still persevered in, and the back having previously been carefully vesicated, was not

further interfered with. The strength was assiduously kept up by the frequent administration of beef-tea, and small quantities of brandy, which the patient seemed to prefer to any kind of wine. The function of deglutition became imperfect, the constrictor muscles of the pharynx doubtless participating in the general paralysis, and respiration being similarly affected, mucus had accumulated to such an extent in the trachea as to threaten imminent suffocation. On the night of the 24th, the disease may be said to have reached its acme—the strength seemed failing, the pulse became weaker, and in consequence of the state of the chest, the breathing was extremely laborious, the smallest accessory muscles of respiration being called into action.

On the 25th, patient most unexpectedly rallied, and continued much in the same condition till the 29th, when once more death seemed imminent. From the 31st patient's progress was such as to inspire hope; power of motion and sensation gradually returned to the right hand, but not until nearly the expiry of three months could both hands be used with tolerable freedom; the left hand having much more tardily and more imperfectly regained its power. I should have mentioned that on the 25th, when my friend, Dr Irvine of Glasgow, saw the patient, the bladder was found full, necessitating for the first time the introduction of the catheter, which, however, I was obliged to use regularly afterwards for about three weeks; after which time, on the introduction of the catheter on several occasions, it was found that no urine escaped, the sphincter of the bladder and muscular fibres of the urethra having become so completely paralysed that *such urine as was secreted* dribbled away continuously.

skin, the pulse was accelerated, thirst was complained of, and patient was occasionally bathed in perspiration; those symptoms having been ushered in with a distinct rigour. On Sabbath there was no improvement. Distressing vomiting ensued, accompanied with extreme depression, anxiety, and frequent sighing. On Monday morning it was obvious dissolution was at hand; the lips were dry and parched, the countenance presented a sallow hue; there was rapid emaciation, and at 5 o'clock P.M. death terminated a protracted suffering most patiently borne.

Autopsy, three days after death, with the assistance of Dr A. K. Irvine.—Body fresh, but much emaciated. Bladder walls much thickened, lining membrane presenting a bluish colour, with a considerable quantity of adherent mucus, and a calculus about the size of a bean, found occupying the fundus. A fistulous communication existed between the rectum and the vagina, near the anus. Uterus small, but healthy. Right ureter being cut, pus was observed to escape therefrom. It was thereupon ligatured, and a careful dissection made with a view to examination of the kidney. Kidney was found to be about twice its normal size. On section, it showed well marked structural disorganisation; its surface presented several white patches, and a large abscess occupied the pelvis, in the cavity of which several small calculi existed. The left kidney was comparatively healthy. Spinal cord being examined, considerable effusion was found in the canal, with vascularity of the meninges. The structure of the cord was atrophied, and disorganised to such an extent that the cineritious could not be distinguished from the medullary matter; and at a point correspond-

ing to opposite the third dorsal vertebra, for about one inch and a half, the cord had undergone puriform softening to such a degree as almost to sever it from the higher portion. On raising the shoulders a good deal of effusion escaped, but circumstances did not permit of a further examination being made.

Observations.—The immediate cause of death in this case was undoubtedly pyæmia. As to the order in which the several diseases occurred, judging from the size and other conditions of the right kidney, I think it reasonable to infer the pre-existence of its disease to that of the spine. The predisposing cause of the entire condition I believe to have been tubercle. Was there any pathological interdependence between the renal and the spinal affection? Doubtless reflex irritation from a diseased kidney might predispose to the inflammation of the cord, and it in turn to tubercular deposition. The calculi to which I have referred, originated in the kidney, passed through the ureter into the bladder, and became there enlarged by successive depositions of solid matter from the urine, as it dribbled away as above described. Fæcal matter was latterly observed to come from the vagina, in consequence, as we saw, of the recto-vaginal fistula; that aperture, I surmise, must have been due to the impaction of one of the largest calculi in that region, and consequent inflammation and sloughing in textures whose vitality was so depressed.

By occasioning inflammation and its consequences, such as abscess, &c., in the kidney, calculi may cause suppression of urine, by destroying portions of the tissue of the organ.

But the temporary presence of calculi in the pelvis

of the kidney occasionally causes suppression, independent of structural changes, or even inflammation; this is occasioned no doubt by irritation of the renal branches of the sympathetic.*

In these cases serous effusions are particularly liable to occur, and their presence is independent of mechanical obstruction in the larger vessels; doubtless the explanation is furnished by Graham's law, whereby it is shown how liable solutions containing crystalloids are to transudation. The symptoms of renal calculi have been already referred to, and the treatment in the cases under consideration must be conducted on general principles.

Should the patient be plethoric, and the pulse afford evidence of inflammatory action, depletion from the arm—a remedy to which the profession will doubtless return at no distant date—may be had recourse to. Blistering the loins has been advocated, and though this remedy certainly seems to be contra-indicated, its use is alleged to be beneficial.

OXALURIA.

We have already seen that of the intermediate compounds formed from the proteids, oxalic acid is one. Of course, suppression of urine from the presence of oxalate of lime calculi does not possess any special characteristic; but the presence of oxalate of lime in the urine is usually attended with peculiar constitutional symptoms of such a definite nature as to have justified, so to speak, the raising of this condition to

* Dr Schmidt, of Rotterdam, ascribes Addison's disease to a morbid condition of the abdominal sympathetic.

the dignity of a diathesis ; and the subject, from its intimate relations to the subjects we have already considered, merits a passing notice.

It may be illustrated by the following case, which came under my notice quite recently.

E. T., a gentleman aged about 40 years, of spare habit of body, and accustomed to generous living, consulted me on the 1st November 1871, regarding certain peculiar symptoms which made their appearance during the past six or nine months. This gentleman lives in a remote island, of which the sole inhabitants are his own household. To adopt the phraseology of a distinguished politician, he may be said literally to live "in a damp climate, contiguous to the melancholy ocean." He feels an uneasy sensation in the hypogastrium, is troubled with frequent micturition, and his urine is frequently opaque and scalding. He has occasional dull, aching pains in the loins. He finds himself more restless and irritable than he used to be ; is easily annoyed, and believes his brain is more or less affected ; he suffers from occasional *ennui*, which he naturally ascribes to his solitary life. He is apt to "get muddled" occasionally, and not unfrequently to be overcome with drowsiness, which excitement of any kind, however, speedily removes. Frontal headaches are frequent ; bowels regular ; pulse normal. Patient was "in the way of" indulging pretty freely in alcoholic liquors.

On submitting a small specimen of his urine to examination, it presented the following characteristics. Turbid ; and on standing for some time, deposited the usual brick-red urate of ammonia, which instantly disappeared on heating, to reappear again on cooling.

The urine gave a decidedly acid reaction ; and tested with heat and nitric acid, gave *no indications of albumen*. Both the supernatant fluid, and the fluid clarified by heating, were subjected to microscopical examination, and revealed an abundance of *very perfect tube casts*, dividing dichotomously, very minute, and surrounded by small cells and granular matter. One of the tubes presented the appearance known in surgery as green-stick fracture. With the aid of a higher magnifying power, octohedral crystals of oxalate of lime were discovered in considerable abundance.

This, I believe, to have been a characteristic case of oxaluria, affecting both the kidney and bladder, giving rise in both to inflammatory irritation. It may seem singular, perhaps, that tube casts should exist in the urine independently of the presence of albumen : but that they did so occur in this case an examination by others as well as by myself left no room for doubt. Conformably with what we have seen to be the close relationship between the complete excreta and the presence of oxalate of lime in the urine, it is observed that this compound occurs in cases where an impediment to the respiration exists, as in emphysema ; in persons who lead a sedentary life, and are addicted to the use of generous living. In the light of what we have advanced above, the explanation will be too obvious to necessitate recapitulation.

Dr Begbie described some additional symptoms, such as a feeling of weight and pressure at the pit of the stomach, together with flatulence and palpitations a few hours after eating ; a loaded tongue, dry skin, and irritable pulse ; and a tendency to certain cutaneous diseases, such as carbuncles, psoriasis, &c. Oxalic

acid, as we have already seen, is one of the compounds formed if the oxidation of uric acid has not been carried sufficiently far. Its relationship to uric acid has been practically demonstrated by Wohler and Frerichs, who found that when uric acid was introduced into the organism, it was followed by the presence of oxalate of lime in the urine.*

With respect to the treatment of the oxalic acid diathesis, it will be at once apparent, that if the rheumatic and gouty diathesis are correctly treated on the principles already laid down, the same must obtain in this case. Hence Dr Begbie has strongly recommended the employment of nitro-muriatic acid, a powerful oxidiser, but whether it possesses any advantage over the alkalies in this respect, I am unable to affirm.

SUPPRESSION FROM CONGESTION, INFLAMMATION, AND OTHER DISEASES OF THE KIDNEY.

A very brief review of the chief conditions under which the material correlation of the gland itself relatively to the blood is destroyed, claims our attention under this section.

Congestion of various organs, it may be submitted as a rule, is a condition usually seen by fools. At least, my experience has taught me to attach little importance to the discrimination of the frequent discoverer of "congestions." How there can exist congestion of any organ, independent of static conditions on the one hand, and inflammation on the other, I have never been able to determine. Yet, like every other conceivable, and not a few inconceivable diseases, con-

* *Vide* "Observations on Therapeutics and Disease."

gestion is frequently diagnosed by a process of reasoning to me equally inexplicable.

A little humiliation therefore, it may be alleged, becomes the writer whose mental grasp is of such a mediocre order. But that congestion of the kidney does occur under particular circumstances, it would be folly to deny; and that it may thus interrupt the flow of blood through the organ, and consequently, the excretion of urine, it would be equally ludicrous to gainsay. In proportion to the degree of obstruction thus offered to the return of the blood in the renal veins, so will the amount of urine be diminished, and albumen in the urine be augmented. This state may arise chiefly from two causes, viz., cardiac asthenia, either from organic diseases of the heart, or as a concomitant of fever, cholera, or like states of the system, or from valvular insufficiency in the heart, whereby the weight of the column of blood falls upon the lower parts of the body, being unrelieved by the state of the valves; or from certain conditions, such as spasmodic asthma, which prevent free pulmonary circulation.

Contusion of the kidney has been assigned a place in the etiology of suppression, but it is difficult to isolate the effects of contusion from congestion in the first place, and inflammation in the second. It is probable rather that a fall upon the loins, of sufficient severity to occasion suppression, would be found to do so, either by occasioning temporary congestion, or exciting inflammation; consequently, contusion, as such, ought not to be considered among the primary causes of suppression.

Like all other organs of the body, the kidney is liable to inflammation; and it is undoubted that this pathological state plays an important part in all cases

of suppression from irritation, however caused. Inflammation of the kidney may be due to various causes ; some internal, as we have seen, due to aberrant physiological states of the body, or the administration of irritating internal remedies, such as turpentine, cantharides, &c. ; others external, as exposure to cold, blows, &c.

Suppression from inflammation may be of considerable duration. In a case related by Dr Laing of Fochabers the function of the kidney was suspended for nine or ten days, without any bad effect, the bowels having been freely acted on by drastic purgatives during that time ("Edin. Med. Jour.," vol. x.).

Inflammation of the kidney is usually recognised by the following symptoms. Pain of an intermittent nature in the loins is complained of. In front, the pain sometimes extends to the epigastrium upwards, and downwards to the penis and testicles, the latter of which are retracted. The secretion of urine is either completely arrested, or is secreted guttatim ; and micturition is attended with pain. The urine, at first clear, ultimately becomes slimy, and sometimes gravelly. During the paroxysms of pain there is nausea and vomiting, and a feeling of tightness in the belly. There is likewise inflammatory fever. The duration of the attack, in cases of recovery, varies from a few hours to a few days. In fatal cases, inflammation may go on to suppuration.

Treatment.—Recalling the conditions which occasion congestion, it will be obvious that if renal congestion be due to cardiac asthenia, our object is to stimulate the action of the heart, and experience has demonstrated that this is best accomplished by the exhibition of

digitalis, which acts as a stimulant, and not a depressant. If alcoholic stimulants be deemed advisable, they must be given in small quantities. Thus administered, benefit should accrue from their employment. They diminish tissue change, and consequently less work is imposed upon the kidney, less urea being formed. It is principally their narcotic manifestation that must be guarded against.

The presence of albumen in the urine, it may be observed, is *not* necessarily indicative of disease of the kidney. It may be due to a peculiar condition of the albumen in the blood, induced by various diseases.*

* Albumen is found in the urine when the blood contains an abundant amount of water, or a diminution of albumen. These states are relatively termed, hyp-albuminosis and hydræmia. This simply bears out what has already been advanced regarding the co-relation of the structure of glands to the condition of the blood circulating through them. If water exist in the blood in excess of the normal proportion which in health it bears to albumen, or if the albumen be relatively diminished, which amounts to the same thing, the constitution of the albumen is so altered that it transudes through the renal capillaries. (*Vide* footnote, page 21).

Albumen acted upon by the gastric juice no longer retains the characteristics by which this substance is usually recognised. Heat and nitric acid have no effect upon it now, and it dialyses much more readily than albumen as it exists in the white of the egg. Bernard has shown that albumen introduced into the blood speedily renders the urine albuminous; hence there must be a difference in physical property between albumen acted upon by the gastric juice (albuminose), and albumen as it ordinarily exists.

Dr Pavy has shown that not only does albumen so introduced appear speedily in the urine, but in like manner milk and gelatine, and even the serum of one animal introduced into the blood of another. Dr Pavy accordingly infers "that these proximate principles are not adapted, in the state they are met with in our food, for retention in the system, and administration to the requirements of the economy." But, further, we recognise the presence of albumen in the urine by means of heat and nitric acid, and if this albumen be in the same isomeric condition as that existing in the blood, it follows that it has undergone yet another change since being acted upon by the gastric juice—that it has returned to its former state.

Dr Pavy is disposed to account for albuminaria on the supposition that the

The same treatment should be enjoined in cases of valvular imperfection. Farther, we endeavour to equalise the condition of the circulation by acting on the skin by hot baths, dry cupping to the loins, and local depletion, if necessary. Stimulating diuretics—the physiological variety, such as squill, turpentine, bucku; and the chemical,—the alkalies—are contra-indicated; the former, as we have already seen, because they stimulate *in transitu*, and the latter, not because, as Dr Meryon would have us to understand, they in like manner stimulate the motor fibres of the renal plexus, but because they present to the kidney an augmentation of its normal stimulus, in the form of urea, and thus impose upon it additional work. Diluent drinks may be administered, and the bowels should be acted freely upon. Rest in one position, as lying upon the back, I should consider not proper. Static congestion would be thus encouraged.

The treatment of inflammation of the kidney must be conducted on the same principles as those which regulate that of all other inflammatory affections; the indications being to allay irritation, relieve tension, and stimulate absorption. Should the presence of any foreign body in the kidney be suspected, as the *origo mali*, measures for its removal should be adopted, as in the treatment of renal calculi. Tension of the

blood is at fault, and that the albumen which transudes in such cases is a modification of what circulates in the blood in the state of health. This may, doubtless, be the correct view of cases of temporary albuminaria; but the persistent presence of albumen in the urine, as in Bright's disease, is undoubtedly due to structural disorganisation of the kidney, interfering with the physical laws which regulate the separation of urine. Primarily, Bright's disease is, no doubt, due to some abnormal state of the blood, and very probably bears the same relation that cirrhosis does to blood contamination.

arterial system may be relieved by bleeding from the arm, a remedy which, for this purpose, if judiciously employed, in efficacy yields to none. Should the patient be plethoric, and have much fever, phlebotomy is particularly to be recommended. Warm baths, emollient applications to the loins, and soothing enemata are peculiarly grateful. Cupping in the lumbar region may be employed; and small doses of calomel and opium given, frequently repeated.

In nephritis the administration of digitalis is particularly indicated, not because of a specific action upon the kidney, but that because in such cases epithelial cells accumulate in the *tubuli uriniferi*, occasioning, by obstruction, congestion of the tubular capillary system, which this agent, by its stimulating action on the heart, overcomes.

Of the different varieties of renal disease which come under the general term *morbis Brightii*, it does not come within the scope of our remarks to treat; more particularly, as they do not throw further light on the phenomena of suppression than those we have been considering, the immediate cause of the suppression and effusion being obstruction to the renal circulation, and retention of crystalloids in the blood. Detailed reference to those conditions will be found in special works.

In the foregoing, as in my pamphlet "On Therapeutics and Disease," it has been my endeavour to deduce general principles from such undoubted facts as are in our possession, few though they be.

It is a mistake to suppose that generalisation arrests investigation,—it rather circumscribes our labours, and indicates the direction of research. Or in the words of

Dr Brown : " It is the right use of hypothesis ; not to supersede, but to direct investigation,—not as telling us what we are to believe, but as pointing out to us what we are to ascertain." It is thus that we must endeavour to separate accidental connections from necessary conjunctions, and establish those laws which regulate the various functions of our bodies, and which rest on the universal experience of mankind.

Thus we have submitted acknowledged facts, and deduced therefrom what we contend to be logical inferences. The facts; that in health the various excretions of the body are formed from the oxidation of effete tissue, and that the adequate performance of this, the histolytic, as well as the converse, the histogenetic function of the living body, constitutes healthy existence ; that health is represented by an unvarying composition of the various excreta ; that certain of the excretions are formed from the nitrogenous elements of the body, viz., urea, carbonic acid, and ammonia ; that these excretions are not formed directly by oxidation from the nitrogenous compounds, but by a series of chemical evolutions ; that in health the intermediate products are fully oxidised in order to present to the emunctories their natural stimuli ; that if the conversion is arrested, or, from causes to which we have referred, rendered incomplete, intermediate compounds are the result ; that these constitute the *materies morbi* of several diseases ; the inferences ; *that it is predicablè of these diseases in common that their materies morbi is the result of deficient oxidation, and that their rational treatment consists in furthering the perfect metamorphosis of such compounds.* But this, it is true, does not absolutely explain *why* oxalic acid is formed in one

instance, uric acid in another, sugar in a third, and so on ; but admitting the premises and the conclusion, a substantial hypothesis, using the term in its literal signification, is furnished, from which further research must tend.

The endeavour to unravel the etiology of many diseases by pathological anatomy, is in too many instances nothing short of an absurdity. It is like a man sawing off the branch of a tree while sitting on the outside of the instrument. We can never know what is disease until we possess a rational appreciation of the condition of health. Disease is a relative condition, and the question presented for our investigation is, What is its relation to health, and how can these aberrant changes be prevented or arrested ? These views, and those I have elsewhere advanced on this subject, I submit, fulfil the requirements of a sound theory. There is first, the cause ; secondly, the phenomena of the several diseases cannot otherwise be explained ; and thirdly, the empirical treatment of the diseases in question admits, according to our theory, of rational explanation.

No doubt the reduction of medical science, so-called, to general principles has its disadvantages. It tends to prevent, for instance, the unbridled evolution of the luxuriant imagination, to which *alone* so many practitioners of medicine are indebted for success.

What *is* medical science ? A few—a very few—ultimate facts : a chaos of isolated assertions and contradictions, innocent of the parentage of reason, but greedily accepted, according to the law of supply and demand, by a gullible public : ideas selected from the confusion of untutored brains (for that is of no matter,

or rather, it is an advantage), as fancy and the purpose to be subserved determine: a system of introducing into human bodies heterogeneous compounds and mixtures of which little, to affect changes of which less, is known; removing substances when they are believed to exist in the blood coincident with particular symptoms, and introducing them when they do not—a conflict in which nature often conquers!

Like the schoolboy, running with his heart in his throat over the treacherous quagmire, the modern physician is unable to find a firm footing in the medicine of latter days; and his dalliance with remedial (?) applications, and endless experiments on frail humanity are comparable simply to the relations which subsist between the “fast” young man and his tailor, or the “girl of the period” and her accommodating milliner.

But medicine *does* present a field for scientific investigation—a scope for genius. What is the chemical compound, for assuredly it is one, and not an organised creature, which causes typhus fever or cholera? How are the ravages of those fell diseases to be stayed, that the allotted span of human life may become more general, and the tyrant Death demand the immolation of fewer of those who launch on “the divine calling” dazzled with the tinselled hopes of youth?

Who will arrest the significant hectic which feeds on the gradual wreck of that fair form, whose holy worship fanned the maiden’s pride, and which insidious disease now tapers to the grave? Who will isolate these morbid agencies, or, better still, teach us how their generation may be arrested, or entirely prevented?

Yes ! there *is* such a thing as *medical science*, but there is likewise such a thing as *medical trade* ; the few devotees of the former occupy the garrets of the profession ; the many of the latter rollick away useless lives in affluence and luxuriance !

Quackery abounds !

CHAPTER II.

RETENTION OF URINE: ITS VARIETIES, CAUSES, AND
TREATMENT.

Strictly speaking, the urinary canal may be said to extend from the pelvis of the kidney to the *meatus urinarius* of the penis; the bladder being simply a reservoir conveniently situated, and admirably adapted, from the perfection of its mechanism, to meet the varied exigencies of our state.

The passage of urine from the kidney to the bladder is a purely involuntary act; its expulsion from the bladder a reflex act, which may be performed independently of the will, but over which volition has to a considerable degree a regulating and controlling influence. Between the purely organic or involuntary and the purely voluntary actions of the body, that of micturition consequently occupies a middle position. These facts, therefore, imply the existence of a muscular mechanism, partly independent and partly dependent on the cerebro-spinal system. Hence, in common with the other portions of the ureter, the pelvis and the greater portion of the calyces consist of three coats,—externally, a strong fibro-areolar one, which becomes continuous at the bases of the papillæ with the portion of the proper coat of the kidney, which is continued inwards to the sinus; intermediately, a strong muscular coat, consisting, as all canals in the body having like

functions to perform, of longitudinal and circular fibres; and internally, a thin mucous coat, which is reflected over the summit of each papilla. The function of the ureter being beyond the control of the will, its nerves are derived exclusively from the inferior mesenteric, spermatic, and hypogastric plexuses of the sympathetic. The bladder, in like manner, is composed of three coats,—outermost, a serous, partial in extent, and derived from the peritoneum; intermediately, a muscular; and innermost, a mucous coat. The muscular coat of the bladder, which more immediately regulates the expulsion and retention of urine, is composed of pale involuntary muscular fibres, in the anatomical sense of the description. These fibres are so arranged as to form three layers; the external fibres taking a longitudinal course, the intermediate being circularly arranged, and the third or innermost following the same course as the superficial layer. The longitudinal fibres are most apparent on the *anterior* and *posterior* aspects of the bladder. In front their commencement is traced to the surface of the prostate gland in the male, and a corresponding region of the vagina in the female; and from this they pass, on the one hand, over the anterior surface of the bladder towards its summit, and posteriorly, in like manner, towards the base of the viscus, on the lateral aspects of which they run obliquely, and not unfrequently intersect one another. From the part which these muscular fibres perform in the act of micturition, they are collectively termed the *detrusor urinæ* muscle. In the upper and back portion of the bladder, the middle or *circular* coat does not follow the regularity of arrangement which the term implies, for in this portion of the bladder the arrangement of

this part of the muscular coat is rather oblique than circular; but as the vesical orifice is approximated, the layers become more dense and more circular in disposition, and around the neck of the bladder constitute dense muscular fibres, termed the *sphincter vesicæ*, which, however, is not anatomically distinct from the common middle coat. The difference in the disposition of the fibres of the middle coat, in the regions mentioned, is an interesting anatomical fact, and has, no doubt, a physiological significance, to which reference will be made in the sequel.

The most deeply situated or sub-mucous coat, very delicate in structure, is scattered in a longitudinal manner throughout the cavity of the bladder, and, doubtless, co-operates with the external coat in the performance of a common function.

Between the mucous membrane of the bladder and the muscular coat, a layer of areolar tissue, termed the *cellular* or *vascular* coat, exists. The mucous coat is smooth, soft, and of a pale rose colour. In the undistended condition of the bladder it is arranged in folds, but becomes smooth or even in surface according to the degree of distension. At the orifice of the urethra it forms a small projection termed the *uvula vesicæ*. In a hypertrophied condition of the muscular coat of the bladder, in particular, two muscular bands may be seen converging from the orifices of the ureter towards the urethral orifice. At their point of convergence they cross each other, forming the deeper portion of *uvula vesicæ*, and then become continuous with the longitudinal muscular fibres of the urethra. It is their office to occlude the orifice of the ureters, and to open that of the urethra; and they are termed

the muscles of the ureters. *En passant*, it may be remarked that paralysis of these fibres, no doubt, contributes to several states of retention of urine.

The mucous coat of the bladder is covered with a stratified epithelium, in variety intermediate between the columnar and squamous. The vesical mucus is alkaline, and is said to contain alkaline and earthy phosphates.

Partaking of an intermediate nature between voluntary and involuntary muscular fibre, the nerves of the bladder are derived, consequently, both from the sympathetic and cerebro-spinal system,—the former from the hypogastric plexus, and the latter from the sacral plexus. It is interesting and instructive, in a pathological point of view, to notice, that the sympathetic is distributed to the upper part of the bladder, and the spinal nerves more particularly to the neck and base. Through the visceral branch of the fourth sacral nerve, a connection between the cerebro-spinal nerves of the bladder and prostate is established with the sympathetic, by the junction of the former with the hypogastric plexus; and by means of the muscular branch of the same nerve, distributed to the levator ani and coccygeus, intimate pathological connections between the bladder, the rectum, and adjacent textures are well known to exist.

With reference to the nervous distribution of the bladder, Budge, of Griefswald, has recently performed some very interesting experiments on dogs, from which the following conclusions have been drawn:—The tracing of the vesical nerves from their origin to their peripheræ being, at present, impracticable, Budge resorted to faradisation of the nervous centres to determine the

relative interdependence between the bladder and the brain and spinal cord. By faradising the central hemispheres, the corpora striata, and the thalami optici, no effect was produced upon the bladder; but no sooner were the electrodes made to touch the pedunculus cerebri and the restiforme body, than the bladder contracted, and urine was voided. It was thus made manifest that this portion of the cerebro-spinal centre furnishes its motor power to the bladder. In order further to determine the medium of communication, the sympathetic and pneumogastric were divided, but without producing any modification of the manifestations previously observed; but *after section* of the cord, faradisation had no effect. It was further demonstrated that the vesical motor fibres proceeded from the pedunculus and restiforme body, through the anterior columns of the cord, to the anterior roots of the third and fourth sacral nerves, and that their function may be excited through the cerebrum, and by means of reflex action conveyed through the posterior roots of the sacral nerves. Further, it is alleged that there is another nervous centre for the bladder in the lower part of the lumbar region, from which, through the hypogastric plexus, motor fibres are sent to the bladder; and we are assured that excitability persists in this region longer, after death, than in any other portion of the nervous system exercising any control over the bladder. The centripetal nerves of this region are the sensory nerves which run in the posterior roots of the third, fourth, and fifth sacral nerves.

Before adverting to the conclusions which Budge and his followers draw from these facts, it is important to note to what extent the result of these experiments

accord with what is known of the relative functions of the sympathetic, sensory, and motor portions of the nervous system, and as this subject bears equally upon the phenomena of retention, and upon other questions to be discussed in subsequent sections of our undertaking, a review of them here may obviate unnecessary recapitulation.

An examination of the sympathetic ganglia discloses a connection with motor and sensory nerves. With the spinal cord each ganglion is connected by means of (*a*) white nerve fibres proceeding from the spinal cord to the ganglia, and (*b*) grey nuclear fibres (fibres of Remak) proceeding from the ganglion to the cord; and it may be incidentally remarked that the opinion is generally entertained by physiologists that every ganglion possesses in itself the properties of a nervous centre, being capable of originating, transmitting, and regulating impressions on the structures to which its branches are distributed.*

In the hypogastric plexus these communications abound, the lumbar ganglia having each two communicating branches from the spinal nerves. At the lower end the hypogastric plexus divides into two parts, one on each side of the pelvic viscera (pelvic plexuses), from which numerous branches are sent to the rectum, bladder, vas deferens, vesiculæ seminales, prostate, and cavernous portion of the penis, in the male, and the ovary, vagina, and uterus in the female.

Seeing that so little exists, without manifest design, in the very perfect mechanism of the human body, the fact of this intimate connection of the sympathetic with

* *Vide* Dr Andrew Buchanan's pamphlet "On the Classification of the Functions of the Human Body."

the cerebro-spinal system has naturally led physiologists to infer that peculiar properties were developed by this interchange of nerve fibres, and to Claude Bernard, to whom scientific medicine and physiology owe so much, is due the credit of advancing our knowledge on this abstruse question, as well as on so many kindred subjects. It has been long known that the nervous supply of the vascular system is derived from the sympathetic, and we have already seen the effect produced by the withdrawal of the influence of this portion of the nervous system from minute blood vessels. In addition to such experiments of Bernard's as we have already adverted to, he found that division of the sympathetic in the upper part of the dorsal region in the horse was followed, as in the experiment on the rabbit, by greatly increased vascularity, and that the corresponding surface was bathed in perspiration.

By far the most important experiment, however, with which we are acquainted, as elucidating the respective properties of the three portions of the nervous system, is the following one, likewise performed first by Bernard,* and which Dr Meryon informs me he has also performed with similar results. Bernard exposed in a dog the gustatory nerve, the chordæ tympani (before they receive communicating branches from the lingual nerve), and the submaxillary ganglion. By this means a motor nerve (the chorda tympani), a sensory nerve (the lingual), and a ganglionic centre were exposed to view. Thereupon he divided the gustatory nerve before its junction with the tympanic nerve, and immediately the secretion from the gland was arrested, because, as Dr Meryon believes, the vital sense of the

* Comptes Rendus, vol. xxxiv. p. 474.

gland was destroyed. He then pricked the centripetal end of the divided nerve, and a large quantity of saliva was secreted, while the ducts of the parotid and sublingual remained dry. The experiment was subsequently varied by section of the common nerve, the insertion of a tube into the Whartonian duct, and by a weak current being communicated to the peripheric end of the divided nerve. Whenever this was done, a drop of saliva was seen to fall from the tube. Thus secretion was arrested by division of the gustatory, and reproduced by pinching its centripetal end. It was arrested by division of the compound nerve, but likewise restored by the stimulus of electricity applied to the centrifugal end—when applied to the centripetal end of the divided nerve no effect was produced. As the sensory nerve is centripetal in function, it could not affect secretion except by reflex action through the motor; it is obvious, therefore, that it is upon the motor nerve that the supply of blood for increased secretion depends.*

I have always entertained the belief that the function of an organ is maintained in its normal state by a certain potential equilibrium or correlation of the various nerves by which it is supplied. Thus impressions upon the sympathetic (fibres of Remak), which correspondingly diminish its inhibitory power, exalt motor influence, by accelerating the circulation; of which examples are furnished in the increased force and frequency of the heart's action, caused by mental impressions, and augmented glandular secretion, likewise occasioned by mental impressions, if not originating in, being at least directed towards particular parts of the ganglionic system. This disturbance of the nutritive balance is

* *Vide* Dr Meryon's excellent lectures in the "Lancet," vol. ii. 1871.

the psychical; while Bernard's experiments just referred to demonstrate how somatic influences (reflex irritation, &c.) upon the sensory nerves may be productive of like results.

Reverting, after this apparent digression, to Budge's experiments, we are solicited to disbelieve—not for the first time, however—in the existence of a special* *sphincter vesicæ*, on the following grounds:—

“Faradisation† of any portion of the bladder caused urine to be voided; and when Budge caused a column of water to flow in an uninterrupted stream out of the bladder, faradisation of the anatomical sphincter had no influence in arresting the flow. This was, however, immediately checked when the electrodes were directed to the membranous portion of the urethra, acting upon the constrictor urethræ and bulbo-cavernosus muscles,” which, it is contended, performed the part of sphincter to the bladder. Now, it must be urged that this experiment is insufficient to overthrow the opinions first enunciated, we believe, by Sir Charles Bell, and accepted by so many competent observers after him. It is, indeed, at variance with experience, and opposed to what we believe to be the normal physiological functions of adjacent organs. In the first

* For the information of recent writers, who seem to think that Budge's views regarding the circular fibres in the neck of the bladder are novel, it may be mentioned that some years ago, Dr Decimus Hodgson, of Glasgow, published a small volume “On the Prostate Gland, and its Enlargement in Old Age,” in which the following passage occurs. In treating of “healthy micturition,” Dr Hodgson remarks, “that the prostatic urethra and the neck of the bladder, with the neck of the canal, are kept closed during the intervals of micturition by means of the elastic tissue in their walls, quite in the same manner as the bladder is kept in apposition with its contained urine; and that the muscular fibres of the bladder and the urethra are simply employed in expelling the urine at intervals.”

† Dr Althaus, Brit. Med. Journal, 1871.

place, this experiment simply demonstrates, looking at the question from an anatomical point of view, what would, *prima facie*, be expected from their size, that the constrictor urethræ and bulbo-cavernosus muscles are endowed with more potent muscular contractibility, on the one hand, than the *detrusor urinæ* muscle, and, on the other, than the comparatively slender portion of the middle coat which constitutes the anatomical sphincter. This view (that of Budge) is further negatived by the facts, that in operations which involve the cutting of these muscles, incontinence of urine does not necessarily follow, that neither the bulbo-cavernosus nor the constrictor urethræ passes sufficiently far back to prevent the presence of urine in the prostatic portion of the urethra—an occurrence, it need hardly be remarked, at variance with the most moderate experience of the use of the catheter. Moreover, it is the special action of these muscles to evacuate fluid lodged in the canal (hence the bulbo-cavernosus muscle is termed the accelerator urinæ, vel ejaculator seminis), and to increase the turgescence of the penis during erection; and it is impossible to conceive how seminal fluid could be ejaculated by means of the bulbo-cavernosus without its admixture with urine—a contingency which would undoubtedly destroy its fecundating property, and which, in short, never occurs in the normal state of the parts.

Like the ureter and bladder, the urethra consists of a mucous membrane, beneath which muscular fibres, disposed longitudinally and circularly, exist. The mucous membrane of the urethra is thin and delicate, continuous posteriorly with the mucous membrane of the bladder, and anteriorly with the investing membrane of the glans penis and skin. Of its muscular

fibres the internal is that portion which is longitudinally arranged, and it is derived from the deep muscular layer of the bladder. The nerves of the urethra are numerous, and are derived from the pudic nerve, sacral plexus, and hypogastric plexus.

Viewed, therefore, as a muscular tube, with an intermediate *reservoir*, abundantly supplied with nerves, and of a somewhat complicated mechanism, it will be obvious that obstructions to the flow of urine in the urinary canal are resolvable into, 1st,—such as are physiological; 2d, such as are pathological; and 3d, such as are mechanical. These conditions may be thus tabulated:—

(a) *Physiological Retention of Urine.*

Spasm.

Of ureter. Of bladder.
From mental emotion.

(b) *Pathological Retention of Urine.*

Paralysis.

Permanent.

Transient.

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| (a) From Affections of the head. | (a) From Affections of the head. |
| (b) " " of the cord. | (b) " " of the cord. |
| | " Old age. |
| | " Over-distension of the bladder. |
| | " Reflex irritation. |

Retention from Vesical inflammation.

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| " | " | Strangulated hernia. |
| " | " | Hernia of the bladder. |
| " | " | Prolapsus. |
| " | " | Vesical tumours. |
| " | " | certain uterine conditions comprising— |
| | (a) | Retained menses. |
| | (b) | Pressure of impregnated uterus. |
| " | " | Pressure from conditions of the rectum. |
| " | " | Traumatic hæmorrhage into the bladder. |
| " | " | Rupture of the bladder. |

Retention from Shock.

| | | |
|---|---|---|
| " | " | Inflammation of the urethra (a) specific. |
| " | " | " " " (b) non-specific. |
| " | " | Laceration of the urethra. |
| " | " | Tumours in the scrotum, penis, perinæum. |
| " | " | Enlarged prostate. |
| " | " | Diseased prostate. |
| " | " | Permanent or organic stricture. |
| " | " | Spasmodic stricture. |
| " | " | Phimosis, and other abnormal conditions of the prepuce. |

 (c) *Mechanical Retention.*

Stone in the urinary passages.

PHYSIOLOGICAL RETENTION.—*Spasm*—The possible existence of spasm of the ureter, and retention of urine arising therefrom, is based upon the fact, that the ureters manifest contractility on the application of stimuli; that pain, accompanied with the symptoms of obstruction, is referred to this region; and that these are capable of removal by narcotics and antispasmodics. I believe there is no such thing, strictly speaking, as idiopathic spasm; some exciting cause must be invariably present. But even as spasm of the bowels and other involuntary muscles, such as the diaphragm, takes place under particular circumstances, there is no apparent reason why spasm of the ureter should not likewise occur under analogous conditions; and it is assuredly within the range of possibility, that spasm of the ureter may at least contribute towards the condition of retention. As has been indicated, warm baths, narcotics, and antispasmodics should afford the best results in the treatment of this condition.

Accumulation of flatus in the bowels, by pressing upon the ureter, has been assigned a place in the etiology of retention; but this alleged cause is less worthy of serious consideration than the foregoing.

Spasm of the bladder is of occasional occurrence, and the contraction of the organ may take place to such a degree as to effect complete closure of the orifices of the ureters, and thus give rise to a species of retention, whereby the urine is retained in the ureters and pelvis of the kidney, with such effect, as we have already seen in treating of suppression, due to pressure from without.

This affection is characterised by the following symptoms:—The bladder is contracted into a hard ball; intense pain is complained of, extending to the penis, sometimes causing erection of the organ, and to the bowel, occasioning painful tenesmus. In the lumbar region, the symptoms are those of calculous nephralgia—cold perspirations, paleness of surface, weak and frequent pulse, and general irritability. From cystitis it is to be distinguished by the history of the case, presenting, as it does, the feature of suddenness of attack, absence of fever, absence of pain on pressure; (this causing, as in colic, rather relief,) by the paroxysmal nature of the pain, and the previously normal condition of the urine. Independently of idiopathic spasm of the bladder, traumatic spasm may be due to stone, morbid conditions of the urine, morbid secretions from the bladder itself in certain diseased states, irritating diuretics, such as turpentine and cantharides, and sympathetic irritation from gout, hysteria, cold, and injuries of the rectum.

Treatment.—The treatment of spasm of the bladder must be regulated according to the presumed cause. If due to foreign bodies, fissured anus, or other forms of peripheral irritation, these conditions will necessitate attention. Idiopathic spasm will demand atten-

tion to the state of the urine, and, if necessary, in addition to the administration of such agents as chloral, hyoscyamus, and camphor, the exhibition of alkalies. Antispasmodics, from which there is a sufficient variety to select, are indicated; and if the case be sufficiently urgent, the inhalation of chloroform or ether may be resorted to. Diseased conditions of the mucous membrane of the bladder, when diagnosed, must be treated according to the particular indications which each case presents.

Retention from mental emotion is a manifestation of urinary disorder occasionally met with, though it is of such a nature as not to have merited attention in medical works. It is well, however, that its existence should be recognised, as it may lapse into the variety of vesical paralysis due to over-distension of the bladder. It is usually, indeed almost invariably, met with in persons of a highly nervous temperament, happening to be placed in circumstances where a feeling of shame, or other mental emotion, is such that the co-ordination of nervous power between the sympathetic and motor nerves is disturbed to such a degree as to occasion temporary paralysis. Usually this state passes away rapidly; it is analogous to what occurs in very sensitive people losing to such an extent the power of the muscles of the fore-arm, as in writing in presence of on-lookers, or other unusual circumstances. If it remain so long that the bladder becomes too full, catheterism may be required.

RETENTION FROM VESICAL PARALYSIS.

The performance of its normal function by the

bladder depends on the four following conditions :—
1st, A normal reciprocal action between the motor nerves of the viscus and the brain ; 2d, a healthy condition of the sensory nerves ; 3dly, a perfect potential co-ordination between the three sets of nerves supplied to the bladder—the motor, the sensory, and the sympathetic ; and 4thly, an unimpaired state of the muscular fibres of the bladder.

Of the first variety, familiar instances are furnished in typhus and other fevers, where possibly, from temporary congestion, aberrant impressions are made upon the pedunculus and the restiforme body ; in cases of paraplegia from organic disease of the nervous centres, and in other instances where the nerves themselves are unfitted, from structural derangement, for the transmission of motor power to the muscular fibres. Violent twists of the spinal cord, blows, and shocks, may cause, in like manner, retention, more or less permanent, as the cause is aggravated. Effusion into the ventricles of the brain is sometimes characterised by like consequences.

Retention and incontinence occur at times apparently in a very capricious manner ; but we think the anomaly is capable of explanation by a consideration of the physiological facts already submitted.

We accept the fact that section of the cord above the sacral plexus invariably sets up ischuria and dilatation of the bladder, but never incontinence ; for, in the first place, the motor influence of the vesical nerves is at once completely withdrawn, by their connection with the brain being thus severed. It must be assumed in this case that motor paralysis of the entire muscular structure of the bladder is induced, the *cir-*

cular as well as the *longitudinal*, and why should retention exist? From the fact of the ischuria, which admits of a sufficiently palpable explanation, and the absence of incontinence, it is inferred, by Budge and his disciples, that there is an increased reflex irritability, according to which assumption there is established a heightened reflex tone of the urethral muscles, whereby the retention is occasioned. But supposing it be admitted *causa argumenti* that an increased reflex excitation is thus induced, of what can it avail *when the motor power of the nerve supplying the urethral muscles (the pudic) must be destroyed by section of the cord, as well as that of the vesical nerves?* The pudic is a branch of the sacral plexus; and if the motor power of this plexus be destroyed by section of the cord in respect of the vesical muscular fibres, it is somewhat difficult to conceive how the same thing should not occur with respect to the urethral muscles. But incontinence does set in as a secondary event; and to reconcile this unfortunate occurrence with the fragile theory at issue, we are informed that the event is due to hydrostatic pressure. Thus hydrostatic pressure, from accumulation of urine in a bladder deprived of motor power, overcomes the power of muscles of no insignificant proportions, whose potency is augmented by reflex excitation! It is a somewhat unfortunate circumstance for not a few patients and surgeons, that canine and human bladders present very diverse phenomena. An explanation more in accordance with physiology is desiderated, and the following is confidently suggested:—In a distended condition, the prostatic portion of the urethra is the most spacious portion of the canal, but except,

during the act of micturition, it is closed by means of the action of its muscular fibres. This object is achieved, as in the case of the proper sphincters, by means of the sympathetic. If the cord be divided above the sacral plexus, motor power will certainly be withdrawn from the muscular fibres of the entire bladder; but the prostatic and the urethral branches of the hypogastric are so intimately connected with the aortic and solar plexuses, that section of the cord *in this region* will not necessarily interfere with their function. But the influence which the sympathetic thus exercises over the urethra is necessarily not potent; and it is perfectly intelligible that hydrostatic pressure would overcome it, when it could not possibly have any such effect on the muscles alluded to, and under the circumstances quoted. That incontinence is occasioned in dogs after section of the *anterior roots* of the three sacral nerves, admits of an easy explanation, independently of Budge's theory; for we have seen that the motor fibres are largely supplied to the neck of the bladder, and the division of a limited number of the sacral nerves might cause paralysis of the sphincter; sensation, and the motor power of the *longitudinal fibres* remaining unimpaired.*

* Valentin has long ago demonstrated that irritation of the roots of the spinal nerves, and of the sympathetic, which contains the fibres of these, produced powerful peristaltic action of the ureter proceeding towards the bladder. Irritation of the inferior portion of the abdominal sympathetic excited strong contractions of the bladder; this effect was occasioned more particularly by irritating the sacral portions of the sympathetic. The same result was produced by irritation of the roots of the middle and inferior abdominal nerves of the spine, *but no effect was produced unless the portion of the sympathetic distributed to the particular part was entire*. Contractions of the vas deferens and vesiculæ seminales were likewise produced by irritation of the inferior lumbar and highest sacral portions of the sympathetic; and in like manner, contractions of the fallopian tubes and of the uterus, from the fundus to the

This view of the influence of the sympathetic affords a rational explanation, besides, of certain other phenomena attendant on spinal injuries which would be otherwise perplexing.

According to the particular region of the cord injured, certain affections of the genito-urinary system are developed.

In cases of injury of the lower portion of the spinal cord, proportionate to the severity, paralysis more or less complete of the sphincter and detrusor fibres ensues, and the urine accumulates in the viscus according to gravitation, as the position of the body permits, and overflows therefrom by hydrostatic pressure. Intestinal paralysis is in like manner induced, and as a consequence, troublesome constipation. Should the injury exist, however, in any part of the dorsal region above the tenth vertebra, priapism is a frequent manifestation of the disorder. Associated with this peculiar feature, the temperature of the body below the seat of injury is markedly increased, and as a matter of course paraplegia, more or less complete, is invariably present. Further, it must be noted that as a symptom

neck, may be excited by irritation of the same nerves as those which excite the rectum, viz., the lower lumbar and first sacral nerves of the spine. From his experiments Valentin drew the following inferences:—1. That all parts which exhibit involuntary movement are excited to action, like voluntary muscles, by stimuli applied to the nerves with which they are endowed. 2. That from whatever part of the sympathetic system their nerves arise their actions are governed by the same laws. 3. That the sympathetic system has the following relations with other nerves:—(a) its motor fibres are distributed to remoter parts of the body; (b) still throughout their long course there is no connection between them, so that definite contractions are excited according to the fibres irritated, as in other nerves; (c) that these motor fibres originally proceed from the cerebro-spinal system, and that irritation of their origins acts through the sympathetic trunks.—(*Valentin on the Functions of the Cerebral Nerves and the Sympathetic.*)

of spinal injury, priapism does not occur when the cord is injured in the cervical region, or from affections of the cerebro-spinal axis. It is the function, as we have seen, of the sympathetic system to regulate nutrition and exercise an inhibitory influence over the blood-vessels; let this influence be withdrawn, and increased vascularity and consequent elevation of temperature result, as Bernard's experiments and others of a similar kind so amply demonstrate. Priapism is as much an indication of debility as palpitation of the heart, and, as we have seen, it is never associated with injuries of the lower portion of the spine, though there be vesical paralysis, because that the sympathetic is independent of its relations with the cord in this region; and the explanation of its occurrence in the region of the spinal cord which we have indicated appears to be the following. Notwithstanding the connection of the sympathetic with the cord in the lumbar and sacral regions, injury of this portion of the spine does not effect it owing to its intimate, or rather, preponderating connection with the aortic and solar plexuses; but occurring in any part of the cord from the fifth to the tenth dorsal vertebræ inclusive, the abdominal portion of the sympathetic is severed entirely from the influence of the cord, by the impression on the greater and lesser splanchnic nerves. From the other branches of the sympathetic it is significant to note that the splanchnic nerves are contradistinguished by their whiteness and general firmness, owing to the preponderance of spinal nerves in their sheaths; and consequently, no doubt, to their possession of a more intimate physiological connection with the cord than any other of the abdominal branches of the same system.

There is every reason to infer that it is from this region that the vaso-motor nerves of the penis originate. In this case, therefore, the inhibitory influence of the sympathetic is removed from the blood-vessels of the penis, the heart continues to beat with unabated vigour, and blood is pumped into the cellular structure of the organ, occasioning enlargement simply by mechanical dilatation. Should the spinal injury be still higher paralytic myosis is of not uncommon occurrence.

It is probable, therefore, that in cases of paralytic retention the sympathetic is more immediately concerned than usually supposed to be, and that the apparently capricious occurrence of retention and incontinence thus admit of intelligible explanation.

The inability to pass urine is only absolutely complete when there exists paralysis of the abdominal muscles, for as long as they admit of being exerted the urine can be forced out in a slow current, though in small quantities. In complete paralysis of the bladder contraction of the viscus does not occur though the urine be entirely withdrawn, and in these cases inasmuch as there is sensorial as well as motor paralysis, the accumulation of urine causes no pain, and the attention of the surgeon is not unfrequently directed to this state by the supposition of an abdominal tumour, dropsy, or presumed incontinence of urine.

Paralysis due to affections of the brain and spinal cord are unmistakably recognised by the antecedent history of the case; such as injury from indirect violence, or the gradual development of cerebral and spinal symptoms characteristic of organic lesions; under all circumstances a careful examination of the abdomen should be instituted. Reflex irritation, as

in the case quoted (H. N., p. 49), may undoubtedly occasion disease of the nerves; and sometimes morbid processes seem to originate in the membranes of cord and bony canal. In his "Observations in Surgery and Morbid Anatomy," Mr Howship narrates a case 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; and this condition he found in one instance associated with other effects of progressive paralysis, due to disease of the joint between the atlas and odontoid. The capsule of the joint was exceedingly thickened, and the process, therefore, forced backwards, inducing a fatal compression of the spinal marrow.

Treatment.—Paralysis of the bladder when due to affections of the head or spine must be treated according to the indications presented by the supposed cause.

As to the propriety of catheterism, upon this as upon every other question which engages the attention of sublunary intelligence, opinion conflicts. Thus, Mr Jonathan Hutchinson observes, "There is, I think, room for much doubt as to whether the usual practice of relieving the bladder by the catheter is judicious. In a few cases, where the fracture is in a certain part of the lumbar region, the bladder is involved in hyperæsthesia, and the pain caused by its detention necessitates interference. These, however, are very rare, and, in almost all cases, the bladder fills without causing any discomfort, and when full runs over.

"After a few days it regains a certain amount of tone and empties itself very frequently. At this stage we have troublesome incontinence, and but little retention. Now, if the catheter be used from the first,

inflammation of the urethra and bladder is, I think, almost certain to occur, and the urine will become loaded with pus and mucus. I suspect that cystitis is, in some cases, one of the influences which brings about the patient's death by exhaustion. Not unfrequently ulcerations of the mucous membrane of the bladder occur. There is a specimen in the museum from a fractured spine case, in which a fistula passes from the membranous urethra into the rectum, no doubt in connection with the use of catheters. Why should cystitis thus constantly follow the use of catheters? Seeing that there is no impediment to the introduction of instruments, that they give the patient no pain and are used with the greatest ease, why should they produce so much more irritation than we usually observe when they are employed for other reasons. I think we must admit that it is probable that the mucous membrane of the bladder when paralysed, is in a state especially prone to inflame, just as the eye is after paralysis of the fifth nerve. The practical question before us is, whether to permit the retention to continue until overflow takes place is less likely to cause this cystitis than the use of instruments. My own experience has been in favour of non-interference, and I quite intend in the future to make a full trial of the plan."

Upon Mr Hutchinson's views, the following remarks may be made, and against his theory some weighty objections may be urged:—

In cases of paraplegia there is an undoubted depression of vital function, and, consequently, a remarkable proneness to the occurrence of bed sores. When the influence of the sympathetic is removed from the

blood-vessels, as we have seen, two factors of the inflammatory process, viz., increased vascularity and elevation of temperature, are immediately induced. Hence, from the vascular debility, prominent parts of the body, which would in health resist a certain pressure, break down under the conditions of paraplegia; and further, it is perfectly conceivable that the tissues in this state are less tolerant of irritation than in a healthy condition; but given two causes of irritation, it is expedient to eliminate the one from which the most danger is likely to result. I cannot help thinking, basing my opinion confessedly on a much more limited experience than that of the author quoted, that the tendency to cystitis in this state is somewhat over-rated. In cases of paraplegia, it must be borne in mind that urine retained in the bladder is particularly liable to decomposition, containing as it does so frequently an abundance of lithates, earthy phosphates, and other organic ingredients. This state of the urine is primarily due no doubt to the depressed state of the nervous system, and again to the condition of the bladder which favours decomposition; thus the two conditions mutually react on one another. If the bladder be not carefully emptied in these cases, experience amply testifies that decomposition of retained urine is very apt to induce structural disorganisation of the viscus. Supposing, then, Mr Hutchinson's treatment to be adopted, what is likely to happen? That only the supernatant fluid in the bladder, in all probability, will be voided, while the lower stratum of urine will remain indefinitely, and occasion those complications which it is so expedient to avoid. Moreover, Mr Hutchinson's treatment could only apply to certain

cases, for assuredly there are others where the power of micturition is completely lost. Further, muscular contractility is more apt to occur, beyond question, when the muscular fibres of the bladder are kept as much as possible in the condition of physiological rest, which it need hardly be mentioned, is not the distended state of the bladder. Indeed, such treatment, instead of predisposing to the restoration of muscular energy, is particularly apt to cause atony—a fact with which we are so familiar in the cases of debility of the detrusor fibres, which the occasional over-distension of the bladder so frequently induces.

Instead, therefore, of viewing this *laissez faire* treatment with favour, it is, in my opinion, to be strongly reprehended. Its risks and inconveniences are incomparably greater than the alleged complications ascribed to judicious catheterism. The bladder should, in cases of paraplegia, be never allowed to suffer great distension; and should there be any evidence of any affection of the mucous membrane as arising from decomposition of the urine, washing, by means of the double catheter, with a weak solution of permanganate of potash, or oxygenated water, is to be enjoined.

Of internal remedies, tincture of steel, strychnine, ergot of rye, and phosphorus, may be carefully administered; but should there exist decided evidences of organic lesion, the prospect of much benefit from these or any other means is very remote.

Should the vesical affection be presumably due to shock from direct violence to the cord, or to the cerebro-spinal system, and likely to be transient, the electro-magnetic current, as recommended by Sir Henry Thompson, promises good results. Sir Henry's

method of application is as follows:—"To one pole the ordinary handle and moist sponge are attached, which is placed over the lumbar vertebræ; an elastic bougie, containing a conducting wire, and tipped with metal, is attached to the other pole, and introduced into the bladder. A weak current is set agoing, and its effects watched. Thus, a slight sensation only is to be produced. Move the bougie about gently in contact with the walls of the bladder, the urine having just been withdrawn; and, finally, let it rest a little in the neck of the bladder, where greater discomfort is felt—in all allowing the current to pass for eight or ten minutes before withdrawing."

Dr Althaus, on the other hand, a gentleman who has given considerable attention to the subject of galvanism in its therapeutical relations, and is deservedly esteemed an authority, recommends a different method to that enjoined by Sir Henry Thompson. Dr Althaus remarks, "Experience has shown me that it is neither necessary nor expedient to apply the current directly to the tissue of the bladder itself, as we might do by means of an insulated sound, with a free metallic knob introduced into that organ. Direct galvanism of the *full* bladder is objectionable, because a powerful chemical decomposition of the urine is the consequence of such a proceeding, giving rise to symptoms of fainting, owing to the sudden distension of the viscus by the gases which are set free; while direct galvanism of the *empty* bladder appears to produce an irritating effect upon its mucous membrane. External galvanism produces none of these inconveniences, and is thoroughly effective, so that it should in all cases be employed in lieu of direct internal galvanism.

The position of the electrodes should vary according to the seat of the affection. Where we have reason to believe that it is due to disease involving the pedunculus cerebri, one director connected with the negative pole should be placed to the back of the head, and another connected with the positive pole above the os pubis. The latter electrode should have a large surface. In cases of disease of the lumbar portion of the spinal cord, the negative pole is placed to the lower part of the lumbar spine, and the positive in the same position as above. Finally, in local paralysis of the bladder, we may either use the same arrangement of the electrodes as in spinal disease, or both directors may be placed above the os pubis."

Dr Althaus further recommends that the current be intermittent rather than continuative, an application of from three to four minutes sufficing in respect of time.

RETENTION FROM OLD AGE.

Muscular paralysis occurs under the three following conditions. 1st, When centripetal impressions are incapable of transmission to the central nervous system in consequence of disorganisation or lesion of the sensory nerves, a condition to which the term anæsthesia (*α αἰσθησις*) is familiarly applied; 2dly, when motor or centrifugal impressions are similarly influenced, a state in contradistinction to the former indicated by the term acinesia (*α κίνησις*); and, 3dly, when the muscular fibres are themselves incompetent for the performance of their function from structural changes.

One of the most notable manifestations of the in-

sidious incursion of the phenomena of declining years, is that of vesical debility. This may occur in common with a general atony of the muscular structure of the body, without any apparent connection with, or dependence upon, affections of the nervous system, or it may be associated with them. We recognise the latter condition if due to cerebral affections by their characteristic mental alienations, and the manifestations of local paralysis. If associated with spinal affections impaired power of locomotion, diminished sensibility in the lower extremities; and the fact that while the bladder may be enormously distended the patient is unconscious of his condition, will tend to elucidate the diagnosis. Retention from paralysis is to be distinguished from retention from obstruction by the absence of the subjective symptom of pain, by the facility with which an instrument can be introduced into the bladder, and that when so introduced the urine flows from the viscus in a slow stream, just according to the degree of paralysis and the extent to which the abdominal muscles are capable of co-operating in the act of micturition. The power of expelling urine in the ordinary debility of old age is not usually lost. The patient simply finds that the act of micturition occupies a longer time, that a greater exertion is required in its performance, that the stream is less full, and that a feeling of imperfect evacuation is more or less experienced. Should a residuum of urine remain in the bladder, under these circumstances, as we have seen above, it is apt to become putrid, and consequently occasion inflammation of the bladder, and other complications.

According to the degree of muscular power, or to

the causes which occasion its impairment, so will be the efficacy of remedial agents, and other therapeutical appliances. If due to marked organic disease of the nervous centres, a condition almost invariably progressive, the prognosis must necessarily be unfavourable; if due to temporary over-distention, or to a transient impression on the nervous centres in an otherwise healthy subject, the case will present a more promising aspect. In treatment it is of primary importance that undue accumulation of urine be prevented, that all sources of irritation be removed, more particularly as occurring in the bladder itself, and that tone be imparted to its muscular fibres by the judicious selection of internal medicines; blistering to the region of the spine more presumably affected, or antiphlogistic measures if required in the early stages, and by the use of galvanism as referred to in the foregoing section.

We have seen that the bladder is abundantly supplied with nerves from each of the three divisions of the nervous system, each class subserving according to their distribution the performance of a special part in the act of micturition. That certain remedial agents act specifically upon the different nerves has been satisfactorily demonstrated; according, therefore, to the particular fibres of the bladder at fault the selection of remedies becomes a question of scientific precision. If there be paralysis of the detrusor fibres we employ tincture of steel, ergot of rye, strychnine, &c. (for though the sympathetic is distributed to the upper and back portion of the bladder, and regulates in all probability the action of the detrusor fibres, it contains motor branches derived from the spine). If there be hyperæsthesia of the detrusor fibres, as in enuresis, a condition due pre-

sumably to certain states of the sympathetic, chloral, belladonna, camphor, &c., are indicated. With respect to opium in small doses, it is to be remarked, that it is a motor excitant, an effect indicated in its acting as a cardiac stimulant, and may, therefore, be beneficially conjoined with pure genito-urinary stimulants.

It is in such cases that *Retention from over-distention* is most apt to occur, though it may take place in perfectly healthy individuals. Its causes are, primarily neglect to empty the viscus when desire exists; while exposure to cold predisposes to muscular debility in the aged, and in like manner inordinate indulgence in alcoholic liquors, which, in addition to stimulating the kidney to augmented secretion, superinduces the narcotic effects of alcohol on an already weakened organ. Catheterism will be demanded, in the first place, and then general treatment if the exigences of the case so demand. To this section also belongs certain cases of retention after childbirth, the pressure of the child's head in the pelvis obstructing the urinary canal in the mother, till accumulation of urine has taken place to such a degree as to occasion temporary paralysis; while others may be due to nerve compression, a fact indicated by the frequency with which pains extending down the thigh are complained of, when the head is engaged in the pelvis.

RETENTION FROM REFLEX IRRITATION.

We have seen that an intimate nervous intercommunication takes place between the nerves of the pelvic viscera, we have descanted upon the interesting fact that the motor nerves proper of the bladder are

chiefly distributed to the region of the sphincter vesicæ, and, accordingly, the pathological significance of reflex irritation in its bearings on retention will be obvious. In addition, therefore, to the irritation, and, possibly, to the mechanical obstruction to the passage of urine exercised by the presence of adventitious growths, irritation from certain conditions of the prepuce and rectum may occasion spasm of the sphincter, and consequent retention. If the irritation be of a mild description, as due to the presence of ascarides, &c., irritability of the bladder and enuresis are induced, but if of a more violent nature, as from operations on the prepuce and rectum, for the removal of hæmorrhoids, &c., retention from spasm is the result. A case of the latter description occurred recently in my practice. On the 29th November last, by the advice of a surgical friend, I operated on Mr O——, for external hæmorrhoids by means of the ligature—the pedunculated nature of the tumours and the patient's abhorrence of a cutting operation dictating this procedure. Nothing worthy of note occurred during the transfixing and tying of the tumours. On the evening of the same day considerable difficulty was experienced in voiding urine, an occurrence which the administration of a sedative draught containing opium and hyoscyamus to a great extent removed. On the 2d December, during an examination of the hæmorrhoids, with a view to ascertain the condition of the ligatures, a considerable amount of irritation was thereby caused. Subsequently, this local irritation became more intense, and occasioned a return of the retention. For fully two hours, as I was informed, patient could not pass urine, though making the greatest efforts to do so. The cause being clear,

the application of hot fomentations to the pained part, and the administration of opium and hyoscyamus remedied this condition. A short time afterwards the piles were removed by the scissors, and the retention did not recur. The treatment of this form of retention will obviously resolve itself into a recognition of the cause, and its removal according to the principles enunciated.

RETENTION FROM VESICAL INFLAMMATION.

Inflammation of the bladder is a disease of not unfrequent occurrence, and its claim to a place in the etiology of retention must be universally conceded. As a matter of common observation, it is admitted by authorities that when inflammation of the bladder is confined to the neck of the organ retention takes place; and incontinence when the body and base of the viscus are involved in the inflammatory process.

These observations accord with what has been stated regarding the localisation of the distribution of the vesical nerves, and the disposition of the muscular fibres. Occurring at the neck, spasm is induced through the motor nerves; at the base, irritability of the detrusor fibres through the sympathetic.

Idiopathic inflammation of the bladder is of rarer occurrence than the traumatic variety. When it does occur it usually extends throughout the entire organ, and involves its entire structure. It may be induced by exposure to cold, irritating diuretics, excessive indulgence in stimulants, perverted assimilation, or the extension, by continuity of surface, of inflammatory affections of the urethra. Traumatic inflammation of

the bladder usually arises from the injudicious use of instruments, blows, wounds, and the forcible introduction into the bladder, of irritating injections as employed in the treatment of gonorrhœa, &c. Inflammation of the bladder is characterised by the usual febrile symptoms. Of the constitutional symptoms a quick hard pulse, thirst and general irritability, are the most prominent. Of the local manifestations, acute pain, aggravated by pressure, extending to the loins, urethra, and testicles; frequent and painful micturition, and high-coloured urine mixed with mucous or streaks of blood, are the most striking and most constant.

When the inflammation is more particularly confined to the neck of the bladder, the locality of the pain, and the occurrence of retention demonstrate the nature of the affection,

The *treatment* of this painful disease must be prompt and energetic. Should evidences of partial retention exist, the catheter must be carefully introduced, and the bladder thoroughly emptied. Leeches should be applied to the hypogastrium, followed by the application of poultices, hot fomentations, &c. The exhibition of small doses of calomel and opium, frequently repeated, should be enjoined; and the painful tenesmus which so frequently extends to the rectum, will be best relieved by suppositories of morphia and belladonna. Acrid conditions of the urine should be obviated by the use of alkalies, and the free administration of diluents, with hyoscyamus, camphor, &c.

Desault recommended the injection of a decoction of linseed tea into the bladder; or instead, tepid solutions of morphia and belladonna might be employed with benefit.

The use of the catheter, and warm baths, are more particularly indicated when the inflammation is manifestly confined to the neck of the organ.

RETENTION FROM STRANGULATED HERNIA, AND PROLAPSUS
OF THE BLADDER.

Though of rare occurrence, it is worthy of note that strangulated hernia may act as a cause of retention, by occasioning spasm of the sphincter vesicæ. Two cases of this description are narrated by Howship; the rarity of such cases, and the intrinsically interesting nature of the following one, which may be taken as typical of this variety of retention, are a sufficient apology for its quotation *verbatim*.

"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.

"*At noon*, I found the stomach had not rejected the medicine; but there had been no action of the bowels, nor any material alleviation of 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 nor sickness the part was not then examined.

"*At 3 P.M.*, I was told there had been a violent sickness at the 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 had been more severe than ever. He had with great straining and repeated efforts passed about a tablespoonful 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 had 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 the vomiting, that he 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. (Five days afterwards.) 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 following 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.

"Next day, found himself weak, but otherwise perfectly recovered."

This man, adds Mr Howship, fell ill a few months afterwards, and died from a totally different cause, and a *post mortem* examination disclosed nothing abnormal in the bladder, nor anything to explain the previous occurrence of spasm of the neck of the bladder.

Hernia and Prolapsus of the Bladder, must likewise be recognised as rare causes of retention of urine, and their discrimination from other tumours is imperatively desiderated, alike from consideration for the safety of the patient, and the reputation of the practitioner.

The bladder may be protruded in the usual situations,*

* Mr Lawrence is of opinion that hernia of the bladder is usually produced

of inguinal hernia, may be forced between the fibres of the abdominal muscles, or by being pressed before the head of the child in labour, may occasion one of the complications of the parturient state.

Of the first variety, Ruysch mentions the case of a patient of his who suffered from a great difficulty of micturition. He was unable to make urine, unless he raised his scrotum, and compressed it with his hands. It was found, after death, that there was a scrotal hernia of the bladder, accompanying which a portion of the ilium existed, which had become gangrenous.

M. Verdier mentions the case of a man suffering from the symptoms of stone, but in whom stone could neither be discovered by the passage of a bougie nor sound; but after death a stone was discovered in a portion of the bladder which had passed into the scrotum. A portion of small intestine, in this case likewise, accompanied the protruded bladder.

The same writer records the case of a peasant suffering from retention of urine, who had a swelling in the groin, with œdema of the surrounding parts. The swelling was opened by a country surgeon, who was naturally astonished on finding, instead of pus as he anticipated, that urine flowed from the wound. A similar case, presenting the appearance of a circumscribed tumour in the inguinal region, was believed to be a venereal bubo. Under that impression, emollient applications were applied. The surgeon growing dissatisfied with the tardy progress of the case, an incision was made into the tumour, when to his profound

when, in an ordinary hernia which has been neglected, the elongation of the sac gradually draws within the ring the portion of peritoneum attached to the bladder, and the bladder itself.

astonishment a stone dropped out. The urine continued to be voided through this wound, and left no room for doubt as to the nature of the swelling.*

Stalpart Vanderwiel also mentions the case of a tumour in a boy's groin similarly operated upon, when out dropped a calculus. The boy micturated a little by the penis, but during three subsequent years he also discharged urine by the opening in the groin.

In another case, "*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.*" A similar case, occurring in an aged person, has recently been mentioned to me by a medical friend. At present the wound in the groin is healed, and the patient is free from discomfort.

Of protrusion of the bladder in labour, the following instructive instance is recorded by Dr Merriman:—A poor woman was taken in labour with her first child, and sent for a midwife, who attended her for two days, but then fearing that something was wrong, she called in the assistance of a surgeon. Without instituting proper inquiries as to the state of his patient, the surgeon came to the hasty conclusion that he had to deal with a case of congenital hydrocephalus, and forthwith tapped what he conceived to be the enlarged head. The patient complained that he was cutting her, but he was not deterred from his purpose. Labour continuing, the child was expelled unmutilated, but dead.†

* *Mem. de l'Acad. Roy. de Chir. tom. iv.*

† Erichsen has seen the abdomen tapped in consequence of a distended bladder being mistaken for ovarian dropsy. I must confess that I myself, in consultation, and with the concurrence of another practitioner, performed

For more than a month afterwards, the poor woman continued in a state of extreme danger and suffering ; at the end of which time, a very large portion of the bladder sloughed away, and very slowly the patient was restored to health, being, however, incapable of retaining her urine.

The discrimination of such a complication of labour will be based on the locality of the swelling, its fluctuating feeling, the impediment to micturition, and the use of the catheter, whereby the tumour will be either partially or entirely removed.

Prolapsus of the bladder takes place into the vagina or perineum in the female. It is to be distinguished in like manner with the foregoing ; and the inconvenience which it occasions, may be to some extent obviated by the mechanical support of a suitable instrument introduced into the vagina.

VESICAL TUMOURS.

The bladder is occasionally the seat of adventitious growths in the form of tumours, which may give rise to mechanical obstruction, or cause spasm by reflex irritation, and thus occasion retention. Vesical tumours may be either simple or malignant ; more frequently

a similar operation for a supposed case of ascites, which turned out to be an *enormously* distended condition of the uterus from dropsy of the amnion. Patient was but in the *earliest* stages of pregnancy ; and the enlargement of the abdomen was such as seriously to interfere with respiration. I am aware that this operation is recommended by authorities in such cases, but I certainly performed it under an erroneous, I contend a pardonably erroneous, supposition. These cases sink into insignificance in comparison with that of the learned professor, who, after passing a catheter, and finding no urine flowed, at once punctured the bladder by the rectum, when it flashed across his mind that the case might be one of *suppression* !

they are of the latter variety. The former assume the form of small polypi, which are situated usually near the neck of the bladder. In some cases they become encrusted by the deposition of solid matter from the urine, to such a degree as to simulate the presence of urinary calculi.

Carcinoma of the bladder takes the form of fungous growths ; fibro-plastic tumours, with cartilaginous induration of the muscular layers, are occasionally met with ; also medullary cancer, usually situated between the coats of the bladder, and occurring in common with the deposition of cancer in adjacent organs ; but the most common variety of vesical cancer is the soft, furred, cauliflower-like variety, highly vascular, tender, and attached by a flattened peduncle.

This form of cancer either occurs isolated, or grouped together, finally coalescing into a large growth, and distending the bladder commensurately with the gradual hypertrophy of the viscus from the presence of the continued irritation. The disease may be confined to the neck, or to the fundus, or involve the whole extent of the bladder.

From stone, encrusted vesical tumours, if simple, are to be distinguished by their fixed position, conjoined possibly with the existence of a calculous diathesis ; if malignant, in addition to the foregoing, evidence of their nature will be furnished by the lancinating pain, the presence of blood in the urine, and possibly of debris containing cancer cells, and the constitutional manifestations of the cancerous cachexia. Altogether, the diagnosis is necessarily equivocal.

Treatment.—In the female non-malignant tumours of the bladder are more accessible, and consequently

more amenable to treatment. Mr Warner* relates the case of a female who was troubled with retention for nearly three years, and who had been much weakened by bleedings from the frequent use of the catheter. Ultimately this gentleman succeeded in introducing his finger into the urethra, when he discovered a considerable fleshy tumour situated near the neck of the bladder. The patient herself discovered this tumour twenty months previously. With a full bladder she was made to strain, when the tumour was pressed forth, and secured by a bent needle, and a ligature passed through its substance. Finally, part of the urethra was divided, by which room was afforded for tying a ligature round the base of the tumour, which was accordingly done. On the sixth day the tumour dropped off. From the day of the operation, urine was voided without assistance, and ultimately a perfect recovery ensued.

Desault, in a case in which he operated for stone, discovered a fungous tumour in the bladder, which he seized with the forceps, and twisted away. In the usual time patient made a perfect recovery.

Malignant diseases of the bladder may, nevertheless, be said to be invariably fatal, though the following case recorded by Dr Braxton Hicks shows that the progress even of a malignant disease may be at least arrested.† Mrs —, aged sixty, had been suffering from great distress in the bladder, making her frequently call out. A quantity of blood and mucus was passed constantly. On examination per vaginam a swelling was detected, apparently in the bladder. This the catheter showed to be a soft mass, which readily bled on being

* Philosoph. Trans. vol. xlv.

† Lancet, vol. ii. 1868.

touched. As she was losing much blood Dr Hicks thought that the disease might be attacked locally.

The patient having been placed under chloroform, the urethra was dilated by a Weiss's dilator; the finger readily passed, and a cauliflower-like mass, the size of a small orange, was found attached to the posterior wall of the bladder. As much of the mass as could with safety be removed was taken away by forceps and the wire rope *écraseur*, with very little bleeding. To the base, solution of perchloride of iron was applied by means of lint passed through the urethra with a forceps. After this the bladder was thoroughly washed out with water.

The effect of this treatment was to restrain bleeding for months. For a week after the operation there was some feverishness, and about the same distress as before; but after this the bladder held urine for a much longer period, and the patient was evidently suffering much less from frequent desire to micturate.

About six months afterwards the bladder became more irritable, and the urine bloody; she was consequently again put under chloroform, the urethra dilated, and the bladder examined. The disease had not recovered its original size, but was firm and smooth. A strong solution of tannin was applied, and the bladder well washed out afterwards. The disease did not appear to have extended beyond the walls of the bladder. The operation did not cause much pain afterwards, and, although she still has forcing down and tenesmus, her state is much more satisfactory than it was on entry; the contrary of which might reasonably have been expected had she been left alone.

There is, thus, some encouragement afforded for

local treatment, even of malignant disease of the bladder. In the advanced stages all that can be accomplished by remedial agents is the alleviation of pain by opiates or other narcotics, and should there be retention, catheterism will be rendered imperative.

RETENTION FROM CERTAIN UTERINE CONDITIONS, AND
FROM PRESSURE FROM THE RECTUM.

In close proximity to the bladder, it will be obvious that displacements of the uterus and lower bowel, or an undue accumulation of their normal contents, or of the adjacent viscera, may, under these circumstances, partially impede, or totally obstruct the discharge of urine.

Of the uterine displacements which so act, the most frequent are simple prolapsus of the unimpregnated uterus,—a condition more frequently seen in aged multipara,—the comparatively rare cases of retroversion of the organ, or a descent of the gravid uterus. Prolapsus of the vagina, in still rarer cases, acts in a similar manner.

The condition to which Dr Barnes has applied the term *occult menstruation* may likewise occasion retention. In this state, owing to the imperforate condition of the hymen, while the uterus performs its function, the menstrual flux accumulates in the *cul de sac* thus formed by the upper portion of the vagina, and may collect to such an extent as by antero-posterior pressure on the urethra, as in the case of the gravid uterus, to arrest the flow of urine; or, again, effusion of blood behind the uterus may be thus induced, giving rise to circumscribed peritonitis, with like results.

Retention in such cases may be complete or incomplete, owing, in the first place, to the seat of the encroachment on the pelvic cavity, and, on the other hand, to the amount of pressure exerted on the urinary canal; and the event is occasioned likewise in a two-fold manner, viz., by diminishing the expulsive power of the bladder, and superimposing an additional element of resistance upon the viscus.

Prolapsus of the rectum, and the pressure or reflex irritation, caused by the presence of large strangulated hæmorrhoidal tumours, occasion, in common with the foregoing condition, the phenomenon under consideration; as likewise distention of the rectum, from an accumulation of scybala, and enterolithic, or alvine concretions.

In structure, these concretions are different from ordinary scybala in presenting a more organised appearance. Being porous, and bound together by a network of intersecting fibrous tissue, interstices are formed, giving, consequently, to these masses a spongy appearance. These interstices are usually filled up with earthy matter. Baillou describes a concretion of this nature completely perforated, through the aperture of which liquid fæces passed. On section they present distinct layers, in the centre of which, forming a nucleus, pieces of bone, cherry stones, and like substances, have occasionally been found. Sometimes the nuclei of such concretions consist of biliary calculi. Of this variety, Portal remarks—"J'ai trouvé dans l'estomac d'un cadavre ouvert pour une des mes leçons d'anatomie une concrétion d'un volume et de la forme d'un œuf de pigeon; elle contenoit dans son centre deux ou trois autres concrétions qui crépitoient

sur le feu; sa substance étoit jaune et amère, véritablement bileuse; enfin dans quelques estomacs on a trouvé des concrétions qui avoient la solidité et la forme des pierres urinaires" (Anatom. Medicale, tom. v. p. 192).*

In addition to their acting mechanically as a cause of retention of urine, scybala, no doubt in undergoing decomposition, give rise to the production of intermediate compounds of an acrid nature, which directly, or by occasioning inflammation, may induce the variety of retention due to spasm from reflex irritation.

Retention of urine from simple prolapsus of the uterus or the vagina, and from retroversio uteri, are diagnosed by digital examination, and are remediable, the urgent symptom of retention, if present, being relieved by catheterism, by one or other of the numerous mechanical appliances which receive professional sanction, and for every modification of which there is no lack of enthusiastic advocates.

Imperforate hymen, as a cause of retention, will demand surgical interference. Retention from pressure of the gravid uterus is characterised by the frequent desire of voiding urine, and a deficient amount being passed; and the fact that those symptoms are more urgent in the erect than the horizontal position, forms a diagnostic feature of value, in discriminating between this state and irritable bladder, and other similar affections of the viscus. Both in these cases, and those of retroversion of the gravid or the unimpregnated uterus, catheterism is frequently demanded; and as deviations from the normal direction of the

* For further reference to this subject, see the words of Sandifort, Morgagni, Lieutaud of Paris (Hist. Anatom. Medica.), Baillie, Van Sweiten, Lassus, Callisen, &c.

urinary canal are thus induced, a flexible catheter, with its stilet withdrawn, is to be preferred to a metallic instrument. Scybala in the rectum are sometimes so firmly impacted as to require scooping out. In these cases, as in the case of alvine concretions, oleaginous enemata should be administered; and the internal administration of laxatives and liquid food are indicated.

Sometimes alvine concretions in the rectum may be reached with the forceps, and thus removed.

RETENTION FROM TRAUMATIC HÆMORRHAGE INTO THE BLADDER, AND FROM RUPTURE OF THE BLADDER.

Retention of urine from traumatic vesical hæmorrhage has not received the attention in surgical works to which the frequency of its occurrence, and the importance of its diagnosis entitle it.

Of this variety, I have seen one example in country practice; and I have been informed of others which have come under the notice of medical friends. My patient was a healthy man, between fifty and sixty years of age. He had never suffered from stricture, nor other affection of the urinary organs. Driving home on a very dark night, he sustained a fall upon the perineum, and on attempting to void urine some time after, he found he was unable to do so. Next day I was requested to visit him, and being apprised of the nature of the case, I furnished myself with a sufficient variety of catheters. There existed great desire to make urine; pain was referred to the hypogastrium, but there was no striking fulness in this region. I passed one or two catheters, as I firmly believed, into the bladder, but instead of urine, only a few drops of

blood flowed. I persisted in my efforts, using every precaution against the possibility of failure being due to the presence of a clot in the eye of the catheter, but with no better result. Having given some general directions, my presence being required elsewhere, I left, promising to visit next day, which I did, accompanied with a brother practitioner; when on this occasion also, we both experienced a repetition of my former failure, notwithstanding that we were alike satisfied that the catheters had reached the bladder. There was a great prejudice against operative interference; but some general instructions being given, we left, I having resolved on urging the propriety of puncture from the rectum on the subsequent day, but on the occasion of my visit I found the patient dead. Some hours before death, he experienced the feeling of something having given way, with a sense of relief. A feature of interest in the case was that the vesical tumour had never assumed very large proportions. A *post-mortem* examination was not permitted, but no doubt remains in my mind that this was a case of rupture of the bladder, due to retention from vesical hæmorrhage.

My friend, Dr Lawrie, of this city, reminds me that our respected teacher, the late Dr Macfarlane, used to relate a similar case which occurred in his practice. The bladder was distended to such an extent as to reach the umbilicus, and nothing but drops of blood flowed from the catheter. Dr Macfarlane, by injecting tepid water, and manipulating with the catheter, succeeded in breaking down the vesical clot, and removing the urine, with the gratifying result of the patient's recovery.

It is essential to bear in mind that in these, as in many other cases of retention, the neck of the bladder becomes elongated to such a degree that the ordinary catheter may be of insufficient length to reach the bladder, and this source of failure must therefore be guarded against. The possibility of vesical hæmorrhage should be ever present in the mind, when retention of urine follows upon direct injury to the perineum or hypogastric region, in persons previously free from any urinary affection, and when the catheter is evidently introduced with ease into the bladder, with the results just adverted to.

The best treatment seems to be the injection of tepid water into the bladder by means of a double catheter, for the purpose of breaking down and removing the clot. Failing the accomplishment of this end, the propriety of surgical interference must be based upon the particular features which each case presents.

Death may ensue either from rupture of the bladder or suppression of urine from retrograde pressure of urine in the ureters, and pelves of the kidney.

Retention from rupture of the bladder, as the result of direct violence, is a circumstance of not uncommon occurrence. Though effusion of urine in certain cases takes place into the peritoneal cavity, it is strictly accurate to include rupture of the bladder among the causes of retention, inasmuch as in such cases as have come under my notice a certain quantity of urine was capable of removal by the catheter. When rupture of the bladder occurs as the result of direct injury the viscus is usually in a distended or semi-distended condition; and the rupture may be complete or incomplete, the latter usually lapsing into the former in consequence

of secondary pathological changes. In addition to rupture from direct violence, rupture of the bladder has been known to occur from retroversion of the gravid uterus into the pelvic cavity. Of this variety a case is related by Mr Linn,* in which it was found impossible to elevate the body of the uterus from its abnormal position in the pelvic cavity, and the retention being otherwise irremediable, and the patient objecting to the performance of an operation, rupture of the bladder resulted. This was accompanied, as usual, with the feeling of something having given way, and followed by a sense of relief. A miscarriage ensued, whereupon catheterism was easily accomplished, but no urine flowed, and death took place on the following day. Of the two varieties of rupture alluded to, the following cases came under my notice during the past three years:—

On the 19th of March 1869, I was requested to visit W. K——, a sawyer, a healthy and powerful young man of about thirty-five years of age. Engaged in shifting a log at his work, he was accidentally struck by it, with considerable violence, on the lower part of the abdomen. Pain was immediately referred to the part struck; there was an urgent desire to void urine; and a catheter being passed, about a cupful of bloody urine was removed, occasioning temporary relief from pain. A second time, on the same day, the operation was repeated with like result. The three following days the catheterism was repeated three or four times daily, always removing more or less bloody urine, and occasioning a grateful mitigation of the very urgent symptom of pain. Patient was seen in consultation by my

* Med. Observ. and Enquir., vol. iy.

friend Dr Lyon, who confirmed the diagnosis made. Death occurred on the 22d.

The symptoms by which this case was characterised were the following:—urgency of micturition, small quantities of bloody urine being invariably removed, and causing a transient sense of relief; pain in the hypogastrium, vomiting, pervigilium, extreme restlessness, and a striking anxiety of expression. There was no external ecchymosis. A *post mortem* examination revealed the existence of a ragged rupture on the posterior aspect of the bladder, contiguous to the reflection of the peritoneum. Patches of inflammation of the bowels and peritoneum were discovered, but comparatively little fluid existed in the pelvic cavity.

Two circumstances may account for the facts, that small quantities of urine were always removed by the catheter, and that relief was thus occasioned. First, the wound was of such a nature that the pressure of urine in the bladder might have caused it to valve itself; and, secondly, its situation, independent of the foregoing consideration, was such as to permit a small accumulation of urine in the viscus; but when this occurred to such a degree as to act upon the rent surface the phenomenon of urgency of micturition was the result, and which may admit of explanation, on the supposition that the irritation thus created gave rise to spasmodic contraction of the detrusor fibres.

It will be obvious that according to the seat of rupture, so will be the extent to which urine will accumulate in the bladder. As in the foregoing case, in one mentioned by Mr Watson, a patient brought into the Westminster Hospital suffering from injury to the abdomen, had four ounces of bloody urine removed

from his bladder the day after. On the evening of the same day, eighteen ounces of similar urine were withdrawn, to the great relief of the patient. The nature of the accident was a fall from a loft, crosswise, upon a beam below. Death ensued despite treatment, and on *post mortem* examination the os pubis was found fractured on each side of the symphysis, and a rounded splinter had been forced into the fore part of the bladder, and so fixed that urine did not flow readily through the wound. Of incomplete laceration of the bladder, ending in complete rupture, the following is an instance :—

On the night of the 24th April 1871, J. R., a young gentleman of about 24 years of age, was knocked down on the street by being struck by a van, one of the wheels passing over the under part of the abdomen. As too frequently happens, he was removed to the police office on receipt of the injury, and was not, it is alleged, seen by a medical man until I saw him early next day. Extensive ecchymosis existed over the lower portion of the spine and the hypogastric region. Retention of urine and local uneasiness referred to the lower part of the abdomen being complained of, a catheter was passed, and a *large quantity* of bloody urine thus withdrawn, followed by a sense of great relief. There was very obstinate constipation which resisted the action of repeated large doses of calomel, scammony, and croton oil; imperfect evacuation of the bowels was obtained by oleaginous enemata. Patient was seen in consultation by my friend Mr Reid.

On the 26th and 27th, the catheter was passed as usual, an average quantity of urine being removed on each occasion.

On the 28th, catheterism failed to remove any urine, and on the subsequent day, death ensued.

A *post mortem* examination revealed, over the lower portion of the back, extensive infiltration of the tissues by extravasated blood having the consistence and colour of thin tar. On opening the abdominal cavity, the bowels were simply found inflamed, a condition which by impairing their peristaltic action must alone have caused the obstinate constipation. In the bladder, a complete rupture existed on the posterior and inferior aspect of the viscus.

From the situation and nature of the wound, and a consideration of the other circumstances detailed, the phenomena of this case admit of explanation on the ground alone, that a partial rent had first resulted, which had ultimately been completed by progressive pathological degeneration. A case of partial rupture of the bladder, associated with rupture of the liver from a similar accident to the above, came under the notice of the late Professor Easton, when Physician to the Royal Infirmary here, and of which this gentleman published an account.

Notwithstanding what has been said to the contrary, rupture of the bladder when complete, as arising from retention, must be looked upon as an inevitably fatal affection.* Should I ever again have occasion to treat a case presenting the features of partial rupture, I should be inclined to fix a flexible instrument in the bladder, and put the patient under the most energetic antiphlogistic treatment, general and local.

* *Vide* "Case of Rupture of the Bladder: Recovery," by Mr Chaldecott of Dorking; and Dr Eben. Watson's Reply to Dr Gillespie of Edinburgh with reference to the same.—Glas. Med. Jour. 1859.

With respect to the comparative fatality of rupture of the bladder as influenced by the locality of the lesion, it is predicable that wounds or rupture of the bladder, involving injury of the peritoneum, are inevitably fatal, while situated elsewhere in the viscus they are not necessarily so; and in proportion to the extent that they are removed from the influence of accumulations of urine in the organ, so are the chances of recovery. The least fatal situation would, consequently, be the antero-superior portion of the bladder, below the reflection of the peritoneum. Of this variety a case has recently been reported to the Surgical Society of Ireland* by Mr Arthur Baker, who had been in attendance in the military hospitals in the recent Franco-Prussian war. A soldier, aged twenty-four, received a gun-shot wound in the neighbourhood of the groin. Three balls entered the body in this situation, two of which, it is alleged, penetrated the bladder, and evidently escaped through the same aperture. After the lapse of some time, an obstruction to the flow of urine through the urethra occurred. The cause of this proved to be a splinter of bone, in all probability detached from the ilium, and which became lodged in the urethra. This was removed by extraction, but some time after symptoms of calculus making their appearance, an operation was performed, and a stone removed in the ordinary manner. Notwithstanding an attack of acute epididymitis the patient made an excellent recovery. Baron Larrey† alleges that he never knew of a case of recovery from wound of any portion of the bladder covered with peritoneum, notwithstanding his extensive experience of such cases in

* Brit. Med. Jour. March 1872.

† Chir. Milit. tom. iii.

warfare. Remarkable efforts at repair are, however, occasionally met with. In the "Archives Generales" for June 1834, there is a report of a case in which rupture of the postero-superior portion of the bladder was survived for the period of seven days; and at the end of this period death was not due to vesical complications, but to surfeit. It was found on inspection, that effusion of lymph took place around the extravasated urine, so as to form a new reservoir.

Larrey, however, mentions several cases of recovery from recto-vesical wounds, in which, notwithstanding that the contents of both cavities passed through the openings, the patients recovered, and that without fistulæ. Bullets entering the bladder have been removed by the lithotomy operation, and the patients have perfectly recovered.

In the Chir. Militaire, the following interesting case is likewise recorded. A man was tossed by a bull, by being gored in the groin, the horn entering under the femoral ligament, and *partially* tearing the bladder, which at the time was full of urine. The inner coat of the bladder being left entire, a hernial tumour, about the size of a pigeon's egg, presented under the crural arch. The external wound was first enlarged, for the purpose of examination; an elastic catheter was passed into the bladder, the membranous tumour by degrees reduced, and perfect recovery ensued.

Dr Thomson, in his report of the condition of the wounded after the battle of Waterloo, mentions fourteen cases of wounds of the bladder in process of recovery.

Treatment.—The indications of treatment in lesions

of the bladder are obviously to secure that important desideratum in all forms of repair, physiological rest, the coaptation of the lips of the wound, to prevent its irritation by the urine, and to subdue inflammatory action. These objects are best accomplished by the constant retention of a suitable catheter in the urethra, by keeping the patient as much as possible in the sitting position, or as upright a position as practicable, the administration of alkalies, local depletion, and the exhibition of calomel and opium, with vin. antimon. sp. eth. nit. &c.

RETENTION OF URINE FROM SHOCK ; LACERATION AND
INFLAMMATION OF THE URETHRA.

Independently of structural lesion, simple shock, affecting the portion of the nervous system by which the bladder is supplied, may be followed by temporary retention. This effect is of the same nature as the familiar influence on the respiratory muscles caused by blows over the epigastric region, the shock to the pneumogastric for the time being suspending its vital function. If the violence be sufficiently severe, the heart may be similarly affected, and the impression so long continued that death results.

Retention of urine, of the variety under consideration, is usually observed in cases when a fall upon the back has been sustained, or from violent compression of the lower part of the body, as in the cases of railway accidents, known as "buffer" accidents. Of this variety I saw one, with a highly intelligent country practitioner, in February last. In this case there was considerable ecchymosis over the lower part of the

abdomen ; the penis, particularly the glans, presented a similar appearance of greater intensity, and the scrotum was similarly affected. The catheter was passed with ease ; the urine withdrawn was perfectly normal, but the power of micturition was in perfect abeyance. From cases presenting analogous features, but complicated with the existence of laceration of the urethra, cases of retention from shock are to be distinguished by the facility with which catheterism^s is effected, the perfect continuity of the urethral surface as judged by the passage of the catheter, the absence of blood in the urine, and the evidence afforded by the *tactus eruditus* of the characteristic difference in the sensation communicated by infiltration of urine in the cellular tissue, and simple ecchymosis.

The treatment of this condition will mainly consist in judicious catheterism.

Contusion of the Urethra may be said to be an aggravation of the foregoing condition, in such proximity to the urethra as by the effusion into the cellular tissue so to compress the urinary canal that voluntary micturition is rendered impossible. In other cases spasm of the urethral muscles is occasioned, whereby a serious obstacle to catheterism is presented. In the more simple forms of contusion of the urethra, the application of leeches, hot fomentations, and warm baths will remove the inconvenience ; in the severer forms, careful catheterism and the administration of mild mercurials will be advisable. Should the sanguineous effusion be of an aggravated nature, incisions into the part may be rendered necessary ; and should sloughing of the tissues occur to such an extent as to involve the patency of the urethra, a catheter must be

retained in the bladder, to permit healing by granulation round it.

Laceration of the Urethra, as a cause of retention, is a much more serious affection, which, in addition to the foregoing symptoms, presents the complication of infiltration of urine into the cellular tissues, and its consequences. It may be the result of direct violence, or take place during violent efforts of micturition, as against the obstacle of an enlarged prostate, or stricture of the urethra.

Arising from the former cause, it is recognised by following immediately upon an injury, by acute pain in the region of the anus and perineum, by the presence of ecchymosis, by the evidence afforded by the passage of the catheter, and the occurrence of considerable tumour or swelling in the perineum, containing blood and urine, and affording to touch a characteristic resilient doughy feeling. Forthwith general infiltration of the tissues ensues, and unless prevented by surgical interference, gangrenous patches appear both over the seat of injury, and on the glans penis and adjacent parts, succeeded by muttering delirium, general typhoid symptoms, and death.

In the latter instances patient has suffered from chronic impediment to the passage of urine, and during a violent effort of micturition he suddenly experiences the feeling of something having giving way, and the expulsion of small quantities of urine is now rendered possible, as relaxation of the stricture or spasm succeeds. The other symptoms are those of laceration from direct violence, with the exception of the primary ecchymosis.

The treatment of retention from laceration of the

urethra resolves itself into local and constitutional. By the former it is endeavoured to remove any urine that may have escaped into the cellular tissue, and to prevent any further infiltration. These ends are accomplished by free and deep incisions into the parts permeated with urine, and by the constant retention of a catheter in the bladder, until the laceration may have healed. Should sloughing threaten, the application of poultices and fomentations may expedite its removal. By the constitutional treatment, it is expedient to obviate acridity of urine by the administration of alkalies; the bowels should be kept open by the exhibition of aperient medicines; for which purpose mild mercurials may be conjoined with rhubarb or colocynth pill mass; pyrexial symptoms should be treated with such febrifuges as antimonial wine, in combination with aq. acet. ammon. and sp. eth. nit., for that these remedies do influence and remove many febrile symptoms is one of the few ultimate facts on which the scientific claims of Medicine rest. Pain will be relieved by the exhibition of opium, and sleep procured by the same agent, bromide of potassium, or chloral hydrate. To prevent stricture, the catheter must be occasionally passed.

Retention from Inflammation of the Urethra.—In common with all other mucous tracts of the body, the urethra is liable to inflammation. Whether there exist two varieties of urethral inflammation capable of pathological distinction, is one of the *questiones vexatæ* of the day, and one on which it is foreign to the object of these remarks to dilate.* Certain it is, that inflammation of the urethra, whether specific or non-specific,

* *Vide* Author's Paper, Brit. Med. Jour., 1870.

is capable, under certain circumstances, and *according to the portion of the urethra* affected, of operating as a cause of retention of urine.

Inflammation, when situated in the membranous and bulbous portion of the urethra, occasions retention ; when in the prostatic portion of the urethra, incontinence is the result.

Why should retention arise, on the one hand, from a common cause, and incontinence on the other ? In the first place, the result depends on the violence of the inflammation, when situated in the urethra proper ; if the urethritis is mild the bladder is not necessarily affected ; if violent, retention is caused—and this may be due, first, to engorgement of the cellular tissue of the penis by inflammatory products ; or, secondly, by causing spasm of the urethral muscles through *the pudic nerve* ; in the prostatic portion of the urethra the *hypogastric branches of the sympathetic* are affected, and irritability of the detrusor fibres of the bladder thus occasioned.

Inflammation of the urethra may arise from venereal contagion, exposure to cold, mal-assimilation, by which the urine is charged with irritating compounds, the violent use of instruments, from sexual intercourse during the catamenial period, and from sexual congress with females suffering from leucorrhœal discharges ; as also from the use of too violent diuretics, injury, and the employment of too irritating injections.

When the retention of urine is not complete, inflammation of the urethra is characterised by tumefaction of the penis, pain in the act of micturition, pain on pressure along the surface of the urethra, inflam-

matory blush around the meatus, sympathetic inflammation of the inguinal glands, and if extending to the prostate, the occasional presence of blood in the last drops of urine voided, very troublesome incontinence, and if of an aggravated nature, with marked febrile disturbance.

Inflammation of the urethra, if severe, demands the most active treatment, as occasional cases of fatal sloughing of the entire organ and contiguous structures are on record. In these cases antimonials and febrifuges are demanded; local blood-letting by means of leeches to the perineum, hypogastrium and groin should be enjoined; and warm baths are particularly grateful to the patient, and eminently effectual in diminishing inflammatory action. The diet should be spare, alkalies may be administered, and indulgence in alcoholic stimulants firmly forbidden. If there is complete retention of urine, a small catheter, well warmed and lubricated with almond oil, should be gently passed.

If the case be one of gonorrhœa, and seen in the primary stage, the abortive treatment will usually succeed in cutting short the progress of a troublesome affection. A strong solution of nitrate of silver, or the solid caustic, should be applied to the fossa navicularis. Its other stages are best treated by *small* doses of balsamic remedies, and weak injections as circumstances determine. Inflammation of the urethra sometimes terminates in abscess and perineal fistula. It is desirable, in these cases, that an instrument be kept in the bladder during cicatrization; or if not practicable, that one should be introduced as frequently as the exigencies of the case permit. I have repeatedly seen incontinence of urine of a very troublesome nature

induced by the forcible injection of irritating lotions so far back as the prostate. Of this nature, a case came recently under my notice. A Canadian gentleman, who had been under the care of a London practitioner for several months for a gonorrhœa, brought on enuresis by thus forcing an injection far back into the urethra, under the very general and delusive impression that he was thus improving his chances of recovery. Of this infirmity he got better before leaving the metropolis; in Glasgow, however, the discharge returned, probably from a fresh contagion, and he had recourse to injections, with a return of his troublesome complaint to such an extent, that he was under the necessity of wearing a urinal. I put him under the treatment detailed in the sequel (chap. iv.), and he soon recovered.

RETENTION OF URINE FROM TUMOURS IN THE SCROTUM,
PENIS, AND PERINEUM.

The presence of adventitious growths in the neighbourhood of the urethra may obstruct the flow of urine by pressure on the urinary canal.

Thus hydrocele, scrotal hernia, aneurism of the corpora cavernosa, fibroid growths, cysts in the urethra, and cancer, may so operate.

These causes of urinary retention are essentially rare, and further consideration of them does not come within the scope of these remarks.

RETENTION OF URINE FROM ENLARGED PROSTATE ;
DISEASED PROSTATE.

Perhaps the most frequent cause of retention of urine in the aged is enlargement of the prostate. Sir Benjamin Brodie was wont to remark that, consentaneous with the appearance of grey hair, and the presence of the *arcus senilis*, enlargement of the prostate almost invariably occurred.

Of the frequency of prostatic hypertrophy, Sir Henry Thompson entertained some doubt ; and he instituted the following investigation, which is certainly subversive of the generally entertained belief. Having examined the male bodies over fifty-five years of age who died in the Marylebone Infirmary during a given period, and afterwards in the Greenwich Hospital, amounting in all to two hundred cases, taken promiscuously, it was found that but one in three presented the feature of enlarged prostate, and that not more than one in seven complained during life of symptoms significant of this condition.

In structure, the prostate is essentially a muscular body, in the substance of which a number of urethral glands are imbedded. These glands consist of a terminal vesicle and a duct, which, by further subdivision, opens on the prostatic surface, and which are originally developed, no doubt, from the mucous glands of the urethra and neck of the bladder. They secrete an *acid* secretion termed the *liquor prostaticus*, which subserves, in all probability, some essential purpose in the generative economy.

Like the several organs whose structure we have

been considering, the prostate is composed of two coats—an external one composed of numerous plain or organic muscular fibres, and an internal one consisting of circular fibres continuous posteriorly with the sphincter vesicæ, and which performs for that portion of the urethra a like function to that of the sphincter vesicæ for the bladder. The capillary blood-vessels of the prostate, spread out upon the ducts and clusters of vesicles, which are united by areolar tissue, and lie somewhat superficially, and are supported by processes of the deeper layer of the investing fibrous capsule. The arterial supply of blood of this organ is from the hæmorrhoidal and pudic arteries. Its veins, which are said to be highly developed in old subjects, form a network round the side and base of the gland, and its nerves, as we have seen, are derived from the hypogastric plexus of the sympathetic, as its functions are of an organic nature.

Enclosed in a dense fibrous capsule divisible into two layers, and continuous with the recto-vesical fascia, three lobes of the prostate, as usually described, are recognised—viz., two lateral, and a middle or third lobe, to which, and not originally by Sir Everard Home, attention was in this country first directed by the celebrated John Hunter, in describing “a small portion (of the gland) which lies behind the very beginning of the urethra, and swells forward like a point into the bladder.” It is true Sir Everard Home prominently drew attention to this portion, and to the consequences of its enlargement. In figure the prostate is usually compared to a chestnut, and its dimensions are an inch and a-half transversely, an inch longitudinally, and three-quarters of an inch vertically.

Enlargement of the prostate, from a pathological point of view, has been divided into two varieties, according to the portion affected,—the parenchymatous, in which the muscular tissue of the organ is involved, and the glandular, in which, as the term implies, the glands and ducts are the seat of disease. The former is more frequently a disease of early life, and is usually due to vascular excitement, or chronic irritation at the neck of the bladder, arising either from abnormal conditions of the urine, or preternatural excitation of the generative organs, as from excessive venery, masturbation, &c. Marked enlargement of the prostate is, therefore, observed in cases of chronic prostatitis, associated with spermatic incontinence. In these cases, as pointed out by Mr Guthrie, a transverse band occupies the neck of the bladder, and offers an obstruction to the flow of urine, which it is expedient to distinguish from enlargement of the middle lobe.

Glandular hypertrophy, on the other hand, is essentially a disease of old age, and of slow progress. In extreme cases the gland has been found enlarged to the size of the closed hand.

In intimate structure the enlarged prostate offers no pathological textural deviation from that of the normal gland. There is neither increase of the vesicles nor ducts, but simple enlargement of them. The cause is presumably the same as that of the parenchymatous variety.

Enlargement of the prostate may be divided into four varieties, viz., unilateral, bilateral, general enlargement, or marked enlargement simply of the so-called middle lobe. If the unilateral variety predominate, the urinary canal is so encroached upon as to make its

course tortuous in this situation; if uniformly bilateral, a serious obstruction to the flow of urine from prostatic stricture is caused; and if there be general hypertrophy of the lateral lobes, obstruction to the flow of urine may or may not result, just, evidently, in proportion to the outward resistance offered by the fibrous investment of the prostate; while most frequently of all, enlargement of the middle lobe offers an obstacle to the passage of urine. This state may be markedly predominant either with or without general prostatic enlargement. In these cases the middle lobe forms a nipple-like valve at the neck of the bladder, projecting into the cavity of the organ, and attaining the size of a walnut, or hen's egg. The form of tumour may be smooth or rough, lobular, or most frequently it is pyramidical.

The bulk of the enlarged middle lobe is further augmented by the mucous fold lying between it and the lateral lobes, and, according to Sir Everard Home, "As the tumour and transverse fold are situated immediately behind the orifice of the urethra, they are pushed forward before the urine in every attempt that is made to void it, acting like a valve, and closing up the opening till the cavity of the bladder is very much distended, when, the anterior part of the bladder being pushed forward, and the tumour being drawn back in consequence of the membrane of the posterior part of the bladder being put on the stretch, the valve is opened, so that a certain quantity of water is allowed to escape; but the bladder is not completely emptied."

It will be obvious from the foregoing remarks, that enlargements of the prostate, in addition to simple mechanical obstruction to the flow of urine, operate in

this respect also, by bending the urethra upon itself, and in some cases by division of the canal.

It is impossible, absolutely, to distinguish in the living subject between parenchymatous and glandular enlargement of the prostate. The former condition may be surmised, if the enlargement occurs in the comparatively young; and when it is associated with prostatitis, it is attended with deep seated pain round the neck of the bladder, extending to the rectum, and causing tenesmus and painful defæcation, while the last few drops of urine discharged usually contain blood, and the termination of the act is marked by a distinct exacerbation of the pain. Furthermore, the increased size of the prostate, in either variety of hypertrophy, is recognised by passing the finger into the rectum, while pain on pressure is only elicited in the cases complicated with inflammatory action.

In consequence of this obstruction to the flow of urine, and the increased bulk at the neck of the bladder, the orifice of the urethra is elevated, and the bladder is never completely emptied; the urine is discharged in a dribbling stream, but in stricture, though the stream may be small, it is generally continuous. It is likewise involuntarily discharged, not unfrequently during a violent fit of coughing, sneezing, &c.; and the bladder being thus never completely emptied, the residual urine in the first place diminishes the vesical capacity, necessitating frequent calls to make water—attempts at once unsatisfactory and harassing; and again, as a consequence of the indefinite retention of urine in the bladder, decomposition ensues, occasioning vesical irritation, cystitis, and its concomitants; and finally, the coats of the bladder become hypertrophied in conse-

quence of the constant straining, just as enlargement of the right ventricle of the heart ensues in cases of pulmonary emphysema and chronic bronchitis. Again, the violent efforts of micturition may cause protrusion of the mucous membrane of the bladder between its hypertrophied fibres in one or more places, and thus cause vesical pouches, in which urine is apt to be retained, and where calculi are, therefore, so liable to form. From the same cause, urine may accumulate in the ureters and pelves of the kidneys, causing hydro-nephrosis, suppression, or ultimate atrophy of one or both organs.

The extent to which enlargement of the prostate operates as a cause of retention, is to be judged by the quantity of urine which is found in the bladder after micturition, bearing in mind the possible existence of pouches. For the constitutional treatment of enlarged prostate several remedies have been extolled—have flitted across the kaleidoscopic and evanescent field of therapeutical vision, and have ultimately fallen into merited oblivion, leaving us at least one consolation (and the possession of *one fact* is a great consolation), that we are in ignorance of any medicine which exercises an influence over prostatic enlargement.

Judicious catheterism, attendance to the general health, the treatment of complications on general principles, and the avoidance of all causes of irritation of the pelvic viscera, embrace everything that can be done for this distressing ailment.

Retention from Diseased Prostate.—As the morphological analogue of the uterus, the prostate is liable to similar affections to those of that organ. Accordingly, it is occasionally the seat of fibroid growths, which, by

pressure on the urethra, occasion retention of urine. These growths vary in size from that of a pea to the bulk of a bean or hazel nut, and when situated towards the outward surface of the gland they impart to it a nodulated appearance.

The prostate is likewise the seat of tubercular deposition, which may result in abscess communicating with the rectum or pelvic cavity, and which may thus terminate fatally.

More rarely, cancer is situated in this portion of the urinary canal, and when it does so occur, it is usually in the form of medullary carcinoma. Calculous concretions, in aged persons, are also of occasional occurrence in the prostatic ducts, and when they do not occasion sufficient irritation to cause occlusion of the urethra by inflammatory products, they give rise to vesical irritability.

The treatment of these conditions will depend on special features of each case. Tumours have been removed from the prostate by operation.

RETENTION OF URINE FROM STRICTURE OF THE URETHRA.

By stricture of the urethra is implied a coarctation of the canal more or less complete. It has been customary to divide strictures into three varieties,—the inflammatory, the spasmodic, and the permanent or organic. Upon the first variety we have adverted in treating of retention of urine from inflammation of the urethra, and recapitulation here is unnecessary. Of the existence of spasmodic stricture doubt has been long entertained, and even yet expressions sceptical of

its existence emanate from the *Dii majores* of the profession, notwithstanding the indisputable demonstration of the existence of muscular fibres in the urethra.

Thus, Sir Henry Thompson somewhat recently expresses himself on the point at issue :—" I will tell you what spasmodic stricture is. It is exceedingly useful as an excuse for the failure of instruments. It is a refuge for incompetence. When you cannot pass a catheter, when you find it exceedingly difficult to get anything in, and in fact wish to desist, it is a convenient thing, and it has always been so recognised, for the doctor to say 'there is spasm.' Indeed, I believe he often lays the flattering unction to his soul that it does exist, *although in my opinion it does not*, or at least very rarely. 'There is spasm,' says he, 'now in the muscles, and it will be prudent at present to desist from further attempts to pass an instrument,' *and no doubt when this is said it is so*. Now, I do not think that you ought ever to fail in passing an instrument because there is spasm. Spasm may prevent the urine from going outwards ; I do not know that it ever prevents the instrument from going in. In most cases it is a failure of the hand, not spasm of the urethra." In these didactic, and, I fear, self-contradictory passages, Sir Henry Thompson disposes very summarily, and not less mercilessly, of, I am persuaded, a considerable class of intelligent practitioners who entertain different convictions on this subject. When it is borne in mind how much cynical pleasure is derived, by so many members of the medical profession, from differing on almost all topics from their contemporaries (and it may be urged in excuse of this failing, that, particularly in the teaching of medicine and surgery, it is indispensable

so to impress pupils with a sense of the "professor's" penetration), *outré* opinions should receive a more reserved acceptance than is usually accorded to them, unless they are presented on the basis of rational argument and experience. These remarks are, of course, of general application, not special; and it is intended by them to convey the writer's belief, that it is equally creditable, though possibly not equally profitable, conscientiously to be able, from honest observation, to corroborate the experience of men of character, as it is to fly in the face of their accumulated experience, either with new remedies or new doctrines in hand.

I admit that it is not to be expected that every one,—that even a small percentage of practitioners,—can ever hope to be possessed of the manipulative dexterity of the distinguished authority referred to, but I claim for men of whose skill I am assured, and whose veracity is unimpeachable, a sufficient degree of tactile delicacy to distinguish between awkwardness and spasm; and I am persuaded that, in common with many of this description, I have met with numerous cases of urethral spasm, of such severity, as for the time being absolutely to obstruct the passage of the catheter into the bladder, and where, without resorting to means for relaxing the spasmodic condition of the urethra, it would have been at once unjustifiable and perilous to force a passage.

In a case of my own to which I am occasionally called for the relief of retention, and where organic stricture of the urethra exists,—for which, however, patient declines surgical interference,—I frequently find that I am unable to get the smallest sized catheter into the bladder, but the insertion of the smallest portion

of the catheter into the stricture is succeeded by a discharge of urine in moderate stream, and at intervals catheters of medium size are capable of being passed through the stricture. I am firmly persuaded in this case—persuaded to the extent that the evidence of my senses are reliable—that spasm of the organic stricture is of periodical occurrence, and, moreover, that the seat of the spasm is the distal side of the stricture. When strong efforts of micturition are made, the canal is, presumably, full of urine up to the situation indicated, but no sooner is this part mechanically dilated, than the urine fills the entire canal, it flows in a tolerable stream, and retention does not recur for an indefinite period. That we have to deal with spasm of the muscular structure of the urethra, or of the *acceleratores urinæ*, and *transversi perinei* muscles in certain cases of obstruction to the passage of instruments, is further demonstrated by the facility with which catheterism is effected in the same individual when anæsthetised, or when after possibly a brief interval, as of a night, no obstacle presents on the following day.

Spasm of the urethra may involve almost its whole length, or be confined to a part thereof, more particularly the seat of the muscles just mentioned, and it will be occasioned by the operation of any irritant on these structures. Of such causes of irritation may be mentioned such as are constitutional, comprising an irritating condition of the urine from perverted assimilation; the application of fly blisters, whereby the *cantharadin* is absorbed, and being eliminated by the urine, acts *in transitu*; and such causes as are pathological, of which may be enumerated stone in the bladder, worms in the rectum or bladder, and other forms of irritation, how-

ever variously produced, of the vesiculæ seminales and testicles, and hyperæsthesia of the prostate as arising from inordinate sexual congress, &c.

Should these conditions be of sufficiently prolonged duration, the antecedent irritation is supplemented by the effusion of coagulable lymph into the cellular texture of the penis, and the following variety of stricture will be caused.

By *organic or permanent stricture* of the urethra is understood an encroachment more or less complete on the calibre of the urinary canal, by the effusion of coagulable lymph into the cellular structure of the penis, and the consequent obliteration of this form of tissue by the agglutination and contraction of the cell walls with one another. As in the case of enlarged prostate, stricture of the urethra may be unilateral, a condition which gives rise to the painful manifestation of chordee, bilateral, or general, *i.e.*, either involving the corpora cavernosa, with or without the corpus spongiosum; the two latter conditions, in a more especial manner, interfering with the function of micturition. Furthermore, one or more strictures may exist at given intervals on one or both sides of the urethra, and they may vary in extent from that of a delicate membrane drawn across the urethra, with a central aperture through which a bristle can with difficulty be passed, to obstructions of an inch or more in extent with equally diminished canals. As all inflammatory affections are preceded by various forms of irritation, so do we recognise various sources of the initial irritation which occasions urethral inflammation and its consequences; and as it accords with a pathological law, that according to the vascularity of the part so is its proneness

to take on inflammatory action, hence, in obedience to this law, certain parts of the urethra are more liable to stricture than others.

Of the primary cause of stricture various forms of irritation have been recognised. Exclusive of diseases of the pelvic viscera which, by first causing spasmodic stricture, in turn occasion the organic variety, stricture has been referred to constitutional cachexiæ, but as aggravated forms of stricture are almost invariably associated with sympathetic systemic derangements, of the type denominated dyspeptic and nervous, it is manifestly difficult to establish the direct relationship as cause and effect. Admitting, as possible, the production of stricture of the urethra, as arising primarily from constitutional causes, it is nevertheless certain that its most frequent cause—its cause *par excellence*—is localised inflammation from specific venereal contagion.

On instituting an examination of the urethra from behind forwards, its colour, whereby the extent of its vascularity is judged, is observed to vary at different portions. In the prostatic portion of the canal, and between the bulbous portion and the meatus, compared with the bulbous and membranous portions, the urethra presents a pale appearance; here the surface is of a dark red colour, owing to its greater supply of blood vessels. Accordingly, stricture of the urethra occurs in the following order,—in the membranous portion, in the bulbous portion, and at the fossa navicularis, where from indefinite lodgment of the poison chronic irritation is kept up. The consistence of stricture of the urethra seems to bear a direct ratio to the duration of its existence. When of long standing it is paler in colour than other portions of the canal,

—a condition due, doubtless, to vascular obliteration by inflammatory products, and it varies in density from that of simple infiltration to that of cartilage; while intense sensitiveness of surface characterises some varieties, and diminished sensibility others.

The incipient stages of stricture are of insidious incursion, the first symptoms usually pertaining to imperfect discharge of urine; while, in some cases, patients are ignorant of any such condition until apprised of it by the fortuitous examination of the medical attendant. In the less severe forms of stricture, the first symptom which attracts attention is the diminished calibre of the stream of urine, though it is, nevertheless, discharged in a continuous stream—a feature by which such cases are distinguished from impediment to micturition from enlargement of the middle lobe of the prostate. In severer cases the stream of urine is spiral, forked, discharged perpendicularly to the penis, or it may be rendered so imperfect as to be voided *guttatim*. When the stream is small and continuous it may be inferred that general coarctation of the canal exists; when spiral, that unilateral diminution of the canal is present; and when forked, that one or more strictures probably exist, of which one is situated near the fossa navicularis. During micturition a burning sensation is generally referred to the strictured portion, and for some time after a quantity of urine which had become lodged between the stricture and the bladder continues to ooze out of the urethra. In consequence of the obstruction thus presented, the muscular coats of the bladder become hypertrophied, as we have seen to be the case in prostatic enlargement, the bladder is seldom perfectly emptied, and hence vesical irritation

ensues, causing, consequently, frequent attempts at micturition, both from the irritation and the encroachment on the normal capacity of the bladder, and in some cases the attempts at micturition may be so frequent and so violent that rupture of the urethra and perineal fistulæ are the result. Again, stricture of the urethra by the chronic irritation that it keeps up causes frequent erections of the penis, sometimes simulating priapism, and frequent seminal emissions, in addition to which a mucous discharge from the urethra, which may become purulent, and be easily mistaken for gonorrhœa, is one of the most invariable symptoms. The mucous discharge from stricture exhibits this proneness to become purulent when the stricture is subjected to irritation, and, consequently, it assumes this form after repeated coitus. From gonorrhœa it is to be distinguished by the diminished ardor urinæ, by the fact that it occurs sooner after coitus than regular gonorrhœa, that it has occurred before under like conditions, and that it is more capable of speedy removal. Sympathetic irritation of the testicle and inguinal glands from stricture is an occurrence not unfrequent.

Treatment.—If the retention of urine be obviously due to spasmodic stricture of the urethra, it is not prudent to endeavour to effect forcible entrance into the bladder, for the very presence of the instrument may be the immediate cause of the spasm. If the case be not an urgent one, warm baths should be advised, conjoined with the internal exhibition of full doses of opium, belladonna, and bromide of potassium; and a gentle attempt should be made to pass the catheter while the patient is in the bath. Should the emptying

of the bladder be a consideration of more urgency, the patient should be at once put under the influence of chloroform, when in all purely spasmodic strictures catheterism will be thus easily effected.

Into a detailed review of the treatment of organic stricture it does not come within the purport of these observations to enter, and the following epitome must therefore suffice.

In cases of retention of urine, no matter from what cause, the first indication is palpably to relieve the patient of the accumulation of urine, and the safest method of accomplishing this object is by means of the catheter. As organic strictures of the urethra sometimes take on the complication of spasm, it will be obvious that in many cases the treatment employed for the spasmodic form will also be appropriate to a certain extent for this variety. Consequently, when the case presents unusual difficulties, warm baths and full doses of opium may be beneficially resorted to. When the canal is very tortuous, as arising from one or more unilateral projections, the elastic catheter with the stilet removed is to be preferred to the metallic instrument; but when there is no such deviation, but apparently a general diminution of the urethral calibre, I have succeeded with the metallic catheter where the flexible one was found useless. Bleeding, general and local, was at one time freely resorted to in cases of difficult catheterism from organic stricture, and I am far from believing that cases do not present themselves where the adoption of this treatment may not be beneficially resorted to, despite the contemptible influence of fashion. Before attempting to pass the catheter the urethra should be completely injected with oil, and

for this purpose I think fine almond oil is to be preferred to any other variety, or the catheter to be employed may be filled with the oil by immersion in it, and the oil be retained therein by the pressure of the finger on the outlet, the instrument passed down to the stricture, the finger removed, and careful catheterism be then attempted.

A very ingenious instrument for troublesome cases of stricture, more particularly those complicated with false passages, has been invented by Professor Gourlay of New York. His description of the instrument and method of application are as follow:—"The catheter is three millimetres in diameter, nearly corresponding with No. 3 of the English scale, and is conical, its point being two millimetres in diameter, about equal to No. I. of the same scale. A groove on its convex side extends a distance of four inches, and is bridged over in its last twelfth of an inch so as to form a canal for the reception of a delicate whalebone guide. The catheter eye is on the concave side of the instrument, about three-fourths of an inch from its point, and is kept closed by a well-fitted stilet. The curve of the instrument is equal to the one-fifth of the circumference of a circle three inches and a quarter in diameter. The manner of using it is as follows:—With a small syringe the urethra is to be well filled with olive oil, and an attempt made to introduce a probe pointed whalebone guide half a millimetre in diameter, and the length of an ordinary bougie, the point of which may be made temporarily spiral by immersion in boiling water, then twisting round a small staff, and suddenly cooling it. If its point becomes engaged in a lacuna, it is to be withdrawn a little, and again carried onward

with a rotatory movement. If it enters a false passage it is to be retained *in situ* by the left hand, while another is passed by its side. If this second guide makes its way into a false passage, it is to be treated precisely as the first was, and the operation repeated till one guide can be made to pass the obstruction and enter the bladder. Sometimes five or six guides are thus caught before the false passage is filled up, and the natural route opened. As soon as the bladder is entered by the guide—which may be known by the instrument being easily moved in and out—the other guides are to be withdrawn, the free end of the retained guide passed through the canal at the end of the catheter, and this instrument carried down the urethra along the guide until its point reaches the stricture, when generally, with slight pressure in the right direction, the catheter may be made to enter the stricture, and finally pass into the bladder.

“The guide may be kept in position after the withdrawal of the catheter, and dilatation carried on by the successive introduction of larger sized catheters of the same construction; or division may be resorted to by means of Mr Holt’s or Sir Henry Thompson’s instrument, modified by means of the terminal canal for the passage of the guide; or internal urethrotomy may be practised with any of the various urethrotomes, having only this simple modification; or, as has already on several occasions been done, the retention catheter may be made available for external urethrotomy, instead of Mr Syme’s staff.”

Sometimes, in cases of light stricture, the passage of an instrument is facilitated by desiring the patient to endeavour to pass water while the catheter is pushed

gently forwards ; by this means the mucous folds are obliterated, and the chances of making false passages considerably diminished. When once an instrument is got into the bladder, the difficulty experienced and the risks incurred should convey the salutary lesson that it should not be withdrawn sooner than the exigencies of the case demand, care being taken that only the smallest portion of it enter the bladder. When removed after a few days' retention, it usually happens that a larger instrument can be easily passed, and that the stricture admits of being gradually dilated by the successive use of catheters of increased size, or by means of such instruments as Dr Buchanan's compound catheter, Holt's dilator, &c. Or urethrotomy may be resorted to if special features in the case so demand.

The treatment of stricture by potassa fusa and lunar caustic may be said to have fallen into desuetude since the introduction of the modern instruments referred to, though there are not yet wanting individuals who advocate this method of treatment.

Failing the introduction of an instrument into the bladder, the safety of the patient demands that the bladder be emptied, and to effect this one of three methods is usually had recourse to, viz., puncture from the perineum, supra-pubic puncture, or puncture of the bladder from the rectum. The first method is seldom resorted to, and of the other two, puncture from the rectum is correctly esteemed the safest and easiest operation, requiring, as it does, no preliminary cutting, and affording, by the situation of the aperture, a greater certainty of complete evacuation of the bladder, and less risk of peritoneal inflammation. It is true that, in the supra-pubic operation, extreme distension of the

bladder presents a larger surface uncovered by peritoneum than that afforded in the operation by the rectum, and that the prostate gland may in some instances be of such magnitude as to encroach on the surface of the bladder available for the latter operation—that corresponding to the trigonum vesicæ—but except in extreme cases of this condition, the risks of the supra-pubic operation are so incomparably graver than those of the rectal, that only the most exceptional circumstances would justify its adoption. I have seen death result from the supra-pubic operation where the operation had been skilfully performed, and the utmost care had been taken to prevent infiltration of urine into the peritoneal cavity, while *post mortem* examination disclosed evidences of peritonitis.

RETENTION FROM PHIMOSIS, AND OTHER ABNORMAL CONDITIONS OF THE PREPUCE.

This variety of suppression is the *Ischuria Phimosica* of Sauvages, and is most frequently seen in children as the result of preputial irritation. When the preputial orifice becomes so contracted by cellular tumefaction as to arrest the discharge of urine, circumcision may be required.

Of the other abnormal conditions which occasionally cause retention of this variety, may be enumerated warty excrescences of a venereal, or simple nature, inflammation of the foreskin by which it may become agglutinated to the glans, carcinoma, and inflammation from undue accumulation of sebaceous matter, which may ultimately become so inspissated as to form cal-

culous concretions (calculi glandis). These several conditions will be remediable by general treatment appropriate to each variety.

MECHANICAL RETENTION OF URINE.

Stone, &c., in the Urinary Passages.

In the foregoing classification of the various forms of retention of urine, it has been found somewhat difficult to assign its appropriate place to that variety having for its cause congenital occlusion of the ureter; and it is accordingly included under this section. These cases are extremely rare, and of one of them Bonetus gives the following description* :—" Nam venis magnis per superficiem sparsis prædictus erat tumor; et in ejus parte superiore, aliquid rubicandi instar placentæ uterinæ apparebat—aperto tumore invenimus eam repletum fuisse copia seri ingenti; tandem que deprehendisimus renem dextrum in ejusmodi molem excrevisse, et tumorem illum efformasse, qui tandem ren et a figura sua naturali, et a substantia plurimum discrepabat, cum crassissimæ membranæ admodum similis, *ureter quoque dexter plane erat impervius.*"

Obstruction of the ureter from clots of blood (urethro-thromboides),† from catarrh (uretero-phlegmatica),‡ from purulent accumulations (uretero-pyica), and from inflammatory agglutination of the walls of the ureter, are described by the older authors. These causes of retention, it need scarcely be mentioned, are extremely rare, and it is impossible to conceive that they can exist independently of renal or vesical disease. The ureter

* Lib. iii. de Urin. Suppress. † Gaub. Instit. Pract. de Ischur. Spur.

‡ Schacht. Institut. Med. Prac.

is also the seat of hydatids in equally rare instances. The diagnosis of such cases is necessarily obscure, and presents no features indicating or demanding special treatment.

Stone may act as a cause of retention in any portion of the urinary canal, and it may do so in a twofold manner—first, by causing spasm when the canal is incompletely occupied by it ; or, secondly, by complete occupation of the canal, and simple mechanical obstruction. Indirectly, stone may obstruct the passage of urine by causing inflammation and coarctation of any part of the urinary tract by the effusion of inflammatory products.

The symptoms of stone in the pelvis of the kidney have been already referred to. In the bladder this condition is indicated by the intermittent obstruction of the passage of urine, the stream being full when passed ; by vesical irritation and inflammation, as manifested in the state of the urine ; by the sympathetic pain in the glans penis ; and by the fact that the pain in the bladder suffers exacerbation after micturition ; and, finally, by the conclusive evidence afforded by the passage of the sound. In the urethra, stone will be discovered by the more or less complete retention of urine, by the presence of a hard body being felt in the urethra, and by the passing of an instrument. It is rarely that stone completely occupies the urinary canal ; more frequently the urine is permitted to filter through one or more calculi. Thus Desault remarks :—"On a même trouvé dans plusieurs cadavres les urèteres pleins de graviers, à travers lesquels se filtrait ce fluide, sans que son excrétion en fut aucunement empêchée." The portion of the ureter in which stone is

most liable to become impacted is its vesical orifice, spasm of the small muscular fibres, to which we have already referred (page 70), doubtless obstructing its passage into the bladder.

While it may be submitted as a pathological law that muscular fibre enlarges in a direct ratio to the amount of work imposed upon it, of which law abundant testimony is furnished by such conditions of the bladder, ureters, and kidneys, as are usually found in cases of obstruction, it is nevertheless true that, in exceptional cases, atrophy, and not hypertrophy, is the result. This may, perhaps, be difficult of explanation. One thing at least is certain, that the normal proportions of tissue depend upon a healthy co-ordination between the function of absorption and that of repair. In cases of obstruction to the passage of urine, those portions of the urinary canal which have additional work imposed upon them suffer, in the first place, a low form of inflammatory action, fibrine is deposited from the blood, and splits up into the usual forms by which it becomes organised, and hypertrophy is the result, alike because coagulable lymph is effused in greater proportion than in health, and absorption is correspondingly impaired by the presence of the inflammatory products; but should enervation of any part ensue, less blood is sent to it, and a preponderance of functional activity is thrown upon the absorbents, more material is removed than deposited, the muscular fibres become friable, lose their colour, diminish in size, and ultimately disappear. The same obtains in the case of glandular structures. Hence parabysmic enlargement of the kidney may take place to such a degree as to obstruct the ureter at its orifice,

and the organ attain to such dimensions as to weigh from thirty-five to forty pounds.* In other cases it may become so atrophic as scarcely to weigh a few drachms, or it may be distended into a congeries of cells ; or the interspace between the obstruction and the kidney may be occupied by a large fluid tumour, wherein no vestige of the renal structure remains but the fibrous investment of the organ. Above the seat of obstruction, when that is complete, the ureter may be dilated into such a large pouch as to contain many pints of fluid.

The diagnostic features of stone in the urinary passages have been already referred to (page 17). If the obstruction be complete, and in both kidneys or ureters, its discrimination from suppression, during life, will be impossible ; and this will obviously be of little moment, as in such cases death would inevitably ensue. For stone impacted at the orifice of the ureter, it has been suggested to inject tepid water into the bladder. To this might be added belladonna, morphia, or other narcotics, or suppositories of the same remedies may be used. In certain cases bleeding or the inhalation of chloroform might be advantageously used.

Stone in the bladder will be removed by crushing or lithotomy ; and in the urethra, extracted by a suitable forceps, or by being cut down upon by perineal section.

* Commer. Liter., Nov. 1731, p. 32.

CHAPTER III.

IRRITABLE BLADDER ; STRANGURY.

Conformably with that property of living textures, which we have termed the law of material correlation, on which normal function essentially depends, and through the operation of which all rational curative efforts must be made, we have seen how its violations are associated with functional or organic derangements of a corresponding nature.

By the term "functional" as applied to departures from health, an imperfection of knowledge is confessedly conveyed, for it is impossible to conceive the slightest somatic disturbance of the normal equilibrium regulating the integrity of the living body without some antecedent molecular cacogenesis, unrecognisable though it be. Perhaps it is not too much to anticipate that the time may come when a genuine scientific advancement in knowledge will render the use of this probationary term purposeless.

Irritable bladder, in the strict signification of the term, comes essentially under the category of functional diseases, and it should be consequently restricted to those states in which the viscus manifests an extreme sensitiveness *to the presence of healthy urine*, in the absence of any recognisable disease of its own structure, or any other organ capable of sympathetically acting upon it. In the course of these remarks, we have ad-

verted sufficiently to the intimate nervous communication between the bladder and the circumjacent organs, and to enumerate the diseases of which irritability of the bladder constitutes a symptom, would be to repeat much of what has already been said, and enumerate, indeed, almost all the diseases of the pelvic viscera.

The most typical variety of irritable bladder is associated with the condition to which the vague term "nervous" is applied; where generally from some mental emotion of a transient nature, hyperæsthesia of the secretory nerves is occasioned. Of this nature is hysteria; in other cases the phenomenon is associated with general debility, neuralgia, and irritation of the brain and spinal marrow, though, when so arising, the condition can hardly be denominated functional, the cause being recognisable.

Nor can it be so considered when it is manifestly due to dyspepsia and the lithic acid, or the oxalic acid diathesis, as the acrid nature of the urine in these states affords palpable explanation; nor can the condition be said to be functional in the very opposite state of the urine, viz., when it is too alkaline, for departures from the normal composition of the urine in either way heightens alike the sensibility of the bladder.

Irritable bladder is a disease, as a rule, of early or middle life, and occurs with equal frequency in both sexes. It is characterised, as the name implies, by frequency of micturition, tenesmus, and a feeling of undefinable uneasiness in the loins and region of the bladder. The health becomes manifestly undermined, the patient becoming weak, emaciated, and irritable; but this applies more particularly to those cases in which organic changes in the viscus are superinduced,

when the urine is generally of a greenish-whey colour, of considerable specific gravity, often serous, and depositing phosphates and lithates, and micturition is attended with scalding pain along the urethra.

The *treatment* of irritable bladder will be based upon the presumed cause. If purely nervous, or associated with neuralgia, nervine tonics are indicated; such as the preparations of iron, of which the tinct. ferri mur. of the Edinburgh Pharmacopœia is to be preferred, also quinine, nux vomica, &c. If the affection be symptomatic of the gouty, and rheumatic, or oxalic acid diathesis, the treatment already referred to will be the most appropriate; while hysteria, irritation of the nervous centres, &c., will demand the special treatment appropriate to them.

Strangury (dysuria difficilis et dolorosica, sæpiens ardens, urinæ immissio—Sauvages) (urinæ parce, guttata, frequens, dolorosa, micturitio—Linnæus) may in like manner be said to be rather a symptom than a disease, though antiquity has prescriptively conferred upon it the right of the latter recognition. It is very accurately described in the brief terms of Sauvages and Linnæus, and it differs mainly from the ordinary forms of enuresis in presenting the symptom of pain, due to a transient irritation of the proximate cause.

Mason Good, true to his *penchant* for minute subdivision, describes no less than the six following varieties of strangury:—

| | | | |
|-------------|---|---|----------------------|
| Spasmodica, | . | . | Spasmodic strangury. |
| Ardens, | . | . | Scalding strangury. |
| Callosa, | . | . | Callous strangury. |
| Mucosa, | . | . | Mucous strangury. |

| | | | |
|--------------|---|---|------------------------|
| Helmenthica, | . | . | Vermiculous strangury. |
| Polyposa, | . | . | Polypous strangury. |

The most cursory glance at the varieties of strangury thus tabulated will suffice to exhibit the fancifulness of its nature, for without spasm and scalding micturition, strangury could not be said to exist ; again the vesical irritability due to stricture, which Mason Good terms callous strangury, has been already explained, and presents no feature to justify its classification under this section ; and of mucous strangury so-called, it must be said that it simply indicates a consequential affection of the bladder, if the cause of the irritation has been sufficiently prolonged.

Strangury differs essentially from the other spasmodic affections of the bladder which we have been considering in this regard, viz., that in strangury, there is a consentaneous, instead of an alternate spasmodic affection of the muscular fibres of the bladder, complicated with the effects of irritation, which, if sufficiently prolonged or repeated, may result in inflammation of the organ.

The vermiculous and polypose strangury of the learned author alluded to, cannot with propriety be considered forms of this affection ; but as the former is both rare and interesting, brief allusion will be made to it immediately.

The most characteristic and frequent form of strangury is that due to the absorption of cantharadin from the application of fly blisters, and its elimination by the urine. It may, in like manner, be occasioned by the internal administration of turpentine and other stimulating diuretics in excessive doses, and also by acrid

articles of diet, and stimulating vegetables, as asparagus, &c.

The treatment of strangury may be considered almost entirely prophylactic. When blisters are applied over a large surface with active absorptive powers, owing to cutaneous tenderness or to anatomical peculiarity, the patient should be made to drink copiously of mucilaginous fluids, by means of which the irritant, if absorbed, is correspondingly diluted, so as to render it proportionately innocuous. Camphor has long been held in high estimation for its efficacy in the treatment of strangury, either given internally, or applied to the skin in conjunction with the blister. The following testimony to its efficacy in the latter respect is given by Percival:—"In three instances blisters sprinkled with camphor were repeatedly applied without strangury, and as uniformly, when the camphor was omitted, with the occurrence of that symptom. I will not say that in all constitutions camphor will obviate strangury, nor in all constitutions will cantharides without camphor produce it."

So painful an affection is strangury, from the absorption of cantharadin, that its avoidance is urgently desiderated: I have seen the agony of such intensity that perspiration flowed copiously from the forehead, the features pinched, and presenting a sardonic expression very significant of suffering. In such cases warm baths, full doses of opium, and copious libations of such mucilaginous drinks as barley water, linseed tea, &c., afford the most relief.

The presence of *worms in the bladder* gives rise to a form of vesical irritation to which allusion has not hitherto been made. In some cases they are discovered

in the organ after death, and in others discharged from the urethra during life. They occur in various forms, sometimes like the larvæ of insects, in other instances of the fluke or gourd variety; and in some cases solitary—an example of the last variety being recorded by Dr Barry of Dublin, in the case of a man, aged fifty, who discharged from his urethra a solitary worm “above an inch in length, of the thickness of the smallest sort of eel, and not unlike it in shape, ending in a sharp-pointed tail.” It was discharged dead, though death had evidently been of recent date. For several years the man suffered from the following symptoms:—He discharged urine frequently, and mingled with blood, although the act was unaccompanied with pain in the urinary canal. His health had become impaired; he was feverish, troubled with anorexia, and his strength diminished. From all these symptoms he recovered on the discharge of the worm.

Mr Lawrence, in the second volume of the “Medico-Chirurgical Transactions,” likewise contributes the following very interesting particulars to the literature of this subject. The patient, a female of twenty-four years of age, had long laboured under symptoms of vesical irritation, which had been pronounced of a calculous nature. Ultimately she discharged three or four worms of a peculiar variety from the urethra; this continued more or less for some time, more especially when their discharge was facilitated by the use of injections, or the retention of the catheter in the bladder during a night. This discharge of worms continued for the period of a year. At one time so many as twenty-two were passed, and altogether not less than from eight hundred to a thousand were thus voided! They varied in size, being

sometimes small, and at other times measuring from four to eight inches in length, and were usually discharged dead. Their presence in the bladder has been accounted for on the supposition that their ova are first introduced into the body with food, and that they transude through the arteries of the bladder, as the white corpuscles of the blood sometimes do.

To the so-called polypous strangury allusion has already been made.

CHAPTER IV.

ON THE PATHOLOGY AND TREATMENT OF NOCTURNAL
ENURESIS AND SPERMATIC INCONTINENCE.

The analogy between nocturnal enuresis, spermatic incontinence, and all other involuntary muscular movements, and epilepsy, will be patent to every one. Normal function essentially consists in a due equilibrium of nervous influence. It acts from two poles, so to speak, the psychical and the somatic ; and when undue elevation or depression occurs on either side, functional or organic changes may be the result. The machinery whereby nervous influence is regulated are the sensory or afferent nerves, and the motor or efferent nerves. Performing functions subsidiary to the former, are the inhibitory nerves, or those which restrain or diminish action, and to the latter the secretory and trophic.

The sensory nerves, under the influence of stimuli, transmit, probably by molecular action, impressions to the central organ, the brain, through the medium of which they are communicated to the motor. In this manner abnormal peripheral irritation may occasion functional disease, quite apart from the local pathological changes it may induce. This may be termed the somatic side of the balance ; on the other hand, the very converse of this may happen through the medium of the mind—the psychical side of the balance.

That the various secretions of the body, and many of the involuntary or muscular movements, are powerfully influenced by mental emotions, is a fundamental principle in physiology. We find examples of this influence in profuse lachrymation from grief, the arrest of the secretion of milk from strong mental impression, the manifestation of blushing, the accelerated action of the heart, or the depression of its action, from diffidence, anger, fear, &c. This law, that of emotional stimulation, as it may be termed, finds expression in the old aphorism, "ubi stimulus, ibi humerorum uberior adfluxus."

Reverting to our subject, the close relationship between the functional aberrations of the genito-urinary system and the brain, and consequently their interdependence, is clearly demonstrated by the distribution of the sympathetic nerve. It is through this nerve in a peculiar manner, that the conditions enumerated influence secretion. As the nerve of common feeling (coenæsthesia, κοινὸς αἰσθησις), and regulator of organic functions, the sympathetic is to a great extent independent of the brain and spinal marrow. Its sensations have been resolved into three separate foci, (*a*) the focus of generation, (*b*) the phrenic focus, and (*c*) the *plexus solaris*.

"The focus of generation forms opposite to the brain, as it were, the other pole of the organisation. The more complete the structures belonging to this focus are developed, the less so is the cerebrum (for the contrary is affirmed of the cerebellum) and conversely."* The phrenic focus regulates the actions of the heart, diaphragm, and the stomach, in conjunction with the

* Feuchtersleben's Psychology.

pneumogastric nerve. The *plexus solaris* is formed by two semi-lunar arcs of the abdominal plexus, and of the superior mesenteric plexus ; it also receives the greater and lesser splanchnic nerves, the termination of the right pneumogastric, and filaments from the right phrenic nerve. From this centre, accompanying the various branches of the aorta as "governors," to carry out our analogy, the sympathetic distributes branches. In addition, therefore, to the diaphragmatic, gastric, hepatic, splenic, supra-renal, renal, mesenteric, and aortic, we have spermatic plexuses. Besides these branches, the pelvic organs derive branches from the lumbar and sacral portions of the parent nerve. Hence there are described the hæmorrhoidal, vesical, prostatic, vaginal, and ovarian plexuses. "By the cœnæsthesia, states of our body are revealed to us, which have their seat in the sphere of vegetative life, wherein the nerves which belong to it spread themselves. These states are (*a*) general : corporeal heaviness and buoyancy, atony, toniety ; (*b*) special : hunger, thirst, sexual instinct," &c.*

Our position, therefore, is as follows : That functional diseases, *i.e.*, aberrations of organic muscular movements, glands, &c., may be due to either psychical or somatic causes, in other words to peripheral or central irritation, or to a combination of both, and that consequently the explanation thereof, and their rational treatment, must be resolved into psychical and somatic.

I am thus a firm believer in the theory which associates hysteria with some disturbance of ovarian, vaginal, or uterine cœnæsthesia. To this impression

* Op. cit.

must be ascribed the abundant secretion of urine so pathognomonic of the Protean malady. While as regards treatment, the influence of a strong mental emotion of a counteracting nature is well known; *e.g.*, the dashing of cold water on the patient occasioning doubtless a feeling of indignation, &c. A familiar illustration of the same influence occurs in the attempt to cure hiccough by creating in the mind of the patient some strong mental emotion, such as some unfounded accusation of a derogatory nature—a psychical counter-irritation is, in short, thus established. With respect to enuresis, the disturbing agency is, in the great majority of instances, of a somatic nature, while in the case of spermatic incontinence, its prototype, it may be either somatic or psychical, or a combination of both. Enuresis more frequently occurs at the periods of infancy and of declining years, and according as it may so occur, it receives a different pathological explanation. In childhood, it is almost invariably due to the irritation of worms, congenital phimosis, calculi, or unusual density and consequent acridity of urine, while in some cases there may be absolutely a superabundant secretion of urine. These causes being removed the normal nervous equilibrium is restored, and the complaint remedied, as a rule. But if the hyperæsthesia has been of long continuation, debility of muscular fibre, or atony may have ensued, and tonic treatment is indicated in addition. In advanced life, the conditions alluded to are generally absent, and the cause of the enuresis is found in diseased prostate, vesical catarrh, atony of the sphincter and bladder generally,—a condition most frequently associated with general muscular atrophy, or affections of the spinal cord.

Of the two sets of muscular fibres of which the bladder is composed, it is a disputed point which set is more immediately under the influence of the will. In the act of micturition, it is only when the detrusor muscles cease to *overpower* the sphincter, that the bladder is closed; and the attempt to explain the occurrence of enuresis by the fact that muscular relaxation occurs during repose, and is participated in by the *sphincter vesicæ*, I look upon as fallacious and untenable. It is indeed a wise provision that it should be otherwise.

But while enuresis in children is in the vast majority of instances due to somatic disturbance, I believe that in some cases a psychical cause is present. That is to say, involuntary discharge of urine may be due to a state of dreaming, in which the necessity of micturition as arising from the normal stimulus is present in the mind. The detrusor muscles are thus brought into action precisely as in voluntary micturition. Desault (now a considerable time since) refers the occurrence of involuntary micturition rather to impaired sensation. Thus, he 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." Though his mode of cure indicates a psychical impression—"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.

Putting out of consideration the causes of enuresis in infancy, it may occur in the adult from yet another cause, viz., debility due to sexual excesses or onanism. The repeated stimuli to the spinal cord and sympathetic being, according to a well-known law of nervous excitability, followed by muscular relaxation—*castus rara minget*. With respect to enlargement of the prostate as a cause of enuresis, Sir Henry Thompson lays much stress on the occurrence of *overflowing* as contradistinguished from incontinence. There can be no doubt that mistakes in diagnosis, and such lamentable results as this authority describes, are frequently due to a non-appreciation of the difference between those conditions; but with every deference to Sir Henry Thompson, I opine that the occurrence of enuresis from atony of the sphincter is not so rare as he seems disposed to promulgate. Incontinence of urine has also been known to occur from the passing of *too large* bougies and catheters, likewise from the gradual dilatation of the female urethra for the removal of stone.

Reverting now to the subject of spermatic incontinence, an affliction which has long proved a potent instrument of imposition in the hands of quacks both *in* and *out* of the profession, it may, parenthetically, be remarked, that as in the case of many other ailments which have been made the stock-in-trade of the impostor, there seems now to be a laudable inclination on the part of legitimate practitioners—an inclination too long delayed—to enter the charnel-house of quackery, and explore in every direction to what extent the superstruc-

ture is based upon truth and reality. It may be submitted as an axiom that to the extent, and in the directions that legitimate practice falls short of the public wants, or fails to satisfy public curiosity or inquiry, to that extent, and in that direction does charlatanism thrive. While on the one hand there is an absolute culpability in permitting imposition while the remedy is at hand—dispassionate discussion and scientific inquiry—there can be no doubt that the fact of any particular disease having been made a means of imposition, exercises a deterrent influence on every honourable mind ; but in proportion to the risks so should be the credit due to him who honestly attempts and succeeds in putting any question in its proper light. As there are few bushels of chaff without their grain of wheat, so there are few systems of quackery in which some basement of truth cannot be discovered. It has been said to the credit of the late Mr Syme, that he beat quacks from diseases of the rectum ; venereal diseases are now fairly in the hands of the profession ; and thus, beaten one by one from their strongholds, the remaining citadel in their possession is alone the one to which the purposely vague term of “nervousness” is applied. To what extent these diseases are in the absolute possession of quacks a glance at the advertising columns of the lowest periodicals, and the experience of city practitioners, amply testify ; while the magnitude and ramifications of the imposition are not sufficiently appreciated. To me it is incomprehensible why functional diseases of the reproductive and urinary organs in the female should merit such exhaustive—perhaps too exhaustive consideration—while corresponding diseases in the male have received nothing like relative exposition. There

are few more painful exhibitions in medical theory and practice than the ephemeral outbursts of enthusiasm with which every new remedy or doctrine is universally greeted. The discoverer is one of a very numerous family now-a-days, and his elevation to a giddy height, amid the inane plaudits of the silly multitude, is the matter of a very brief time. This human infirmity—mental oscillation—manifests itself in the following forms:—From a state of doubt is produced universal belief, from neglect over solicitude, and ultimately a reaction of equally general scepticism. It is permitted only to those who can survive the opposing conflict of these currents to be able to appreciate the unimpassioned deductions of truth.

These remarks are made particularly in view of a series of editorial articles, in "The Lancet" for 1870, to whose appearance the writer at least contributed, and which have evidently, in turn, called forth one or two small publications in which this subject is either grossly exaggerated, or treated in a most perfunctory manner. Of this, however, more in the sequel.

While spermorrhagia (to coin a convenient term)* presents in many respects striking analogies to enuresis, it differs in some essential, and pathologically, and physiologically speaking, important respects. In the former case we have to deal with a functional aberration of a glandular secretory apparatus (excito-motor), in the latter simply with a muscular derangement of the reservoir of the urine. Seminal emission is a reflex act, and not immediately under the influence of the

* I would suggest that the term spermatorrhœa be at once and for ever expunged from medical literature. Besides being a misnomer, it has an abominable ring. Spermorrhagia more aptly expresses the meaning of the term which should be employed.

will ; expulsion of urine, as we have seen, bears a different relation to volition.

It is in the cases of enuresis in which the sphincter is at fault that these complaints can be more appropriately compared. The *sphincter vesicæ* is, equally with the muscular fibres of the vasa deferentia and vesiculæ, and the accessory muscles, an involuntary muscle. But again, while the act of micturition depends on the quantity of urine secreted, so also must seminal emission depend on the normal function of the testicles ; and it is thus only by a correct appreciation of the function of the testicles in health, as in the case of all other organs, that we can pronounce where health ends and disease begins. This essential preliminary investigation it devolves upon us, as briefly as possible, to consider.

The organs by which the seminal fluid is secreted are the testicles, the vesiculæ seminales, the prostate, and Cowper's glands, each organ contributing its quota to the perfect semen. At the threshold of this part of our subject the following questions present themselves. Do the testicles continually secrete semen, as other glands constantly elaborate their peculiar secretions ? Can the discharge of the peculiar secretion of the vesiculæ seminales, the prostate, and Cowper's glands take place independently of one another ? Are the vesiculæ seminales merely the reservoirs of the seminal fluid ?

DO THE TESTICLES CONSTANTLY SECRETE SEMEN ? Judging from analogy, no one would hesitate to answer this question in the affirmative ; but, like many other secretions, that of semen is regulated by certain conditions, so far as the rapidity and quantity of the secretion are concerned. It is the opinion of Kirkes

that "the seminal fluid is probably after the period of puberty secreted constantly, though, *except under excitement*, very slowly, in the tubules of the testicles. From these it passes along the vasa deferentia into the *vesiculæ seminales*, whence, if not expelled in emission, it may be discharged, as slowly as it enters them, either *with the urine*, which may remove minute quantities mingled with the mucus of the bladder and the secretion of the prostate, or from the urethra in the act of defæcation." To the proposition that the secretion of semen is influenced by mental excitement I assent; from the assertion that *in health* semen is removed from the *vesiculæ seminales* during the defæcation, or micturition, I unhesitatingly differ. To this we shall revert in the proper time and place. Assuming in the mean time, what the present state of our knowledge on the subject justifies us in doing, that seminal fluid is constantly secreted, subject to variation from certain mental and physical conditions, one of three things it follows must happen; it must be *excreted* from the system in the form of an involuntary emission, be discharged with the urine with certain effete elements of tissue, or it must be reabsorbed into the system. It will be remarked in the above quotation from Kirkes, that he supports the generally received opinion that the *vesiculæ seminales* act as *reservoirs*.

Further, this physiologist remarks, "The seminal fluid secreted by the testicle is one of those secretions in which a process of development is combined after its formation by the secreting cells, and its discharge from them into the tubes. The principal part of this development consists in the formation of the peculiar bodies named *spermatozoids*, *seminal filaments*, or sper-

matozoa, the complete development of which in their full proportion of number is not achieved till the semen has reached the vesiculæ seminales. Earlier, after its first secretion, the semen contains none of these bodies, but granules, and round corpuscles, like large nuclei, enclosed within parent cells. To the vesiculæ seminales a double function may be assigned; for they both secrete some fluid to be added to that of the testicles, and serve as reservoirs for the seminal fluid. The former is their most constant and probably most important office; for in the horse, bear, and guinea pig, and several animals in which the vesiculæ seminales are large and of apparently active function, they do not communicate with the vasa deferentia, but pour their secretion separately, though it may be simultaneously, into the urethra. In man also when one testicle is lost, the corresponding vesicula seminalis suffers no atrophy, though its function as a reservoir is abrogated. But how the vesiculæ seminales act as secreting organs is unknown; the peculiar brownish fluid which they contain after death does not properly represent their secretion, for it is different in appearance from anything discharged during life, and is mixed with semen. It is nearly certain, however, that this secretion contributes to the proper composition of the impregnating fluid; for in all animals in which they exist, and in which the generative functions are exercised at only one season of the year, the vesiculæ seminales, whether they communicate with the vasa deferentia or not, enlarge commensurately with the testicles at the approach of that season. That the vesiculæ are also reservoirs in which the seminal fluid may lie for a time previous to its discharge is shown

by their commonly containing the seminal filaments in larger abundance than any portion of the seminal ducts themselves do. The fluid-like mucus also which is discharged from the vesiculæ in straining during defæcation commonly contains seminal filaments." While the foregoing views express pretty accurately the most generally received opinions on the points at issue, are more in accordance with the physiological functions of other organs, and the manifest purposes of adaptation, inasmuch as in animals which have no vesiculæ seminales a dilatation of the vas deferens fulfils the same object, different views have been entertained by Hunter, Bransby Cooper, and, following them, by writers in our own time. Thus the question stands. Let us examine the evidence for and against the views that the vesiculæ seminales are reservoirs of semen, for the inquiry has a highly important practical bearing. Against the opinion that the vesiculæ act as reservoirs for the seminal fluid it is urged that, even in castrated persons the vesiculæ seminales are full, and Mr Milton considers the fact of his having examined the body of a pauper, eighty-four years old, and having found the seminal vesicles "as full of fluid as in a young person," when the testicles, as he thinks, must long have ceased to secrete, likewise fatal to this view. To my mind, the finding of a fluid in the vesiculæ of castrated persons simply shows that, independent of the testicles, the vesiculæ continue to secrete their own secretion; again, it is *not* a fact that the testicles cease to secrete semen even at the advanced age of eighty-four, and if Mr Milton assumes, solely on account of the advanced age, that the contents of the vesiculæ in this case were *not* seminal, the assumption is unwarrantable, for Casper

relates the case of an invalid,* aged *ninety-six*, who died under the care of a trustworthy observer, Dr Abel, who had the remarkable opportunity of observing a *number* of spermatozoa in the vesicles. Hence the finding of fluid in the vesiculæ at any age *under* ninety-six cannot invalidate the opinion that the vesiculæ act as seminal receptacles.† To show that at very advanced ages the testicles secrete semen, the following cases, likewise related by Casper, may be mentioned:—A carriage varnisher, aged sixty-five, who killed himself by slitting up his belly, had *numerous* zoosperms in his vesicles. An invalid, aged sixty-eight, whose death was occasioned by fracture of the pelvis, had a large number of zoosperms in his vesicles. Case seven may be quoted in Casper's own words, "A vigorous naturalist, *sixty years of age*, a married man, and father of a large family, and accustomed to the use of the microscope, whom I had interested in this question, examined with me for some time continuously his own semen after coitus. Here we found *the greatest variations*, which were accurately noted by both of us together. After coitus on the third day, reckoning from the last performance of the act, there was a *large number* of very *small* spermatozoa; after renewed coitus on the fourth day, *few* and *small*; after a pause of only two days, *none*; after a pause of only one day there was only a watery sperma, in which no zoosperms were found. At another time, on the fifth day after the last coitus, the zoosperms were very numerous; another time, after a pause of six days, they were *few* but *large in size*; four months after the last examina-

* Valentin's Physiology.

† Duplay found that the semen contained spermatozoa in thirty-seven cases out of fifty-one old men, nine of whom were more than eighty years old.

tion, and seventy-two hours after the last act, the zoosperms were *comparatively* very small; and at another time, on the third day after the last act, they were innumerable. Immediately after coitus, and before emptying the bladder, the urethra was twice examined. Twenty-four hours after the last act, a drop pressed out of the urethra exhibited *numerous small* zoosperms; at another time, after a three days' interval, there was not a single zoosperm." It may be contended against Casper's cases that the individuals examined were in a most favourable state for *post mortem* ejaculation, an occurrence not unfrequent even after natural death, for with the exception of two subjects, dead the one from pyæmia, the other from pneumonia, the others were asphyxiated, hanged, or drowned; circumstances under which ejaculation is nearly constant. Casper further relates thirteen cases in which zoosperms were found in the vesiculæ, but as they possess no peculiar interest, I shall content myself with referring to the original work; but he also relates eleven cases in which no zoosperms were found in the vesiculæ, and the conclusion at which he arrives is that "these observations prove, not only that the human seminal fluid does not always contain spermatozoa, but also, that even in the same individual they are not always to be found. Whether, as it seems, long illness or excess *in venere* has an influence upon the origin and reproduction of these animalculæ, must remain for future and more extended observations to decide."

The important observations of Dr Davy, F.R.S., Assistant-Inspector of Army Hospitals, published in the "Edinburgh Medical and Surgical Journal" for 1838 confirm these views, and an outline of the cases examined may be presented as follows:—

ANALYSIS OF DR DAVY'S CASES.

| No. | Age. | Disease. | Hours after death Examined | Condition of the Vesiculæ Seminales. | Condition of the Vasa Deferentia. |
|-----|------|---|----------------------------|--|---|
| 1 | 30 | { Pulmonary Tuberculosis, &c. } | 6 | { Contained a considerable quantity of fluid abounding in spermatic animalcules. } | { About a drop of fluid in each vas deferens. Contained numerous animalcules, some in active motion. } |
| 2 | 57 | Cerebral Disease. | 57 | { Fluid small in quantity; browner than in duct, and contained abundant vestiges of spermatic animalcules. } | { A minute portion of fluid; colour and appearance of pus. Contained very many spermatic animalcules, all dead. } |
| 3 | 39 | Pulmonary Consumption. | 6 | { Contents small in quantity, and gelatinous. No spermatozoa. } | { Fluids in ducts more liquid. No spermatic animalcules. } |
| 4 | 20 | Pulmonary Consumption. | 11 | { Small quantity of fluid, brownish, fragments of spermatozoa. } | { Contents extremely minute—thin, like starch; fragments of spermatozoa. } |
| 5 | 32 | { Latent Pulmonary Consumption. } | 16 | { Turgid. Fluid opaque. Abounded in animalcules. } | { Fluid purulent-like in appearance. Abounded in animalcules—in both dead. } |
| 6 | 39 | Gangrene of Lung, &c. | 2 | { The vesiculæ shrunk. Little fluid. No animalcules. } | { Fluid like pure purulent matter—no smell. Contained minute globules. No spermatozoa. } |
| 7 | 42 | { Pulmonary Consumption, diseased prostate, testes, &c. } | 37 | { Moderately distended with fluid, of a light brownish hue, turbid and opaque. Full of animalcules. } | { Fluid like that in vesiculæ. Contained a few animalcules, many blood corpuscles, and some smaller particles. } |
| 8 | 32 | Bronchitis, &c. | 32 | { Moderately distended with purulent like fluid, abounding in seminal animalcules. } | { Contained a few animalcules, and many particles smaller than those of blood. } |
| 9 | 33 | Pulmonary Consumption. | 15 | { Fluid of a brownish hue, and semi-opaque. Abounding in animalcules. } | { Fluid like diluted purulent matter. Contained a few seminal animalcules and minute globular particles. } |
| 10 | 20 | Pulmonary Consumption. | 4 | { Small quantity of fluid, thin, like starch. Contained many animalcules. Brownish colour. } | { Fluid thin. Contained but one animalcule—debris of others. } |
| 11 | 27 | Pulmonary Consumption. | 10 | { Thin fluid; no spermatic animalcules—brownish hue. } | { Very little fluid; no animalcules. } |
| 12 | 33 | Inflammation of Neck, &c. | 26 | { (Little hair on pubis or chin— <i>partes naturales</i> were all small—had always shown an aversion to the female sex.) } | { Minute portion of fluid; no spermatozoa. Contained small particles, and a few large globules. } |
| 13 | 29 | { Pulmonary Consumption, &c. } | 27 | { Contained very little fluid, thick, gelatinous, nearly transparent, and colourless. No spermatozoa. } | { No fluid; testes natural size. } |
| 14 | 27 | Pulmonary Consumption. | 32 | { Moderately distended with fluid of just a perceptibly brownish hue—small number of animalcules. } | { Less than a drop of fluid. Contained a few animalcules. } |
| 15 | 27 | Pleuritis and Pneumonia. | 36 & 12 | { Pretty much fluid, brownish, and of a gelatinous consistence; very many animalcules. } | { Very minute portion of fluid; no distinctly formed spermatozoa. Some globules and fragments of a peculiar entozoa. } |
| 16 | 33 | { Complicated organic disease of bones, &c. } | 36 & 6 | { No animalcules; merely globules of different sizes. Slightish brown fluid. } | { Very little fluid—numerous minute globules—no animalcules. } |
| 17 | 31 | Pulmonary Consumption. | 27 | { Distended with fluid, brownish tint—abounded in animalcules and globules. } | { A drop of fluid procured from each vas deferens. No animalcules, but globules of different sizes, some resembling fragments of animalcules. } |
| 18 | 49 | Meningitis. | 17 & 10 | { Fluid in vesiculæ abounded in dead animalcules—brownish tint. } | { Fluid abounded in animalcules—some alive and in languid motion. } |
| 19 | 30 | Consumption. | 22 | { One vesicula little fluid—other much: brownish; large number of animalcules, and some globules. } | { Minute quantity of fluid; some globules and particles—no animalcules. } |
| 20 | 41 | Aneurism. | 38 & 58 | { Fluid of a greyish hue—abounded in animalcules. } | { A drop of fluid—no animalcules; very many minute particles. } |

In all these cases Dr Davy states that the testes were examined, along with their associated organs, and that, except in the 18th and 20th cases, no animalcules could be discovered in the fluid expressed from the substance of the gland. When obtained in sufficient quantity for accurate observation the fluid secured was transparent, generally contained globules about the size of blood corpuscles, and invariably dense particles, from twelve to fifteen times smaller than the globules, and which, it has been surmised, are the ova of the spermatic entozoa. In the two instances Dr Davy remarks, in which spermatic animalcules were found in the fluid of the tubuli, the quantity of the fluid was greater than in the others. From this table Dr Davy justly draws the inferences that the *vesiculæ* are seminal reservoirs, but that they also secrete a peculiar fluid of their own for admixture with the semen. The first inference is supported by the general resemblance, in several cases, of the fluid in the vasa deferentia and the vesiculæ, and of the existence of the characteristic spermatic animalcules in the fluid of the vesiculæ in every instance in which they were detected in the fluid of the vasa deferentia. The second inference is supported by there being a certain difference in almost every case between the fluid of the vesiculæ and that of the vasa deferentia, and especially by the circumstance that the difference of the quality is most perceptible in the fluid of the fundus,—being most out of the way of being readily mixed with the fluid of the testes. The fluid in the vesiculæ, Dr Davy thinks, will be found more dilute than that in the vasa deferentia. With respect to the colour of the fluid in the vesiculæ, Hunter was of opinion that it was naturally

of a brownish hue. This appears questionable; and Dr Davy is disposed to think that coloration is a *post mortem* effect, as the fluid partakes less of this hue the sooner it is examined after death. In Dr Davy's cases, instances occurred in which it was colourless; and Hunter himself, relating his examination of the vesiculæ of two men suddenly deprived of life, the one killed by a cannon ball, the other by falling from a height, remarks that in the former "the fluid in the vasa deferentia was of a lighter colour than is usually found in men who have been dead a considerable time; but it was by no means like the semen either in colour or smell." With respect to the latter, he remarks, "I inspected the body soon after the accident, and found the contents of the vesiculæ of a lightish whey-colour, having nothing of the smell of semen, and in so fluid a state as to run out on cutting into them."*

When examined shortly after death the spermatozoa were found alive; a few hours afterwards they were motionless, and heat had no effect in restoring them. Exposed to the air they soon became putrid, while in other cases distinct remains of them were observed after ten weeks, though kept at a temperature varying from 50° to 60° Fahrenheit.

Dr Davy looks upon the vesiculæ as performing a purpose similar to the gall bladder in the case of bile, and the urinary bladder for that of urine. He believes that in health semen is constantly secreted, and to pass as it is formed into its *reservoir*, from which in

* Observations on Certain Parts of the Animal Economy, 1786, page 28; *vide* also, Manuel d'Anatomie Générale, Descriptive, et Pathologique. Par J. F. Meckel, traduit par A. Jourdan et G. Buschet, tom. iii. p. 643.

continent persons it is voided during defæcation, or in part absorbed. Dr Davy further remarks, "Mr Hunter, in accordance with the opinion which he had formed of the use of the vesiculæ, did not admit this. He believed that the fluid rather accumulated in the testes, and gave rise there to annoyance, requiring its evacuation by a disturbing act—a dangerous doctrine, and one for which there is, to modern science, no sufficient evidence. In opposition to the doctrine of Hunter, I may further state, that I have frequently examined microscopically the fluid from the urethra, following the alvine evacuations, and I have always found it, in a healthy person, abounding in animalcules, the majority of which have always been dead; and thus, perhaps, seeming to indicate that the vesiculæ are *cloacæ* as well as *reservoirs*, and are essentially designed for man to enable him to control and to exercise that moral check on the passions by which he should be distinguished from brute animals, and without which no considerable advance can be made in civilisation or in elevation of individual condition and character."

What then are the additional inferences that may be deduced with reference to the functions of the vesiculæ? We have seen that in arriving at any conclusion regarding them the factor of age up to ninety-six must be dismissed.* Does the presence of spermatozoa in the

* If more ancient authority can be relied upon, Pliny relates that Massinissa had a son born to him after he was eighty-six years of age, and Cato, the Roman senator, one at the age of eighty. Savonarola asserts that Nicholas de Pelavicinis had a son in his hundredth year. Alexander Benedictus knew a German who had one in his ninetieth year; and Lemnius mentions another, who, at the age of an hundred, married a woman of thirty by whom he had a numerous offspring. Felix Platerus, a celebrated physician, who died at

fluid prove it to be seminal? Then seminal fluid has been found in the vesiculæ in the majority of Casper's cases. Does the *absence* of spermatozoa in the fluid found in the vesiculæ show that the fluid is *not* seminal? It does not. Then surely Casper's and Davy's cases prove conclusively that the vesiculæ seminales act as seminal *reservoirs*. Casper's case 7 further shows, what will be very generally conceded, that venereal excesses diminish the consistency of the semen—render it more fluid; that the seminal fluid requires time for its perfect maturation, and, consequently, that repeated coitus both diminishes the number of spermatozoa and prevents their normal growth; for as sexual congress was frequent the spermatozoa were smaller,* till ultimately the fluid ejaculated was reduced to a watery sperma with *no* zoosperms. From perfectly matured semen the gradation proceeds through watery sperma, which I take simply to be the secretion of the vesiculæ and prostate, till at length, if coitus be sufficiently frequent, no discharge at all takes place. These circumstances surely indicate that the vesiculæ act as reservoirs.

But we have proposed for consideration another question of much practical importance, *Can the peculiar secretion of the prostate, Cowper's glands, and the resi-*

Basle in 1614, records that his father married at seventy-two years of age, and had six sons; at eighty-two years of age his wife bore him a daughter. Dr M—— of P—— has just informed me to-day, August 9, 1871, that his grand-uncle, Capt. ——, married at the age of ninety-six; that he lived for ten years afterwards, and had a family of four by his wife. And old Parr possessed sexual capacity at 140 years of age! According to Palmorius, he was tried for his life at the age of one hundred, *ob vim illatam virgini*.

* The dense particles referred to by Dr Davy, as being found in the fluid of the testes, are probably formed into perfect spermatozoa in the vesiculæ. After repeated coitus the secretion from the vesiculæ alone may be ejaculated.

culæ occur independently of one another, or of the secretion of the testicle?

So far as the secretion of the testicle is considered, castration will decide the question. The possession of testicles, or indeed, a testicle, presumes procreative power, and the absence of both would be necessarily presumptive of impotency; but procreative ability must not be inferred from the fact that the power of gratifying sexual desire exists, even though the act be attended with ejaculation. Thus Sir Astley Cooper relates the case of a man in whom the testicles had been extirpated for twenty-nine years. For the first twelve months he was capable of sexual congress, and had ejaculations, or at least the same feeling as if these had occurred. Subsequently his erections became less frequent, and the act of coition was unattended with the feeling of ejaculation. Ten years after the performance of the operation he told Sir Astley that during the past year he had only on one occasion had sexual intercourse. Twenty-eight years afterwards he had imperfect erections. Sexual desire gradually diminished, but on rare occasions he indulged in sexual intercourse, but without result, and only once or twice he had libidinous dreams, without any ejaculation. Krahmer relates a confirmatory case, that of a young man, twenty-two years of age, who cut off his testicles and epididymis with a razor. Between the eleventh and twelfth day he had an involuntary *seminal* emission. During eighteen years afterwards the sexual power had entirely ceased. Dr L. Gosselin has published in the "Archives Générales de Médecine," for September 1853, the result of experiments upon animals for the determination of this point, and of the observation of

nineteen patients suffering from double induration of the epididymis following gonorrhœa. The spermatic cord of one side being exposed in two dogs, the vas deferens was detached from the other portions of the cord and a portion of it excised. After several months the animals were killed, and examination disclosed the testicles subjected to the experiment in all respects normal, and differing from that of the opposite testicle in that the convolutions of the epididymis of the former were distended with fluid containing abundance of spermatozoa. The isolation of the testicle, therefore, in dogs at all events, does not interfere with the nutrition of the testicle or its power of secreting semen. Of the nineteen cases in the human subject under the care of Gosselin, some occurred in private, and the rest at the Hôpital du Midi. The period of induration to that of observation by Dr Gosselin extended from a few weeks to ten years. In all of them the induration was seated at the lower portion of the epididymis. There was no variation from the normal state in size, nor tenderness on pressure; none of them had their sexual powers impaired, and there was complete ejaculation unattended with pain. The semen seemed normal, but subjected to microscopical examination it *was found to be entirely destitute of spermatozoa*. The accuracy of the microscopic examination was confirmed by Robin, Verneuil, and others. In two of the cases, treatment being continued, resolution of the induration took place, in one in three, in the other in nine months, and coincidentally spermatozoa were found in the urine.

The inference is therefore inevitable, that while the testicles secrete the fecundating portion of the semen,

the accessory organs, the prostate, vesiculæ, and Cowper's glands likewise secrete a portion of perfect semen, and that their contents may be discharged independently of the testicular portion of the semen. Gosselin concludes that to the portion of the semen derived from the latter organs is due the colour, smell, and other chemical peculiarities, and this opinion is confirmed, as we shall presently see, by Dr Kraus, editor of the "Vienna Medical Times." M. Godard has confirmed Gosselin's observations in more than thirty cases of double epididymitis. In every instance spermatozoa were absent.

Venereal excesses diminish the quantity of spermatozoa. Thus M. Liegéois of the Hôpital du Midi, Paris, relates the following case:—"A student, after having had three to four connections daily for ten successive days, asked me to examine his semen. Out of seven or eight preparations which I made I could not discover any spermatozoa. There existed no lesion of the testicle. Some months later the same person brought me a new sample of spermatic fluid, but this time after three weeks of sexual abstinence. I then found spermatozoa in enormous quantity, covering nearly the whole field of the instrument." And it is suggested by M. Liegéois that the cases of idiopathic aspermatozie mentioned by Hirtz are explainable on the ground of sexual excesses. Hence it is inferred that infecundity is due to excesses, and moderation of the conjugal relations is enjoined for the begetting of offspring.

We are not even authorised to affirm that the presence of spermatozoa in the semen implies the power of procreation, for these spermatozoa must be endowed with motion, and even if endowed with motion, an ab-

normal molecular arrangement may destroy the fecundating property of the semen.

It is not so easy to determine whether the secretion of the prostate can be discharged independently of that of Cowper's glands, and the vesiculæ, or *vice versa*. This must necessarily be conjectural, as on account of the anatomical relationships the one cannot be separated from the other. I incline to think, however, that the prostatic fluid is at times separately discharged, and this brings us to consider the nature of the fluid discharged at stool, when the bowels are costive, and during relaxed states of the body generally. The argument that it is not seminal when spermatozoa cannot be discovered in it, we have seen to be valueless. In supporting the assertion that it is not semen, John Hunter contended that it is not of the same colour.* What is the value of this argument? Gosselin believes that the semen owes its colour, odour, and chemical reactions to the vesiculæ, and his cases fully warrant this belief. More recently, Kraus of Vienna, to whom we have already referred as corroborating these opinions, asserts, that seminal fluid, as long as it remains within the testes, vesiculæ, and other seminal passages, is colourless and scentless, being in appearance exactly like fresh honey while deposited in the comb; and in its reactions it is neutral. Only when it has quitted

* Herodotus (Thalia, c. 101), makes a curious statement. Referring to a tribe of Indians called Padæi, he observes:—"The communication between the sexes is like that of the beasts, open and unrestrained. They are all of the same complexion, and much resembling the Ethiopians. The semen which their males emit is not, like that of other men, white, but black like their bodies, which is also the case with the Ethiopians!"

Semen si probe concoctum fuerit, colore album et splendens esse oportet, ut vel hinc pateat quam parum vere Herodotus scribat semen nigrum Ethiopes promere. (Rodericus a Castro de universa mulierum medicina.)

the passages and arrived in the urethra does it acquire its white colour, and its peculiar faint smell. Dr Kraus further adds, that it is during its passage through the prostatic portion of the urethra that the secretion of this gland imparts its white colour to the semen, and confers upon it the property of coagulating when exposed to the air (alkaline reaction). Semen taken from the seminal vesicles does not coagulate, but remains clear, colourless, and scentless. He makes the following interesting observation in addition to the foregoing,—that the spermatozoa, in the absence of the prostatic fluid, cannot live in the mucous membrane of the uterus of the mammalia; but with its aid they may live a long time in the uterine mucus, often more than thirty-six hours. While a slight discrepancy will be noticed between the views of these two observers, it will be conceded that John Hunter's argument must be abandoned. But further, it is denied that this fluid is seminal, because it produces no ejaculatory sensation in passing along the urethra. To this it is simply necessary to reply, that there is surely a vast difference between the mechanical extrusion of a fluid through a glandular body, and the physiological effects of reflex action. This argument must also fall to the ground.

What, then, is this fluid? Is it seminal? While these arguments do *not* prove that it is not seminal, I am satisfied that while it may in some cases *be* seminal, in the great majority of instances it is *not* so; and my belief is based upon microscopical examination and general considerations. A person passing semen at stool would *à priori* be expected to present appearances of debilitated health. I have been consulted in many cases where the general vigour and appearance

of the patient negatived the idea of any such drain upon the system. The explanation I believe in these cases to be the pressure of faecal accumulation against the prostate gland, and the consequent extrusion of *its* secretion. A glance at the relative anatomical position of the parts will corroborate this belief. The situation at which accumulation of faeces in the rectum will press with greatest force antero-posteriorly, is at a point corresponding to a line drawn between the prostate gland and tip of the coccyx. Higher up, the capacity of the pelvis is greater; the vesiculæ are placed as it might seem designedly on either side of the base of the bladder, and thus removed from the ordinary contents of the bowels. That the faeces do so press is demonstrated by the fact that when the bowels are costive, and during defæcation, the bladder full, the flow of urine is temporarily arrested by the pressure, from behind, on the prostatic portion of the urethra. Again, the fluid thus discharged is much thinner than normal seminal fluid. While, therefore, it is my conviction that *in the majority of instances* this discharge—the source of much uneasiness to patients—is from the prostate, I am bound to conclude that facts are wanting to prove that involuntary seminal emission may *not so* occur.

Referring to this portion of our subject, Mr Benjamin Philips, F.R.S., observes:—"At one time I doubted whether this fluid were spermatic, it is usually so smooth, transparent, and homogeneous; but if it be examined under the microscope, spermatozoa can usually be observed in it. Its thin fluid character has induced people to think that it was a depraved secretion become watery by exhaustion of the secretory

organ; and sometimes it may be so, for if a person who complains of the constant escape of the thinner fluid has an ejaculation, the fluid will be thick and grumous. It is, therefore, most probable that the more fluid portion of the secretion which fills the seminal vesicles is most easily pressed out; and this is a reasonable explanation of this feature of seminal discharges."*

The occurrence of any such discharge, while easily remedied, is not to be considered a manifestation of health.

In conformity with our plan, the next question which presents itself is, *Is semen discharged with the urine in health?*—to which the brief answer may be made, *assuredly not*. Neubauer and Vogel show that spermatozoa are found in the urine after coitus, and that they have been frequently noticed in the urine of patients suffering from typhus, and they detail their mode of examination and the influence of certain forms of urine on the behaviour of the spermatozoa. Lehmann remarks that urine containing spermatozoa very soon becomes alkaline.

Clemens has frequently noticed the passing away with the urine of imperfectly formed semen; the spermatozoa lying in the cells, and adhering by their head and tail to the envelope; the tails seldom showed any signs of motion, which only takes place in perfectly formed semen. Besides these spermatocells, Clemens often observed in the urine of patients suffering from spermatorrhœa roundish cells of 0.0033 to 0.005" diameter, filled with fine granules, which lay for the most part on the side of the cell. These cells are in reality

* Med. Gazette, 1845

the mother cells of the spermatozoa. Such elementary bodies are generally found in the last drop of the urine of patients who have been much depressed by loss of semen, and also in typhus fever patients—*Canstatt's Jahresbericht* 1860, p. 285.

Is semen re-absorbed into the system? In a very able review of M. Lallemand's well known and mischievous work on "Spermatic Discharges," in the first number of the *Medico-Chirurgical Review* (1848), the following passage occurs:—"M. Lallemand, in our opinion, attributes far too great an importance to prolonged *continence* as a direct cause of spermatorrhœa. That a moderate exercise of the genital organs is the condition most favourable to the maintenance of their healthy condition, and the general well-being of the economy, is a fact which requires no proof; but we conceive that M. Lallemand greatly exaggerates the ill consequences which ensue upon the withholding such exercise. In the first place, the condition of spermatic plethora, or distension of the vesiculæ, is not such a necessary consequence as he states it to be, and may be said to be in a great degree under the control of the individual. Even if the secretion of semen is of constant occurrence, *the amount is much influenced* [the italics are mine] by the mental state operating through the nervous system, and by the demand made upon the gland. Thus, if an individual has frequent recourse to coitus, or without this, indulges in erotic thoughts, libidinous reading and conversation, or analagous practices, a large quantity of semen will be secreted; and in the latter case, not finding a natural ejection, it may lay the foundation of obstinate nocturnal pollution. This, indeed, may occur

in any person without prior excitement of sensual ideas ; but then it is usually both rare and moderate. And indeed the testicles and their secretion seem to possess a far greater power of accommodation to the exigencies of the economy than M. Lallemand is disposed to allow ; and we imagine the instances of atrophy from mere disuse, unaccompanied by prior disease, to be of very rare occurrence. Certain it is, that many men, who have maintained a complete continence long after full manhood, have yet proved effective progenitors of children ; while the number of cases of premature impotence, brought on by too early or excessive intercourse, would lead us to suspect that this is the more formidable of the two." To these opinions we give our unqualified adherence, believing as we do, that they accord with sound physiology and everyday observation, as we shall in the sequel more fully endeavour to show.

But to the point more immediately under consideration—the reabsorption, or the non-reabsorption of semen. M. Gosselin is of those who believe in the reabsorption. He says—"All physiologists acknowledge, that of all the secreted fluids, semen most easily admits of absorption. In fact, in the best organised subjects, its excretion is neither continuous or regular. It is true that the vesiculæ are organs of reception ; but their capacity is small, and their power of distension slight. Now, if these organs do not admit of a large accumulation of the fluid, and yet, on the other hand, nothing arrests or suspends its secretion, it is by means of a gradual and proportionate absorption that nature supplies this apparent deficiency in the anatomical arrangements.

Need I allude to the fact that such absorption of semen is regarded by all physiologists as of utility for the regular maintenance of our organs, and the exercise of all our functions. (*Sic !!*). Observe what takes place when the testes is absent, disappears, or is imperfectly developed. The semen is then absorbed in insufficient quantity, and all the organism suffers from this; the constitution continues feeble, while the body does not take on, or loses a portion of its masculine characters. Nature endeavours to provide for the regular conservation of the individual, by means of the absorption of the same products where excretion serves for the preservation of the species. When an obliteration takes place, the latter and most capital of these uses is suspended; but the other persists, the absorption of the semen throughout the spermatic passages prevents a distension of parts which might end in local mischief, while the beneficial influence of the secreted semen is imparted to the entire economy." It is by such arguments as these, plausible no doubt, that Gosselin, Haller, and others, support their view.

It seems, however, *a reductio ad absurdum* when the view is pushed to the following extent:—"The greater part of the semen—that which is the most valuable, and the strongest smelling, that which has most force—is pumped back again into the blood, and there produces, as soon as it reaches the circulation, changes the most marvellous—the beard, the hair, the horn; it changes the voice and the manners; for age does not produce these changes in animals, it is the seminal fluid alone which can effect this. As we never remark these changes in eunuchs" (Haller), "the seminal fluid is not an excrementitious secretion like the urine. It

was never intended that all this fluid should be discharged from the system. In health, a portion is re-absorbed and taken back into the blood, which imparts that sprightliness and intelligence, that power of voice, that manliness of countenance, and that dignity of manner, and bestows that arduous and noble bearing which brave and intelligent men possess.”*

Now, unfortunately for such arguments, it is not at all unfrequent to meet with females with beard in greater abundance than they are at all proud of; and how, in the absence of seminal reabsorption, or, indeed, reabsorption of any analagous secretion, they should possess “sprightliness,” “intelligence,” and “dignity of manner,” we are left to conjecture. The argument is too absurd to merit lengthened or serious consideration; and it is a pernicious one to teach, as it is susceptible of being adroitly treated by the quack, for the basest of purposes.

Kölliker, on the other hand, contends that “There are no certain facts in favour of an absorption of semen when formed, which could only take place in the *vasa deferentia* and *vesiculæ seminales*; for what is observed in animals after the rutting season is over has no reference to this point; and the very circumstance that in the situations above mentioned, no traces of a disintegration of semen are ever found, appears to be very much opposed to such a supposition. At the same time, however, it is perhaps unquestionable that, without seminal evacuations, a formation of semen may be possible; for it is sufficiently established that a rich heating diet, and an unsatisfied sexual excitement, often produce a turgescence of these organs, attended with

† Dawson on Spermatorrhœa.

painful sensations, and most probably with the formation of semen. The subsequent removal of this fulness does not, however, appear to me incontestably to prove any absorption; because a difference in the quantity of blood in the testes, and the passing of the semen into the vasa deferentia, are sufficient to account for the restoration of the usual condition."

In some able papers by Dr Hake of Brighton, in the "Lancet" for 1835, on Absorption, he gives his opinion of the subject at issue, in the following words:—"Semen and other secretions belonging to an open cavity are no more reabsorbed than bile, and the healthy action supposed to be induced in the system from continence, besides other causes, results from a metastasis of the action of the stimulus to the other organs, which invigorates them to a degree equal to that which the presence of the fluid itself could effect."

Before quitting this part of our subject there is yet another argument in favour of the reabsorption of semen which demands notice, the effect of castration on animals, and the difference in point of vigour between the castrated and non-castrated animals.

Mr Acton remarks that "the vigour of the uncastrated animal must depend upon the testicles secreting semen,—that is, taking its element from the blood. This semen is slowly secreted by the testes, and passes slowly along the vasa deferentia towards their terminations, which are dilated, and some passes into the vesiculæ seminales; there, and along the course of the vasa deferentia, absorption probably takes place, if at all." There seems to me to be an apparent paradox in Mr Acton's argument. The effect of castration on the system, according to Mr Acton, leads to the inference

that semen is reabsorbed, and the vigour of the uncastrated animal must depend on the testes taking the elements of semen from the blood. If the latter proposition be true, it follows that in a direct ratio to amount of semen removed so will be the vigour of the animal; and the conclusion, it need not be remarked, is equally unavoidable, that the reabsorption of that which *imparts vigour by being removed*, ought rather to have an injurious than a contrary effect. While we do not believe in either the reabsorption of semen, or the view which ascribes bodily vigour, &c., to any such action, we are equally inclined to dispute the conclusion, that the vigour of the animal depends on the testes taking from the blood the elements of the seminal secretion, the debilitating effects of excessive sexual indulgence being too well known to every physician, to press the serious consideration of such an absurd view. Why, tabes dorsalis, as resulting from excessive indulgence, has been known from the earliest antiquity, and described by the fathers of medicine. Under the name of ΦΘΙΣΙΣ ΝΟΤΙΑΣ,* literally "Humid Tabes," it is described by Hippocrates, as a disease of the spinal marrow, and incident to newly married people who indulge in marital excesses.

Again, if the power of the voice and the growth of the beard depend on seminal reabsorption, it is not narrated that in cases of occlusion of the vas deferens, or induration of the epididymis any change was apparent in these respects. Indeed, in Sir Astley Cooper's case the patient "was in the habit of shaving once and sometimes twice a week." Twenty-eight years after the operation his voice, naturally feeble,

* Περὶ τῶν ἐνθὸς Παθῶν and Περὶ Νοσῶν.

remained as at the time of the operation. The arguments in favour of the reabsorption of semen must consequently be dismissed as fanciful and untenable. That there is a difference between castrated and non-castrated animals we are not prepared to deny; the cause we are disposed to ascribe first, possibly to the shock; and secondly, to the removal of organs so intimately associated with the medulla oblongata; thus disturbing by their removal a co-ordinating pole of nervous equilibrium, and diminishing muscular vigour by some impression on the medulla oblongata.

Budge relates the following observations regarding the influence of the cerebellum on the testes and vas deferens. "By a lucky coincidence," he remarks, "I made the gratifying observation that in an old cat, whose testicles lay in the abdominal cavity, those organs, immediately after death, moved, whenever the cerebellum was irritated by the scapel or with caustic potash. The effect was such, that whenever the right lobe of the cerebellum, and the right half of the vermiform process were irritated, movement of the left testes ensued, and the reverse. Mere superficial irritation sufficed to produce the result. The movement of the testicles soon became so palpable in the animal that there could be no doubt as to its reality. I hastened to open the entire skull, and the abdominal cavity, and found the testicles lying perfectly still, without any trace of movement. On irritating one side of the cerebellum the testicle of the opposite side swelled, quitted its position, and rose up so as to form a right angle with the spermatic cord, one side of the angle being directed forwards. If I desisted from the irritation the testicle returned to its position, and the

movement was renewed on renewing the irritation. The experiment was repeated during half an hour with unvarying results. . . . In the ductus deferens the movements were alternately those of elevation and depression, an entire portion being distended and collapsing," &c. &c.

Larrey records the following interesting case bearing on the subject. A soldier wounded in the occipital region was attacked with all the symptoms of inflamed cerebellum, which despite treatment, were dissipated only on the appearance of an abscess which opened spontaneously on the nape of the neck. Three months afterwards he rejoined his regiment, and many years elapsed before he again came under Larrey's notice. His appearance was then so altered that Larrey mistook him for a young conscript exhausted by some asthenic disease. He was thirty-two years of age, of middle size, but thin and pale; his eyes were depressed, his lips blanched, his hair, more especially that which covered his occiput, was thin and bristled, and a feeling of pain and coldness was always felt in the back portion of his head. Being beardless, and possessing a feminine voice, a suspicion of his sex arose among his comrades, and an examination disclosed the following condition:—"To our great surprise," says Larrey, "we found his genital organs reduced to the size of those of an infant some months old. His penis was not more than five or six lines long, and two or three lines thick; it never exhibited any degree of erection; and his testicles were so wasted as scarcely to equal in size a small bean."—*Clinique Chirurgicale*, 1830.

So far, then, we have adduced reasons for the following opinions:—that the secretion of semen is constant

in health, its quantity and rapidity of secretion being subject to certain mental states; that while spermatozoa may be found in the epididymis and vas deferens, the vesiculæ seminales act as seminal reservoirs; that independently of the testicular secretion fluid may be extruded from the vesiculæ, prostate, and Cowper's glands conjointly, and probably singly; that the presence of spermatozoa in a fluid from the urethra gives only an affirmative proof that such fluid is seminal, for their absence does not prove that the fluid is *not* seminal, that semen is not discharged in health with the urine, and that seminal fluid is not reabsorbed. We may be supposed to have landed ourselves on the horns of a dilemma, inasmuch as the only means remaining for the disposal of semen is that of seminal emission. To this conclusion the facts we have submitted force us; but we must qualify this belief by asserting our conviction that a power of accommodation is inherent in the organism, so far as all the secretions are concerned; and hence, in the case of the seminal secretion, where a mechanical imperfection seems to some, to exist, a regulating influence of the nervous system meets the supposed want. Thus, semen, it would appear, is secreted but very slowly when the vasa deferentia and vesiculæ seminales *are full*, but no sooner are they emptied than the testicles and associated organs supply the want created, for it seems to be the normal condition of the vasa deferentia and the vesiculæ to be full, thus enabling human beings, in contradistinction to animals, to have sexual congress at any time. But should physical or psychical causes determine secretory stimulation, the *vis a tergo*, in continent individuals, occasions involuntary seminal emission, an occurrence

in healthy individuals under these circumstances, between the period of puberty and the advanced age of even sixty, as my experience has shown, inseparable from our present organisation. Hence I contend that seminal emissions, in continent individuals within given limits, are rather significant of health, and that their absence under these circumstances would be calculated more to surprise, than their presence to excite alarm. The theory of absorption of semen is maintained, I believe, mainly for the following purposes. In the first place, to alarm young men chiefly; and, on the other hand, to square matters with certain angles of the moral law; and consequently, ten chances to one, it is my impression, that he who advocates it must either be a fool or an impostor.

While it seems perfectly in accordance with sound physiology to infer that somatic or psychical irritation determines an increased glandular secretion, it would seem equally *unreasonable* to infer that the secretion of any glandular body is exclusively under the influence of physical or emotion causes; hence, while preternatural secretion may be induced on the one hand, there must, on the other, be such a condition as independent normal secretion, and to the extent that involuntary seminal emissions are due to this *vis a tergo* from normal secretion, the idea of treating them as manifestations of disease, I look upon as unreasonable and suspicious in the extreme.

The practical lesson conveyed by this normal condition is the propriety of forming matrimonial alliances at a period of life indicated by Nature—a behest which, paradoxical as it may appear, is duly observed by primitive races, while obedience to it is rendered im-

practicable in the more advanced conditions of social life by the barriers interposed by the concomitant artifices of society. Hence, one of two things must happen; inconvenience from ungratified natural instinct, or a discarding of extra matrimonial chastity—an obligation which, theoretically, it is very becoming to inculcate, while, practically, all that can be said regarding it is, that it has been to a very great extent disregarded in all time by the most cultivated races as irreconcilable with human passion, and has of necessity disclosed, as the history of all civilised nations displays, a felt want in calling into existence a class who always abrogate to some extent the more sacred ties of matrimony, and which having existed from the earliest times, *pari passu*, with so-called civilisation, will continue to exist so long as “civilisation” takes its present unnatural shapes, despite the milk-and-water philosophy of a very weak section of humanity.

Reverting more particularly to our subject, it is not contended, that while involuntary seminal emission within certain limits, and under the circumstances referred to, must be looked upon as normal, that exaggerated seminal emission may not constitute a pathological condition demanding the attention of the physician or surgeon. To draw the line of demarcation in these cases requires the exercise of sound judgment, uninfluenced necessarily by preconceived prejudice, and a consideration of the general symptoms which a given case may present; for obviously much will depend on the natural vigour of the patient, and therefore a robust person will tolerate with impunity a drain upon the system from which a weaker one might suffer dangerous consequences. As we have seen, that

the secretion of semen may be stimulated by psychical or somatic causes, the question presents itself, *Is there any period of life at which there is a normal nervous excitation?* There is, and that period is the important and interesting one of transition from adolescence to manhood. It is at the period of puberty that both mental and bodily functions attain their complete development.

Physically, the voice is changed; it becomes fuller, deeper, and more sonorous, the sexual organs become fully developed, and incipient beard makes its appearance, while psychically, with the increased cerebral development, corresponding mental emotions manifest themselves. To quote the eloquent language of Feuchtersleben—"The mind of the young man is powerfully impelled in the direction of the will, that of the maiden in the direction of feeling; images of undefined delight float before their minds; the enchantress Fancy reigns in all her loveliness; soothing and rapturous emotions alternate in a constant tumult of ecstasy; and love as a passion, with flattering but despotic hand—fortunate those who are able calmly to guide it—seizes the sceptre. When happily controlled, whether designedly, through education and self-reflection, or undesignedly, by an harmonious proportion of the desires in the natural disposition, love becomes the source of the most beautiful psychical developments; and he who never loved is or will become egotistical, mean, narrow-minded, covetous, timid, and but too often an unnatural sensualist."

The period of puberty is thus a highly critical one; it is one on which the character of the *man* is reared; and treading thus on treacherous ground, the ennobled

youth, distracted on this hand by undefined longings which he seeks in vain to explain, and on the other, by the brilliant phantasmagoria of an excited imagination, conquers more than armies in conquering himself. While loose reins are given, therefore, to fancy, is it but natural that, amid the conflicting mental emotions of this trying period, man's relation to the opposite sex should occupy a prominent part? If, accordingly, there happens at this period, in at least the majority of cases, an exaggerated occupation of the mind by sexual fancies,* can we feel surprised if this state should be manifested in aberrant physiological conditions of a corresponding nature? Hence, we infer that involuntary seminal emission at puberty ought to be considered normal to an extent that would not so obtain in later periods of life. It is, therefore, remarked by Mason Good, that "in the case of young men, when entering upon or emerging from pubescence, and of the relaxed and delicate frame just noticed, nothing is more common than involuntary erection and seminal emission during sleep, often connected with a train of amorous ideas excited by the local stimulus." Dr Good refers the amorous train of the imagination, it will be remarked, to peripheral irritation. We have endeavoured to show in the foregoing, that while local irritation may, on the one hand, be sufficient to account for this mental perversion, in other cases it is purely psychical; but to this part of our subject we shall return more fully in the sequel. "It is hence not diffi-

* Curiosity has certainly not a little to do with this mental condition. In consequence of the mistaken zeal which envelopes this subject in the profoundest mystery, obscene books are searched out, and the most lascivious passages in Ovid, and the classics generally, contribute too much to form the intellectual food of this period of life.

cult," remarks this distinguished author, "to conceive that members so irritable as the sexual organs, when once the imagination leads energetically to the subject of concupiscence, should occasionally participate in the vision." "In some morbid states of the body, and especially when accompanied with local irritation, produced by inflammation, fibrous entony, the debility of old age, or a habit of vicious indulgence, a seminal flux has sometimes taken place without any connection with the dream, and sometimes without either erection or turgescence; but this does not constitute the affection immediately before us, in which the stimulant power lies in the sensory (sensorium?), and is propagated from that organ to those of generation."*

It is clear, from the latter quotation, that in this case Dr Good refers to a disturbance, as we term it, of the psychical balance. The same thing occurs, as we have seen, in cases of infantile enuresis, and the subject did not escape the philosophical penetration of Lucretius, the Roman poet, as the following extract testifies:†—

"Multi mortem obeunt; multi de montibus altis
Ut qui præcipitent ad terram corpore toto,
Externantur et ex somno quasi mentibus capti
Vix ad se redeunt permoti corporis æstu.
Flumen item sitiens aut fontem propter amœnum
Adsidet et totum prope faucibus occupat amnem.

* Illustrative of the effects of a strong mental impression on the functions of the body, the following case may be mentioned:—Mrs T. consulted me, Nov. 1st, 1871, as to indifferent health. Nine months ago she was confined. The day after her confinement, her own medical man injudiciously communicated to her some information which made a strong impression of fear on her mind. The discharge at once ceased, and did not again recur during convalescence, and sometime afterwards numerous boils appeared on her legs and lower part of the body.

† Lucretius de Re Natura, iv. 1020.

Pueri sæpe, lacun propter seu dolia curta,
 Somno devinctei, credent se extollere vestem ;
 Totius humorem saccatum corporis fundunt ;
 Quam Babylonica,* magnifico splendore, rigantur.
 Tum, quibus ætatis freta primitus insinuantur,
 Semen ubi ipsa dies membris natura creavit,
 Conveniunt simulacra foris e corpore quoque,
 Nuntia præclari vultus, pulchrique coloris,
 Qui ciet irritans loca turgida semine multo,
 Ut, quasi transactis sæpe omnibus rebus, profundant.
 Fluminis ingenteis fluctus vestem que cruentent." †

What is normal, then, both psychically and physically, may lapse into that which is abnormal, and while at puberty and the change of life (in females) there is a proneness to mental aberration, physical infirmities

* *Vide* Ovid's *Heroides*, Epistle of CEnone to Paris.

† Many meet death ; many, as if tumbling down from high precipices to the ground with their whole body, are scared with terror, and, after sleep, as if they were out of their judgment, scarce come to themselves again, quite disordered by their body's turmoil. Again, a thirsty man sits down beside a river, or a pleasant spring, and gulphs down well-nigh all the stream. Cleanly people often, when asleep, believing that they are lifting their dress beside a urinal or the public vessels, pour forth the filtered fluid of their whole body, and the Babylonian coverlets of surpassing brilliancy are drenched. Then, too, those into the boiling current of whose age seed is for the first time passing, when the ripe fulness of days has produced it in their limbs, idols encounter from without from what body soever, harbingers of a glorious face and a beautiful bloom, which stir and excite the appropriate portions of the frame, and often occasion fruitless anticipations of the pleasures of love.

With reference to this subject, the following amusing anecdote concerning Archidice, a celebrated Greek courtesan, is related by Ælian. She demanded a great sum of money of a young man who loved her ; the bargain broke off, and the lover withdrew *re infecta* ; he dreamed in the night that he lay with the woman, which cured his passion. Archidice, on learning this, pretended that the young man ought to pay her, and summoned him before the judges ; the judge ordered the man to put the sum of money required in a purse, and to move it, so that its shadow might fall on Archidice ; his meaning was that the young man's pleasure was but the shadow of a real one. The celebrated Lamia, another courtesan of equal celebrity, mistress to Demetrius Poliorcetes, condemned this decision, on the ground that the shadow of the purse had not cured the courtesan's passion for the money, while the dream had cured the young man's passion for the woman.

as associated with sexual irregularities have been recognised by the earliest cultivators of medical science.

Having thus cleared the ground so far, the next part of the task set before us is to indicate the symptoms which constitute involuntary seminal emission a pathological state.

Of symptoms as detailed by some writers there is indeed no scarcity. The connection of many of those so-called symptoms with spermatic incontinence is too frequently the most wildly and unreasonably imaginary; while the importance of many others has been grossly exaggerated purposely, no doubt in many cases, and comprise certain "symptoms" common to humanity either in health or disease.

Like all other diseases this one must differ in degree, and between the spermatorrhœa of terror and tabes dorsalis, a wide gap assuredly exists. Every case must, consequently, be taken on its own merits. The question is often asked as to the value of frequent occurrence, in determining the necessity for interference. As already observed, it is difficult to draw the line of demarcation, but if it be asserted, on the one hand, as has been done by writers on this subject,* that more than one involuntary seminal emission in a month, in continent persons, constitute spermatorrhœa, then I assert most unhesitatingly, that there is not one continent young man in fifty in Great Britain who is not suffering from spermatorrhœa! In the great majority of instances the physician is consulted simply regarding the occurrence of nocturnal emissions; and should they occasion lassitude, fancied or real debility, or mental worry, and occur

* Milton on Spermatorrhœa.

more frequently than once in ten days or a fortnight, medical or surgical treatment may be beneficially enjoined. While these cases may be taken as constituting the large majority, and the one extreme of the scale, it cannot be denied that certain grave consequences are clearly traceable to excessive seminal drain upon the system. Thus Dr Barclay, whom no one can accuse of exaggeration, and who justly reprehends the "obscene familiarities" in which some writers on this subject have indulged, observes, "Painful as the inquiry must be to every right feeling man, we must not neglect the suggestions of the wan aspect, and the shrinking eye of the young man, who has brought upon himself, as the fruit of his vices, the penalty of a constant spermatorrhœa."

Scarpa remarks that, in general, those cases of amaurosis may be regarded as incurable which have existed for several years in persons advanced in life, and those which have been preceded by great and protracted incitement of the whole nervous system, and afterwards by general debility and languor of the whole constitution, as after the long abuse of spirituous liquors, manustupration, or premature venery.

Tanner describes the consequences of spermatorrhœa as "general weakness, with nervous irritability. There is a mental depression, as well as a desire for a dreamy kind of existence, rather than a wish to follow any active kind of occupation. The digestive organs frequently get disordered, as is indicated by flatulence and constipation; the sense of hearing and, not uncommonly, of sight, becomes dulled; there is loss of memory, and an inability to fix the attention; while attacks of palpitation, giddiness, shortness of breath, headache, and

neuralgia are far from uncommon. In extreme instances, I believe, the final results may be epilepsy, phthisis, insanity, or impotence."

Mr Erichsen describes true spermatorrhœa in the following terms :—" In this form of the disease there is a mixture of irritability and of debility. The generative organs are excited by slight emotional causes, or by trivial and ordinary physical stimuli—a thought, a look, a word, the movement of a carriage, the effort of straining at stool, will excite the secretion of the testes, which the debilitated state of the parts allows to escape with a feeble ejaculatory effort. In the slighter cases, and in the earlier stages of the disease, these emissions take place but occasionally—three or four times a week, chiefly in the morning, in the mid state between waking and sleeping, and are preceded by an erection. In the more advanced stages, the emissions occur once or oftener in the twenty-four hours without an erection; the semen, at last, when discharged, flowing back into the neck of the bladder, escaping with each discharge of urine, or being squeezed out after defecation. The patient's physical and mental state becomes seriously implicated in those cases of true spermatorrhœa. His countenance is pallid, anæmic, and sallow, his features are drawn, his eyes lifeless, his spirits depressed, often to the lowest depths of despondency and despair; connection is impracticable, as the discharge of semen takes place before erection occurs."

It would be absurd to attach no importance to testimony from such sources as these—to contend that such conditions are not diseased ones—and it is surely at variance with the beneficent spirit of our calling to turn a contemptuous look on any such sufferers, and

consign them without compunction to the tender mercies of the charlatan.

Hippocrates believed *tabes dorsalis* to be an affection of the spinal cord, attended with a sense of formication, or a feeling like that of ants creeping along the back, and refers to a seminal discharge during micturition, which renders the sufferer impotent. And he confirms Scarpa's observation by reference to a failure of sight. Memory is likewise impaired, as generally the power of physical endurance.

The disease described by Hippocrates has been "discovered" a few years ago by Duchenne, of Boulogne, and described by him under the name of *ataxie* * *locomotrice progressive*, and now familiarly known in the present medical literature as progressive locomotor

* From α privative, and $\tau\alpha\chi\iota\varsigma$, order.

Dr Bradbury, of Cambridge, records (Brit. Med. Journal, Oct. 28th, 1871) a case of locomotor ataxy, due, evidently, to excessive onanism, of which the following is an outline:—A young man of eighteen was admitted into Addenbroke's hospital, suffering from the following condition:—Three years prior to May 1871, he first complained of pain and weakness in the small of the back, which became aggravated by cold. Nine months ago he began to loose control over his legs; when he walked he staggered as if intoxicated—his legs were thrown out at random, and he brought his heels heavily to the ground. He could not walk when his eyes were closed without falling on the floor, and he fell to the ground when he stood upright, blindfolded, with his feet together. The conjunctivæ were injected, but the eyes were otherwise natural. He was deaf in the left ear. He complained of frontal and occipital headache, with vertigo. Sensation was not impaired, and the muscles of his legs were not wasted. When first admitted there was some slight loss of power in the left arm, which eventually passed away. Pains of short duration shot down the legs. There was no loss of control over the sphincters, except occasional dribbling of urine. He confessed to having practised masturbation to a great extent since the age of nine years, and at this time he was troubled with spermatorrhœa. A brother who came to see him had a peculiar gait, and Dr Bradbury was of opinion that, while the exciting cause was excessive onanism, there was an hereditary predisposition to this neurosis in the family. This is only the fourth case of locomotor ataxy published as occurring under the age of twenty.

ataxy. The disease is not to be confounded with simple paralysis from spinal disease, as it is characterised more by a want of co-ordinating power; and excessive sexual indulgence must be looked upon simply as an occasional factor in the elements of causation.

While not denying their existence, I have just to remark, that in several years' practice I have seen nothing to approach in severity the graver symptoms alluded to as due to involuntary seminal emission.

We now pass to inquire, *whether there are any pathological conditions significant of inordinate seminal emission, and, if so, how caused?*

The subject under consideration has been variously and fancifully classified. The learned author, whose work we have already laid under contribution in these pages, Mason Good, under the term *Salacitas*, describes four varieties of seminal incontinence—

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|-----------------|-------|------------------------|
| (a) Pubertatis, | . | Salacity of youth. |
| (b) Senilis, | . . . | „ of age. |
| (c) Entonica, | . . . | „ of full habit. |
| (d) Assueta, | . . . | „ of a debauched life. |

This classification, on examination, will be found simply to imply that nocturnal seminal incontinence may be due either to sthenic or asthenic conditions of the generative organs. The salacity of youth is usually sthenic, and when unattended with preternatural irritability of any portion of the generative system, as a rule, ought not to be regarded as a disease; for we have seen that, in the mental commotion of puberty the occupation of the mind with sexual ideas is so frequent that it must be regarded as human. We, therefore, would draw no distinction, *as a rule*, between this variety

and that described by Mason Good as entonica salacitas. That of a debauched life, on the other hand, or that of age, we need not say, we regard as the asthenic variety.

But while, as a rule, salacity of youth is due to sthenic conditions, it must be borne in mind that it is a law of nervous excitability that, if stimuli are too violent relatively to the part acted upon, or too long continued, excitability is exhausted, and over-tension is succeeded by relaxation. Hence asthenic salacity may occur in youth.

It will follow, accordingly, that preternatural excitation of a gland may result in chronic irritation, in accordance with the laws, *ubi stimulus ibi humerorum uberior adfluxus*, and the equally true, though converse one, *ubi adfluxus ibi irritatio*.* Hence genital irritation

* The intimate connection existing between spinal complaints and the function of the testicles is illustrated in the subjoined case, which occurred in the practice of the late Mr Solly. The subject of it (*vide* Mr Solly's Surgical Experiences) was a fine young man, about 23 years of age. About two years and a half previous to his consulting Mr Solly, he fell from a height of sixteen or seventeen feet with his back flat on a hard gravel walk. He was stunned at the time, though he did not strike his head directly. He received immediately the best advice; was bled from the arm, and leeches over the hip. He was very sore, and had severe headaches for some days afterwards, and was not able to walk until seven or eight weeks had elapsed from the time of the injury. He was then examined by several medical men, and pronounced sound. After this he went abroad, and lived rather freely. Just ten months before consulting Mr Solly he began to suffer from involuntary seminal emissions, accompanied with great feeling of weakness in the back. About two months after these first appeared he remembers finding a swelling on the left side of the loins, but this inconvenienced him so little that he did not even mention it to his medical attendant, who treated him for dyspepsia, ordering him plenty of horse and pedestrian exercise, with tonics; but he continued to get worse, and was obliged to return to England. On his arrival he applied to an eminent surgeon, who treated him for spermatorrhœa with the caustic catheter. He remained under his treatment for two months, but without improvement, when Mr Solly was consulted. As the result of this gentleman's examination, he concluded that the spermatorrhœa had a spinal, and not a

has been referred to the testicles, the urethra, the vesiculæ seminales, and the prostate, as occasioning spermatic incontinence. Speaking from my own experience, I have never been able to associate nocturnal seminal incontinence and testicular irritation as cause and effect.* That, in certain cases,—such as those described under the vague term, irritable testis, a rare affection by the way,—spermatic incontinence might be thus induced, I can readily believe; the idea being in accordance with what has been already advanced.

generative origin. On stripping patient, an elastic, elongated swelling, about four inches in length, was found on the left side of the lumbar vertebræ. On rapping the spine in this region, patient felt a thrilling pain shooting down his legs, with some numbness. Walking, riding, &c., caused the same pain. Weakness complained of in both legs, more especially right. He dragged this leg in walking, and could not balance himself naturally. Countenance anxious, and he looked out of health. The nocturnal emissions occurred frequently, without erection or pleasurable sensations. Spermatozoa in urine.

Putting the facts of the case together, Mr Solly inferred that the spine had been injured about two and a half years previously. At first he feared there was an abscess, but hoped the case was not so serious, as pressure and rapping on the spine were so well borne. He had no doubt, however, as to there being chronic inflammation of the ligaments of the vertebræ and theca vertebralis. With a view to this state he ordered complete rest, a large moxa to be made over the swelling, and quinine with sulphate of magnesia. Subsequently, this medicine was changed to carb. ferri with pil. aloes c. myrrh. Six weeks afterwards the result is thus detailed—

“V. T. is going on as favourably as when you saw him. The issue discharges well. He has not any numbness on tapping the spine, nor any disagreeable sensation. He has had several emissions, but they have been attended with natural feelings, and have not left him in the weak, nervous state as when they occurred some months ago,” &c.

The above bears date 22d October, 1852. On 4th December, “The swelling has been entirely absorbed, and on both sides the loins are exactly the same size and shape. The nocturnal emissions have ceased; the urine is free from spermatozoa.”

* Since the above was written I have attended a young man of twenty-one years of age, for acute epididymitis. On enquiring whether he could in any way account for the affection, he confessed to having practised masturbation for the past six years.

The same thing may be said of irritation of the urethra, which, however, except as the result of specific inflammation, is rarely met with; as for irritation of the vesiculæ, I should like to be informed how it is to be diagnosed, and diagnosed, how treated?

That irritation, individually or collectively, of these organs *may* exist, I am not prepared to deny, but it is my firm conviction, that in the vast majority of cases the source of irritation occasioning spermatic incontinence is to be discovered in the prostatic portion of the urethra. Practically, the localisation of irritation in any other portion of the genito-urinary system may be discarded.

In treatment, however, we can afford to overlook nothing calculated to disturb the normal nervous balance, irritation from ascarides, fissures in the rectum, gravel, and from sebaceous matter under long prepuces, or in cases of congenital phimosis, must be inquired into, and if existing removed.

Prostatic irritation may be caused by the extension of gonorrhœal inflammation to the orifices of the ejaculatory ducts, as likewise by the presence of stricture, which, by opposing an obstacle to the passage of urine, establishes a morbid condition of the mucous membrane between the seat of stricture and the neck of the bladder.

If it be inquired how this irritation is usually caused, we will be anticipated in our explanation, that it is due to inordinate sexual congress, or to masturbation—a practice more common in schools, particularly boarding schools, than people care to admit, and for the prevention of which, and the preservation of health in numerous other respects, the teaching, at least of the elements of human physiology as a branch of a liberal

education, is imperatively demanded. The mysteries of life, and the laws which regulate health, are surely of not less moment in the mental cultivation of youth, than a knowledge of the obsolete, and too often debasing customs of Greece and Rome. Our own times have exhibited appalling instances of social degeneracy, the fruit of a refined sensuality, or Circean voluptuousness and moral abandonment, boasting the parentage of civilisation; and hence the question of physiological tuition of youth is one not less for the statesman than the medical man.

Sævior armis

Luxuria incubuit victumque ulciscitur orbem.

Prostatic hyperæsthesia in some cases induces coarctation of the urethra independently of gonorrhœa, as exemplified in the following case which recently came under my notice:—A young gentleman, for a year prior to consulting me, confessed to practising masturbation. His passions, he alleged, had been first excited by reading Boccacio's Decameron. He had been engaged to be married within a month of the time I had seen him first, and fearing sexual incapacity, he consulted me. On passing an ordinary sized bougie great tenderness and narrowing of the canal were discovered in the prostatic region. Bougies were passed within given periods, alkalies, and sedatives prescribed, and in a fortnight afterwards a number *ten* could be passed without the slightest difficulty or the production of pain. Patient never had gonorrhœa; he married at the appointed time. His health and spirits have continued excellent.

Hitherto reference has been exclusively made to nocturnal seminal incontinence; but in certain rare

cases, I am inclined to think, seminal incontinence may be diurnal. In these cases there is such extreme prostatic irritability or relaxation that the least excitement, physical or mental, occasions an involuntary emission. Though these cases are described as frequent, I am personally cognisant of but one, and it may be a consolation to any suffering from a similar infirmity, that the subject of it in this case is at present alive, married I believe, and in excellent health.

Mr Benjamin Philips, in his papers on this subject, relates the case of a young man whose sexual organs were so debilitated, that on every occasion of receiving a letter from a former mistress emission of semen took place, and the mental emotion occasioned by writing to her in return had a similar effect.

Again, semen may pass away unconsciously in the urine, and thus affect the health. I do not know whether Dr King Chambers still holds the opinion expressed in 1861, that this may go on for years without any physical or mental impairment unless the patient's mind is directed to the subject. If he does so, I think he will find himself in a very small minority of the profession. Mr Teevan of London, on the other hand, considers this "true spermatorrhœa," and alleges that is not usually due to debauchery, but to indigestion,(!) "for in that complaint the semen becomes attenuated, and the bowels constipated; hence spermatozoa are pressed out by the powerful contraction of the levator ani. . . . Microscopical examination alone could determine the existence of true spermatorrhœa, and for that purpose the lowest stratum of urine passed during or after defecation ought to be examined." I am not sure that some of Mr Teevan's

positions are not unwarrantably assumed. The attenuation of semen by indigestion might admit of an argument; and the inference deduced therefrom, it humbly appears to me, to be suspiciously like the common failing of reasoning in a circle. It will be remarked that Mr Teevan's opinions are in direct antagonism to those of others who contend that the material discharged during defecation is not seminal, and equally at variance with those of Dr Chambers, from whom we likewise differ.

By far the most important of the alleged effects of seminal incontinence is that upon the mind, and now may be the proper time to investigate this part of our subject. The susceptibility of being imposed upon is one of the most painful weaknesses of a fallen humanity. The imposition is not exclusively *ab extra*; it is too frequently *ab intra*. It is thus that the obstetrician unravels the most puzzling chain of morbid symptoms through the instrumentality of an abraded os, or a uterine version or flexion of some description real or imaginary—more probably the latter. It is thus that “irritation of the liver” is made the pathological sanctuary of another numerous class of profound “observers,” and are we not all familiar with the uncomfortable—nay, the dangerous developments of the cardiac physician?

Positions are assumed, and based upon some symptom whose presence is undeniable, dogmatically laid down—for the power of assertion is omnipotent,—and fact and observation are made to bend in reconciliation to them. To me this seems to be the explanation of the frequency with which insanity is ascribed to genito-urinary affections. It is not denied that, physiologically, an intimate connection exists between the brain and

the focus of generation, but it is contended that independently of this, there are other circumstances which predispose to insanity in these melancholy cases, and that in a great number of the recorded cases in which sexual aberrations and insanity are looked upon as cause and effect, the conclusions are not based on a sufficiently wide induction. The very fact of its being suggested to the mind, as is so frequently done, that seminal emissions are so prone to cause insanity, is something horrible.*

Let us but fancy the case of an unsuspecting youth who has unfortunately inherited the insane neurosis. He may in tender years have been addicted to a very common vice, and have abandoned it with intense loathing. He finds in the literature of our profession that more than one seminal emission in a month is a disease—nay, a dreadful malady, bringing in its train insanity, suicide, and the thousand-and-one horrors which quacks, professional and non-professional, conjure up in ghastly array; and, I ask, is the preparation for an asylum not effective as it is fiendish? I have known some of such cases, and with the knowledge of them before me, I protest, in the name of an outraged

* It is not a little humiliating to find a man of Dr Hassall's pretensions quoting rubbish from one or two authors who have written very extravagantly on this subject, and giving expression to such statements as, that, "under the term spermatorrhœa are to be included all losses of the seminal fluid not occurring as the result of intercourse." "When several emissions occur in quick succession on the recovery from an illness, they are termed *critical*!" "The *consequences* of spermatorrhœa are even more numerous than the causes, and among them may be enumerated debility, disinclination to exertion of body or mind, timidity, want of memory, confusion of ideas, and despondency." These, there cannot be a doubt, are occasionally due to this cause; but the height of extravagance is reached in the assertion, that "phthisis, cerebral congestion, epilepsy, general paralysis, and insanity," are to be regarded as consequences save in the light we have endeavoured to explain.

profession, that much of the literature of this subject is unchristian as it is unscientific, and cannot be branded in terms too indignant.

The very unbosoming, to a confiding friend, of a hideous mental incubus might be a very salvation; but distracted by the reproaches of mature reason and knowledge on the one hand, and a dark abyss on the other, can it be wondered that dangerous error thus pampered before the victim of "nervousness" forsooth! may gradually erode the intellect or overthrow reason itself.

The human mind is at best an enigma—a dark, unfathomable arcanum whose mysteries are inexplicable; nor age, nor position, nor learning, nor character, is exempt from its treacherous perversions; and it is well known to the medical psychologist that now and then, particularly in cases where the insane neurosis is inherited, that it requires but the suggestion of some horrible train of thought to establish a perfect monomania. Horror fascinates by its horror; and I for one firmly believe, that as a man is educated, refined, and honourable in his feelings, to that degree he is more liable to mental alienations.

There is, therefore, an awful culpability in holding up insanity and its dire concomitants before any one suffering possibly from a mild functional disease, as the punishment of a *very* common transgression; and it is transcendently infamous when this is done by organised bands of empirics gloating over the gullibility, the simplicity, and the blighted happiness of youth.

But we forget—we are British subjects; and the Government which scrupulously protects us from betting frauds, looks with indifference on a foul ulcer

eating into the very vitals of those to whom we consign the perpetuation of our greatness !

It would be instructive, and I doubt not it would be appalling, to ascertain to what extent insanity in Great Britain is due to the wide-spread diffusion of quack medical literature ; and if ever a subject called loudly for a Royal Commission of Inquiry, this assuredly is one.

It is perfectly indisputable that certain mental affections have a close relationship with sexual aberrations, and that these are particularly apt to occur at puberty.

Erotomania in the male, and satyriasis in the female, may be regarded simply as more exalted mental conditions of a normal state. It is to *this* cause, and not to sexual excesses, that the extravagant rhapsodies of J. J. Rousseau are to be ascribed. In a word, Rousseau was mad. That he was so is shown by his being the subject of other delusions, such as being persecuted by all the world ; and the idea of associating his ravings on sexual subjects with an infirmity to which he confessed, is wholly untenable.

While it is contended that, as *a rule*, these mental aberrations are purely psychical, we confess that peripheral irritation or disease of the central organs may contribute to their development, or independently occasion them. Cases of erotomania are recorded, in which tumours or other affections of the cerebellum have been discovered *post-mortem*. In females, on the other hand, certain forms of recurrent mania are apt to occur during the menstrual period ; and in parturient females, the occurrence of puerperal mania is no doubt due to the important physical disturbances incident to those critical periods of female life.

Cases of priapism are common enough from injuries to the spinal cord. These, it is worthy of remark, occur only when the injury is sustained near the sixth dorsal vertebra, at which point the sacral plexus combines with the cord.* That part of the cord between this situation and the brain may be looked upon as the inhibitory portion of the nervous system in respect of the genito-urinary organs; and, *en passant*, it may be remarked that this might seem the proper situation for blistering (the region of the sixth dorsal) in cases of genito-urinary debility.

On the subject of insanity, turning from these parenthetical remarks, we find Dr Maudsley remarking, "The development of puberty may lead indirectly to insanity, by becoming the occasion of the vicious habit of self-abuse in men; and it is not always easy to say, in such cases, how much of the evil is due to pubescence, and how much to self-abuse. But the form of mental derangement *directly traceable to self-abuse* (the italics are mine) has certainly characteristic features. There are no acute symptoms, the onset of the disease being most gradual. The patient becomes offensively egotistical and impracticable; he is full of self-feeling and self-conceit; insensible to the claims of others upon him, and of his duties to them; interested only in hypochondriacally watching his morbid sensations, and attending to his morbid feelings. His mental energy is sapped; and though he has extravagant pretensions, and often speaks of the great projects engendered by his conceit, he never works systematically for any aim, but exhibits an incredible vacillation of conduct, and spends his days in indolent and suspicious self-brood-

* *Vide* page 87.

ing," and so on. Dr Maudsley is deservedly esteemed an authority on mental diseases, and I have no doubt he has satisfied himself that this is a special form of insanity; though presumptuous, as it must appear, it occurs to me that many of the above symptoms admit of very general application. I much prefer his statement, that "this is a form of insanity which certainly has its special exciting cause, and its characteristic features; nevertheless, I think that self-abuse *seldom, if ever, produces it without the co-operation of the insane neurosis.*" It seems to me that it is difficult to reconcile that there is a form of insanity "directly traceable to self-abuse," with the allegation that it is seldom, if ever, produced "without the co-operation of the insane neurosis." Is the insane neurosis of itself not sufficient to account for the insanity?

Esquirol, in his work "Des Maladies Mentales," remarks,—"*La masturbation, ce fléau de l'espèce humaine, est plus souvent, qu'on ne pense, surtout chez les riches. . . . La masturbation, dont nous avons parlé sous un autre rapport, est signalée, dans tous les pays, comme une des causes fréquentes de folie; quelque fois est le prélude de la manie de la démence, et même de la démence senile; elle jette dans la mélancholie, conduit au suicide. Elle est plus funeste aux hommes qu'aux femmes.*" Some years ago, Dr Ritchie of Edinburgh, then resident physician in Bethnal House Asylum, contributed a series of able articles to the "Lancet" on this subject.

Dr Ritchie there states that in 119 cases which were recognised, after admission into Bethnal House Asylum, to be due to this melancholy cause, in only six was, what he calls the true cause, understood previous

to admission. To those more particularly interested in this part of our subject I would recommend a perusal of Dr Ritchie's able papers. I have read them with the care which they merit; I am willing to admit the undoubted honesty which they display; but I am of opinion that Dr Ritchie has failed to prove his case. I attach far less importance to anything emanating from Esquirol, for sexual vice of every description is in France so prevalent that it might be made to prove anything. Instead of showing a cause of insanity in young men, Dr Ritchie has demonstrated rather the frequency of the vice in question. I believe the fact to be, that it prevails in public schools, and boarding schools, to the extent of the relative frequency of insanity.

Mr Solly, referring to this subject, is very decided. Speaking of Dr Ritchie's papers, he remarks,—“He (Dr Ritchie) has called attention to a subject in which the profession feel the deepest interest. I for one am grateful to him for having had the courage to attack a vice, the existence of which is ignored by many schoolmasters and some medical men; nevertheless, it is practised to a fearful extent. I am surprised that he has doubts whether it is also the cause of epilepsy; I have none.”

Taking leave of this part of our subject, I have to reiterate my belief, that no special form of insanity due to sexual excesses or masturbation has been proved to exist, independently of diabolical suggestions of the quack fraternity.* By all means let us co-operate with

* Apropos of this subject, Dr Mapother of Dublin, in an address “On American Medicine,” delivered at St Vincent's Hospital, Dublin, in opening the Session 1870-71, remarks,—“I have elsewhere contended that the spread

psychologists in arresting, by calling attention to a debasing and pernicious vice; but it behoves us to be watchful that the means employed for that end do not defeat the objects intended. Psychologists cannot, therefore, be too careful in avoiding overdrawn and sensational pictures, which are no sooner called into existence, bearing the stamp of authority, than they are made the instruments of torture to fill the coffers of the charlatan, as well as the asylum. It is these fiendish suggestions, I am persuaded, that cause insanity, more especially *among the poorer section of intelligent youth*, fretting under a sense of their inability to atone the vampires, possessing, as they believe, the power of life and death, sanity or insanity.

Phthisis has also been instanced as due to this cause likewise. In 1862 Dr Smith, of London, read a paper before the Medico-Chirurgical Society, entitled, "A Statistical Inquiry into the Prevalence of numerous Conditions affecting the Constitution in One Thousand

of the knowledge of the functions of the human body was the efficient remedy against quackery. . . . Quacks are largely supported by those wretched persons whose diseases have been deemed incurable. The quacks who are most detestable are those who profess to prevent and cure sexual diseases. Their indecent advertisements have caused the minds of the young to dwell on lascivious subjects, encouraged masturbation, and made hypochondriasis common. They have had much to do with the origin and spread of such scarcely conceivable mixtures of lust and lunacy, as Mormonism and Free Love;" and though not bearing intimately on the subject under consideration, I quote the following from Dr Mapother as strongly corroborative of the views I have advanced in my address "On the Relations of Prescriber to Dispenser," and commented on in an editorial article in the "British Medical Journal" for April 22d, 1871:—"The prevalence of quackery, and the generally low state of the profession (in America), depend greatly on the general combination of drug selling with the curative art; and their total separation, while greatly elevating medicine, would stimulate the scientific study of pharmacy—a remark equally applicable to these countries." *Vide* the author's address in the "Pharmaceutical Journal" for 1871.

Phthisical Persons when in Health." Dr Smith asserts that 11·6 per cent of the males had committed sexual excesses; 18·2 per cent. had been addicted to masturbation, and 22 per cent. had suffered from involuntary emissions. To this the objections urged already as to insanity apply with equal cogency. All conditions which weaken the system predispose to phthisis, particularly in cases of the tubercular diathesis, and if sexual excesses debilitate, as it must be confessed they do, they may to that extent induce phthisis; there can be no closer connection as cause and effect. Taking Dr Smith's statistics just quoted, I believe they would apply with equal force to the entire human race as to the one thousand cases on which his inquiry is based. But is it not a *reductio ad absurdum* when *clergyman's throat** is ascribed to spermatorrhœa? The idea is too absurd to merit serious discussion. Doubtless, men reflecting on the thoughtless follies of youth, and finding authority for recognising sore throat as a symptom of spermatorrhœa, *will* believe it, as people will believe in almost any absurdity, and what is physically wanting an excited imagination is too ready to supply.

Paradoxical as it must appear to any one who has given a little attention to functional diseases of the genito-urinary organs, continence, the very opposite of that which is so frequently the cause of functional disturbances, has been assigned a prominent place among the causes of spermatic incontinence. Lallemand maintained this with characteristic obstinacy, and, recently, it has been gravely asserted that, if a young man remained continent to the age of 25 or 26, impotence would be certain to occur. It will be saying sufficient

* *Vide* Mr Acton's book.

regarding such doctrines as this, that they are pernicious teachings to the extent that they are without the shadow of foundation in fact.

It is but proper, however, that I should remark that, to some extent, this view is supported by the high authority of Mr Erichsen, who believes that spermatorrhœa may be induced by continual efforts to repress the "natural sexual desires by a life of enforced or unavoidable continence."

Among the other alleged effects of spermatic incontinence, varicocele is likewise accorded a very great prominence. There is a design in this. By the exercise of that wise foresight which characterises so eminently all the works of that great Artificer, "the Eternal Geometrician," it is so arranged that in the state of health, under ordinary circumstances, the one testicle, the left, suspends lower than its fellow of the opposite side. Excited by the perusal of those vile productions which the press of our country manifests such an anxiety to disseminate, the subject of the horror-inspiring experiment of quackery no sooner stumbles on this "symptom" of what he has been carefully prepared to look upon as a dreadful malady, than he institutes an examination, and then the chances are, sure enough, he finds the "symptom," and one step in advance is made in the slimy embrace of the human reptile. Varicocele has no existence in the majority of cases of supposed varicocele which come under the notice of the medical practitioner. But here, again, it is not to be disputed that, in certain rare cases, varicocele may be due to impaired nerve energy in the sacro-iliac region. In the whole of this knotty cord which our subject presents for examination, there is a

strand, so to speak, of truth, which must be delicately separated from the extravagant assertions of quacks academical and non-academical.

In these cases in which varicocele actually exists as due to sexual excesses, it is to be ascribed to exhaustion of the nervous centres, for, as we have already seen, stimuli which are relatively too violent, may, by too frequent repetition, exhaust muscular tension. Hence the dilatation of the spermatic veins from debility of their muscular coat.

On the 12th May 1871, I was consulted by a gentleman from the north of Scotland, on the eve of marriage, regarding a certain condition of the left testicle. Patient appeared about 35 years of age, and otherwise healthy. On examination, the left testicle was varicosed to such an extent that it felt literally like a bag of worms. He acknowledged having practised masturbation four years previously; to what extent I did not inquire. With respect to procreative capacity, I expressed the opinion, that, the right testicle being perfectly healthy, his condition offered no serious impediment to marriage. I advised the use of a suspensory bandage, prescribed a simple tonic, and gave an adverse opinion as to any interference with the diseased organ. I have heard nothing of my patient since.

It has been suggested that the anæmic condition of persons guilty of sexual excesses may be accounted for in this manner, viz., that local irritation, by producing sub-acute orchitis and varicose veins, cause an interruption to the progressive perfection of blood cells. The opinion that the depressing effects of inordinate sexual indulgence bears a relative proportion to the quantity of semen emitted has been now all but aban-

doned, and in its stead the more natural explanation offered, that they are due to the excessive succession of nervous shocks, and expenditure of nerve force, as likewise the moral influences of degrading practices. "But," as suggested recently by the reviewer of M. Mauriac's work, in the "Practitioner," "if sub-acute inflammation of the testes or epididymis be a necessary step in the train of evils, it at once accounts for that immunity from the effects of the vice, which it cannot be doubted that many persons possess; and on the other hand (as the inflammatory affection is apt to pass unnoticed), it suggests that a sufficient search may frequently not be made into the causes of anæmic neuralgia, especially when the pain is manifested in quite a distant part of the body." Irritable testes, therefore, in addition to varicocele, may in certain cases be one of the results of disturbed sexual conæsthesis. It is characterised by paroxysmal or shooting pains along the cremaster muscle and spermatic cord. In addition to which there is also actual orchitic hyperalgia, as shown by the great tenderness on pressure, the slightest touch of the clothes causing intense pain. Vomiting and a certain amount of fever may be thus induced; the pain is best relieved by support, and the administration of narcotics.

This condition must be distinguished from neuralgic pains extending from the perineum down the thigh, and which will frequently be found to be due to unsuspected stricture.

The etiology of certain diseases relatively to disturbed nervous co-ordination, is by no means a barren one. Of the diseases thus induced, they admit of a twofold classification: on the one hand, those in the production

of which psychical disturbance may be recognised as a factor; and on the other, those whose causes are exclusively somatic. To the former class belong enuresis, spermatic incontinence, and hysteria, to the latter epilepsy, reflex paralysis, tetanus, and some others.

Quite recently, Dr Sayre of New York, has published a record of three cases of partial paralysis from reflex irritation, caused by congenital phimosis and adherent prepuce. Dr Sayre describes his first patient as "a beautiful little boy of five years of age, but exceedingly white and delicate in his appearance, unable to walk without assistance or stand erect, his knees being fixed about an angle of 45° ." Dr Sayre, who was sent for to perform tenotomy on the hamstring tendons of his little patient, soon satisfied himself "that the deformity was due to paralysis and not contraction, and it was therefore necessary to restore vitality to the partially paralysed extensor muscles, rather than to cut the apparently contracted flexors." Proceeding to this by means of galvanism, this gentleman accidentally discovered a peculiar condition of the penis, which is thus described:—"The body of the penis was well developed, but the glans was very small and pointed, tightly imprisoned in the contracted foreskin, and in its efforts to escape, the meatus urinarius had become so puffed out and red as in a case of severe granular urethritis; upon touching the orifice of the urethra, he was extremely convulsed, and had a regular orgasm. This was repeated for a number of times, and always with the same result. The nurse stated that this was his condition most of the time, and that he frequently awoke in the night crying, because his "pee pee" hurt him, and the same thing had often occurred when rid-

ing in the stage or car ; the friction of his clothes exciting his penis would cause erections."

Dr Sayre, naturally associating this abnormal condition with the paralysis, performed circumcision, which operation he fully describes. He adds, "No untoward symptoms occurred, and in less than two weeks the wound had entirely healed, and the penis was immensely increased in size. The prepuce was sufficiently long to cover the glans, and could be readily glided over it without any irritation whatever." "From the day of the operation the child began to improve in his general health, slept quietly at night, improved in his appetite, and, although confined to the house all the time, yet at the end of three weeks he had recovered quite a rosy colour in his cheeks, and was able to extend his limbs perfectly straight while lying upon his back. From this time on he improved most rapidly, and in less than a fortnight he was able to walk alone with his limbs quite straight." A short time afterwards this little patient is described as quite recovered, without the use of any other remedy whatever. If there were but one case of this description, it might be alleged that the recovery and the performance of the operation were simply coincident ; but Dr Sayre relates two other cases of a similar nature. His second case is as follows:— "Mr T. N., one of the first lawyers in our city, called on me at the very time the little fellow above described was making his farewell visit, to speak to me in reference to his son, a lad of fourteen years, that I had attended some months before for paralysis of his legs. He stated that he was not improving, and that he looked so badly in the morning, that he feared he was guilty of masturbation, and was very anxious that

I should talk to him seriously upon the subject, and point out to him its dangers. As the little fellow then running round the office had just recovered from a paralysis that was evidently due to genital irritation, it occurred to me that the paralysis in the son of Mr N., for which I formerly had been consulted, might possibly be due to the same cause. He was sent to me on the following day, and after questioning him very closely, I found him unusually intelligent on the subject, strictly truthful and honest in his statements, and perfectly free from the vice of masturbation. Upon examining his penis I found it unusually large at the root and body, but very short; and the prepuce terminating in an opening scarcely large enough to admit a small probe. He stated that it always took him a long time to make his water, and he could never do so without great straining. His penis would become erected several times in the night, and always with great pain, and this difficulty was increasing as he grew older." The patient was chloroformed, and, as in the former case, circumcision was performed on the 23rd March 1870, and on the 27th April he walked a distance of more than a mile without fatigue, and with no evident signs of paralysis. A year previously, Dr Sayre attended this boy for paralysis of his lower extremities for about four months. In his own words, he "applied galvanism and electricity twice and three times a week, injected strychnine into the paralysed muscles every tenth day, put him on iron and other tonics, and applied India rubber muscles as assistants to the paralysed ones during all that time, in order that he might take exercise, and all without any benefit, because I had not ascertained the cause of his paralysis.

And now, at the end of six weeks, the cause having been removed, he is entirely recovered without any special treatment whatever." And Dr Sayre adds in a footnote,—"*June 15th, 1870.*—This boy has gained nine pounds in weight since the 23rd of March, is robust and ruddy cheeked, and has no symptom of paralysis whatever."

Of Case III. the following is an outline:—"F. G., West Eleventh Street, aged fifteen, a tall, slender, pale-faced, ghostly-looking boy, was sent to me for 'nervousness' and fainting fits. He had been under homœopathic treatment for some months for neuralgia and weakness of the legs, which caused him to trip easily and fall; in fact, he described himself as having 'falling fits, because his legs would not hold him up.' He had all the appearance of a masturbator, but denied having been one, but stated that he was troubled every night with painful erections and frequent emissions. Said it took him a long time to make water, and sometimes it would stop entirely, and the end of his penis 'would swell up like an orange,' and when he squeezed it, 'a little white chunk would come out of the hole, and then the bag of water on the end of his penis would all run out.' This swelling up on the end with what he called 'a bag of water,' had happened quite frequently. He had a very redundant prepuce, which could be pulled at least an inch from the extremity of the glans penis, was not adherent to it, and terminated in a rigid, inelastic ring-like orifice, scarcely large enough to admit of an ordinary knitting needle. The slightest irritation of the extremity of his penis produced the most painful erections, and this he stated was his condition most of the time." As formerly, Dr Sayre circumcised with

the following result:—"It is now six weeks since the operation, and he has not had a single fit in that time, although he used to have one or two almost every day. He sleeps quietly all night, has had only two nocturnal emissions, has increased in flesh and strength, has become buoyant in spirits, and in fact is, as his father says, 'a perfectly changed boy.'"

Further, Dr Sayre relates three remarkable cases of hip-joint disease evidently due to reflex preputial irritation. "On the 7th April 1870, three cases of hip-joint disease came to my office within a few minutes of each other, one from Dover, N. J., one was sent me by Dr Walser of Staten Island, and one by Dr M'Sweeney of Grand Street, N. Y. The two latter were little boys about seven and nine years of age, rather delicate in appearance, and each of them in the second stage of hip disease. After questioning in the most careful manner, I could find no *local* cause for the complaint. They had received no injury, fall, blow, or wrench of the joint that I could get any information about, and I was somewhat annoyed, as in the immense majority of these cases I have always been able to trace the disease to some local origin, rather than to a constitutional dyscrasia. While my assistant, Dr Yule, was making drawings of them, and taking notes of their cases, I examined the third case, the little boy from Dover, who was thirteen years old, and to my surprise I found, like the other two cases, that I could not trace the disease to any distinct recognised injury that he had ever received. He never had any severe fall, wrench, blow, bruise, or other injury of the joint which the father could call to mind.

When examining his hips my thumb came in contact

with his penis, which became erect almost immediately, and presented an exceedingly curious appearance. The penis was quite large, but very short, and had a long worm-like projecting prepuce, with an exceedingly small orifice, which admitted a small probe for nearly half-an-inch before the glans was reached. Anxious to know whether this condition of the genitals was connected with any loss of muscular power in the lower extremities similar to the case of Dr Sims, I asked the father whether he was active and spry on his feet previous to his getting lame, and he replied that he was the clumsiest boy he ever saw, in fact he was tumbling down all the time. That he had always to hold his hand when he walked in the streets, or he would be almost sure to tumble on the curbstone at every corner. His father said he had scolded him about his falling a hundred times, as he thought 'his clumsiness was owing to his carelessness.'"

In the light of his former cases, Dr Sayre argues that the starting-point of the local mischief might be ascribed to a fall, owing to the muscular debility induced reflexly, and the initial lesion becoming aggravated by a succession of falls. On making the discovery of the preputial irritation in this case, he proceeded to examine the other two, and to his surprise "found them almost counterparts of the one just described, both in their history and in the appearance of their genital organs, except that the prepuce, instead of having a worm-like elongation, was unusually short and attached to the glans, nearly to the orifice of the urethra, which was reddened, and its mucous membrane swelled like a granular urethritis. The least irritation would produce an almost instantane-

ous erection. In these two latter cases the prepuce was easily torn back with the thumb and finger nails, and the concremented smegma, which was impacted behind the corona, carefully removed. This slight operation, together with cleanliness and frequent moving of the parts to prevent adhesions, answered all the purposes of circumcision, and at once quieted the nervous irritability."

I offer no apology for thus giving considerable prominence to the foregoing cases. I attach to them immense importance, as disclosing, possibly, a frequent source of infantile paralysis, and the numerous indications of nervous irritability in childhood, while, so far as known to me, Dr Sayre's cases are unique in medical literature.

No one will fail to be struck with the analogies presented by his first case to the manifestations of genuine epilepsy. I am persuaded that due importance is not attached to peripheral irritation in these cases as an element of nervous disturbance. What may be called traumatic cases of epilepsy, are frequent enough in medical practice; epilepsy, for example, from gastric or hepatic irritation.

Looking at Dr Sayre's cases, and the closely analogous functional aberrations of the genito-urinary organs, it is not at all improbable that unsuspected irritation of the pelvic organs may be more frequently a factor in the production of epilepsy than is at present surmised.

This idea receives corroboration from the beneficial results which have followed castration as a cure for epilepsy. Thus, Dr Mackenzie Bacon removed both testes from a lad, believing that epileptic fits from which he was suffering were to a great extent kept up by

sexual excitement. Before the operation the patient had a great number of fits, and was seldom more than two or three days without a series of them. Dr Mackenzie Bacon tabulates the number of fits patient had after the operation. It is unnecessary to reproduce this table; suffice it to state, that "the fits have been greatly diminished in frequency by the operation, and the general condition of the patient has also much improved. His intelligence has increased, he is lively and better behaved, and able to be employed usefully. He is probably now as well as his mental condition will ever permit him to be, and I think no one can refuse the conclusion that he has benefited by what has been done for him."

But wherein, I would ask, does the performance of this operation differ from clitoridectomy in the opposite sex? Is satyriasis a mental disease? Is epilepsy in females due to masturbation, as is believed to be the case in males? To my mind there is no difference in the operation relatively, and if castration in the male is, under peculiar circumstances, justifiable, excision of the clitoris in the female under like circumstances must be equally justifiable. The conditions being parallel, there is a parallelism in the operation. If the fact be admitted that the proximate cause of certain forms of epilepsy—the immediate cause being cerebral anæmia—is peripheral irritation, and that it is irremediable by the ordinary resources of our art, it becomes a momentous question whether it is not preferable entirely to emasculate the unfortunate victim of epilepsy in the male sex, than to allow progressive mental miseries, leading possibly to dementia, to go on unchecked; or in the female to remove an organ which exerts no in-

fluence over procreation so far as known ; and if Mr Baker Brown—a gentleman confessedly an accomplished surgeon—had selected his cases with due regard to the indications justifying such a procedure, as Dr Mackenzie Bacon had done in the male, the harsh treatment to which he had been subjected would require the *odium medicorum* alone to explain.

Human nature ! given a man down, how universal the kicking ! Every rogue passing by stops to take his turn. The pastime is characteristic of certain sections of all professions. Would that I could draw aside the veil which obscures the worse than Paphian temples, where the votaries of instrumental prostitution crowd to worship. Here one “observer,” taking the altitude of an ulcer of the os, which has existence only in his own brain ; there another dangling the uterus on a “staff,” like a hare-bell on a herdboy’s sprig ; but these gentlemen are “scientific” practitioners of medicine, and as such are applauded !

That uterine diseases requiring manipulative interference are occasionally met with, I am not prepared to deny, but I am unshaken in my persuasion, that they are vastly exaggerated, so far as the frequency of their occurrence is concerned, and the importance to be attached to the most trifling deviations from what it is convenient to assume to be the normal position ; nay, I will go further, and assert that uterine pathology is the most fertile field of quackery, and the most profitable which can be cultivated. Between the insane prurience on the one hand, and too frequently the *salacitas aurea* on the other, theoretically, I would not for a moment hesitate to pronounce.

But the operation of clitoridectomy did not originate

with Mr Baker Brown. As early at least as 1822, it was recommended by Dubois as a remedy in cases of nymphomania; and it was resorted to with success by Dr Graefe of Berlin, in that year, under the following circumstances. The patient was born in the year 1807, and was a strong healthy child until the age of 14 months. At this time she was attacked with vomiting and fever; after recovering from the acute symptoms, she still continued weak and sickly; she could not walk until she was four years of age; she was unable to talk, and, in short, exhibited unequivocal marks of idiocy. All the remedies which were employed were unavailing; and as she advanced in years, her imbecility and her brutal propensities became more marked. She delighted in swallowing dirt and ordure; and she would stand for hours together in a fixed position with her tongue hanging out of her mouth, from which the saliva flowed in copious streams. She was fourteen years of age when the physician who published this case first saw her. He soon perceived that the girl had an insatiable propensity for self-pollution, which she performed either by rubbing her extremities on a chair, or by the reciprocal friction of her thighs. Since this time there could be no doubt as to the principal object to be aimed at in the treatment of the case. A bandage was applied capable of preventing friction in the sitting position, in which attitude she chiefly indulged her prurient propensities; a straight waistcoat was put on her at bed-time, and counter-irritation by the application of a hot iron in the neighbourhood of the part affected, was resorted to. These means, with the use of tartar emetic, the dose of which was gradually increased to a scruple, produced little

effect. At the end of about a twelvemonth the excision of the clitoris was determined upon, and this operation was performed by Dr Graefe, on the 20th of June 1822. After the cicatrisation of the wound, a marked amelioration of the symptoms was observed. The propensity to self-pollution was nearly eradicated; a few suspicious motions, the remains of a long-continued habit, were occasionally observed, but these were at length discontinued. The intellectual faculties of the patient began to develope themselves, and her education could now be commenced. She can at this time talk, read, reckon accounts, execute several kinds of needle-work, and a few easy pieces on the pianoforte.

It is a remarkable circumstance that this young girl, on emerging from the normal lethargy in which she had been sunk from infancy, assumed at once, without any intervening gradations, the character and tastes of adolescence.—*Revue Médicale*.

Again, Richerand relates the case of a young woman so violently affected with this disease (nymphomania) as to have recourse to masturbation, which she repeated so frequently as to reduce herself to the last stage of marasmus. Though sensible of the danger of her situation, she was not possessed of self-command enough to resist the orgastic urgency. Her parents took her to Professor Dubois, who proposed an amputation of the clitoris, which was readily assented to. The organ was removed by a single stroke of the bistoury, and all hæmorrhage prevented by an application of the cautery. The wound healed easily, and the patient obtained a radical cure of her distressing affliction.—*Nosographie Chirurgicale*.

Looking back on the ground, so to speak, which we

have traversed, we find that nocturnal enuresis and its prototype, spermatic incontinence, have pathologically occupied our attention, as likewise hysteria, reflex or traumatic epilepsy, and the very interesting subject of reflex paralysis, as illustrated by the important cases narrated by Dr Sayre of New York, and other kindred subjects. We have seen that in each of these diseases a disturbance of nervous co-ordination is the immediate factor in their production—the remote being different in each. We have likewise shown that the balance of nerve force, or *equipoise*, may be disturbed from two poles—the somatic and the psychical. And it has been made manifest that, in the case of the disease which first engaged our attention, enuresis, it is of a twofold variety,—the one due to involuntary spasm of the detrusor fibres of the bladder, of centripetal, or centrifugal origin—what might indeed be called *sthenic enuresis*; the other, a variety of this affection due to structural changes in the sphincter vesicæ, whereby any considerable accumulation of urine is incapable of being retained in the viscus, and what might, in *contra-distinction* to the other, be termed the *asthenic variety*. In considering the etiology of the first variety, its causes have been ascribed to the presence of ascarides, stone, preputial irritation, and those cases where, probably from hyperæsthesia of the bladder, or acrimony of the urine from mal-assimilation, an impression is made upon the brain, whereby the functional necessity of micturition is presented to the central organ, and in which the act may then be considered rather voluntary than involuntary, though occurring during sleep. It will be obvious, therefore, that according to the cause diagnosed, so will the treatment be regulated.

Peripheral irritation, in the form of ascarides, will at once indicate the exhibition of anthelmintics, &c., of which there is a great variety; the presence of stone will call for surgical treatment; acrimony of the urine from mal-assimilation will yield to alkaline remedies, such as the bicarbonate of potash, &c.; preputial irritation may necessitate the performance of circumcision—an operation of which more hereafter.

Generally speaking, enuresis in children is of this variety, and the cause being removed, the bladder is functionally restored. It appears, however, that if the disease has been of long duration, in consequence of neglect, &c., an atonic condition of the sphincter is induced, and, consequently, a tonic treatment is indicated, in addition to the removal of the primary element of nervous disturbance; and sedative treatment to allay hyperæsthesia, which the lengthened presence of some local source of irritation may have induced. For the latter purpose hydrate of chloral, the latest panacea, has received much laudation in periodical literature. It will be obvious that its empirical employment is unsafe, for instance, in the enuresis of the aged, where, as a rule, the *error loci* consists in an atonic condition of the sphincter, demanding the very reverse of sedative treatment, viz., stimulation either by means of vesication, electricity, or by the exhibition of internal remedies which act as vesical stimulants. To hydrate of chloral, in cases where irritation alone has to be contended against, there can be no objection; but I am persuaded that for the purpose for which it is administered, in these cases it falls far short in efficacy to such old agents of our *materia medica*, as camphor, opium, belladonna, and hyoscyamus. But it is perfectly

justifiable, in cases where atony of the sphincter has supervened on general vesical irritation, to combine both a tonic or stimulating with a sedative treatment; and for the former purpose, though somewhat at present out of place, I may remark, that there is no agent of the *materia medica* in which my faith is stronger than in the tincture of the muriate of iron judiciously administered. It is absolutely an ultimate fact, that this valuable preparation acts not only on the bladder, but I believe the prostate gland, and the corresponding organs in the female. On this point we shall have more to say under the treatment of seminal incontinence. Pressure by means of bougies fixed in the urethra, and other mechanical means of curing enuresis, though anciently held in high esteem, are now properly discarded as a rule.

Confining still our observations more particularly to the enuresis of childhood, what may be termed the moral treatment merits attention. The bad habit is to be corrected by compelling children to pass water before sleeping time, and wakening them at one or more intervals, as the exigencies of the case may demand, during the night, in order to compel the performance of the act in its normal state. Hip baths will expedite the cure.

In some cases, in the adult, enuresis may be occasioned by catarrh of the bladder, independent of the presence of stone, as from the extension of gonorrhoeal inflammation by contiguity, or the forcible introduction of too strong injections into the bladder, as likewise from prostatitis from the incautious use of instruments, causing inflammatory irritation at the neck of the bladder. In cases of catarrh of the bladder,

great benefit is to be derived from the careful washing of the bladder* with tepid water simply, or in conjunction with small quantities of the permanganate of potash, a weak solution of the bichloride of mercury, or chlorate of potash, &c. Both the permanganate and the bichloride smart very severely, and the precaution to use them sufficiently diluted is a very necessary one. Sedatives may in certain cases be beneficially combined, though it is a mistake to believe that any quantity of a powerful narcotic may be introduced into the bladder, relying upon its non-absorptive power. And this brings us to a subject which possesses sufficient interest to merit somewhat detailed examination. I have certainly seen the constitutional effects of mercury thus induced; and as my case, on its publication in "The British Medical Journal" excited a good deal of interest, it may not be out of place to reproduce it here with some other matters which appeared in the same journal relative thereto. I quote it as it occurs in vol. i. of "The British Medical Journal" for 1869:—

In one of the lectures recently delivered and published by Sir Henry Thompson, "On affections of the urinary organs," the following passages occur:—"In circumstances of great pain you may inject anodynes into the bladder if you please, but they are of little value. And you need not be afraid of the quantity, for the mucous membrane of the bladder appears to have no absorbing power, unlike the neighbouring tissues which line the rectum."

The following case which has just occurred in my practice so thoroughly substantiates the fallaciousness

* An elegant instrument for this purpose is supplied by Maw, Son, & Thompson, of London.

of this doctrine, that I am induced to place it on record:—

M. M. C., a female, had been under my care for a short time in consequence of chronic cystitis. Having employed the usual constitutional treatment in the first place, but with no very decided benefit, I adopted the topical treatment recommended so strongly by the distinguished surgeon referred to, injecting acetate of lead and nitrate of silver after his method. My expectations not being realised, at least so promptly as I anticipated, I resolved upon injecting a weak solution of the bichloride of mercury, from which I have obtained the best results in other chronic inflammatory affections. Accordingly, I injected, on January 27th, about three ounces of a solution containing,* as I firmly believe, little more than a quarter of a grain of the bichloride. The patient then left my house, being desired to retain the solution in the bladder as long as possible. I was requested to visit her on the succeeding day, when, to my annoyance, she complained bitterly of the pain the last injection had occasioned her. *It was not retained in the bladder for over twenty minutes.* She stated that she had a most unpleasant taste in her mouth, “wersh,” as she termed it, or, in more familiar terms, a brassy taste; that† her gums were painful; and on examination, there was at least evident tenderness, and for two or three days afterwards she passed very little water, and then with very considerable pain. I need not say the statement of the subjective symptoms was voluntarily

*I am now somewhat suspicious that, as the result of an accident, the quantity of the bichloride was greater than above mentioned.

† The views here expressed have been recently confirmed by the researches of M. E. Alling.

tendered, and that the patient had not the remotest idea that the symptoms complained of were due to the treatment employed. The internal administration of anodynes relieved the pain, and I am hopeful that, notwithstanding the disagreeable consequences, improvement will ensue. With such a case as this in view, indicating as it does the great absorptive power of the bladder, I would be exceedingly chary of indiscriminately injecting anodynes into this organ. From this circumstance it will be obvious certain medico-legal questions might arise, and it is desirable that until Sir Henry Thompson's views are more conclusively established in respect to anodynes, his statements at all events should be received with reservation.

Such is my case as published in "The British Medical Journal," and the only comment I have now to make upon it is, that believing the solution to have been stronger than I then imagined, I must modify my belief as to the *great absorptive* power of this viscus, to one that it has absolutely absorptive power.

A correspondent of the same journal, with reference to the above case, communicated the following interesting note :—

"That the bladder is able, under special circumstances, to absorb the water from the urine contained in it I have no doubt, from an observation made in my own person. Some years ago I started for a walk of many miles along the sea-coast, and when near my destination I was about to pass urine, when I discovered to my consternation that my progress further was arrested by the jutting rocks. My attention was immediately diverted to my novel position, and for some time I was engaged in various schemes for my

extrication. As none were feasible, I was forced to remain an exile on the shore until the morrow allowed me to retrace my steps. It was near midnight when I suddenly recollected that I had been arrested almost in the act of micturition, and I thereupon emptied my bladder, but it was more from the idea of fulfilling a forgotten engagement than from necessity. My surprise was then great when I remarked that the quantity of urine was small, as I was sure, from my own feelings, that the bladder had some hours before been full. The physiological fact of the absorption of the urine, or at least of its aqueous portion, forced itself upon my conviction, and I have not the slightest doubt that this did take place. I should state that, having no food, my hunger was great and my thirst painfully distressing. Now, if the sense of thirst be due to the want of water in the system, its requirements were considerable in my case. Of course I cannot prove to a demonstration what amount of urine my bladder held at three o'clock, and what amount at eleven, but I know that the quantity was small at the latter time, and at the former my desire to micturate was as usual, after having had no relief since the early morning. I believe also, that I was the subject of another interesting physiological experiment—that my thirst was subsequently much alleviated by absorption of water from my wet clothes.”

This seems conclusive proof of the absorption of the watery portion of the urine even by a healthy bladder.

In the “Gazette des Hôpitaux” of March 7, 1868, M. Seglas admits the absorptive power of the bladder, as proved by experiments on animals; M. Demarquay,

as finding it very feeble ; and M. M. Russ and Susini, on the other hand, as denying it altogether, from experiments on healthy men.

Apropos of the controversy in "The British Medical Journal," the editor observes,—“A good deal of interest has been excited on the question of vesical absorption as a physiological phenomenon and therapeutical means, by the notes on the subject which have recently appeared in "The British Medical Journal." On Wednesday Sir Henry Thompson read Dr Black's recent note in the Journal to his class, in which he (Dr Black) calls in question the accuracy of his previous statement in public lectures, that there is practically no power of absorption resident in the living membrane of the bladder. To illustrate the fact, Sir Henry injected half a fluid ounce of liquor opii into the bladder of a patient. An hour afterwards there was not the least sign of narcotism.”

Dr Braxton Hicks contributed his views on the question at issue, at the same time, in the following manner :—“That absorption into the system of materials injected into the bladder does take place, was well seen in a case reported in my lectures on the subject, in 'The Lancet,' where eight grains of morphia were injected by mistake at one time, with marked symptoms belonging to the drug, but wonderfully out of proportion to the quantity employed. But this does not in any way militate against the use of injections into the bladder, because these are intended to be applied directly to the mucous membrane to restore its functions. In cases of over-sensitiveness, or of abrasion, &c., then the effect of morphia injections is well marked ; but the quantity of the fluid should be

small, and the dose of morphia not less than one grain. If more than an ounce of the solution be employed, the irritable bladder shortly expels it, and its effect is lost," &c.

My view of the matter received further corroboration from Dr Tilt, who wrote as follows :—"The result of Sir Henry Thompson's experiments on vesical absorption are so unexpected, that it would be desirable to know whether the liquor opii was injected into a healthy or a diseased bladder"—a difference which I previously suggested in a brief reference to Sir Henry's experiment in the following manner :—"What I contend for is, that my case *clearly illustrated the absorption by a diseased bladder of a mineral solution*. In the case on which Sir Henry Thompson experimented, nothing being said to the contrary, I suppose the bladder was one in a healthy condition. To reconcile the differences of opinion on this very interesting subject, I think it very probable that the absorption may be determined by certain pathological conditions, such as abrasion, &c. It is clearly manifest that the bladder does or does not absorb; and the observation and experience of such men as Sir Henry Thompson and Dr Hicks cannot be questioned so far as accuracy is concerned, and cannot be reconciled save on some such assumption as I have made."

Thus the question dropped. I am convinced that the bladder does absorb; I can believe that the absorption may be influenced on the one hand by the condition of the viscus itself, and on the other by the nature of the fluid so injected. I am persuaded that the injection of anodynes into the bladder is beneficial, while I maintain that their injudicious or reckless employment in *diseased* conditions of the organ is not

without risk; and it is certainly not necessary that they should be absorbed to act as local sedatives.

We have hazarded, as may be remembered, the belief that in certain cases of enuresis, so delicate is the adjustment between the two sets of muscles, that irritation of the detrusor set is apt to be followed by atony of the sphincter, and we have incidentally referred to the efficacy of the tincture of steel in these cases; in addition, the employment of the constant galvanic current, though it is more applicable to cases of paralysis of the viscus generally, occasioning retention, may be enjoined; as likewise blistering to the sacrum and perineum, or to the region of the sixth dorsal, for reasons to which we have referred above. Small doses of tincture of cantharides, failing other remedies, may be tried, with the prospect of benefit.

According to Goelicke, in a dissertation *de Trichosis*, published in Frankfort in 1724, there is a species of incontinence of urine due to the growth of hair in the bladder; the same species is described by Scultetus under the head TRICHIASIS. Sir Hans Sloane likewise mentions several instances of this nature,—one that of a brewer who voided long hairs from the urethra, without the attachment of little or any calculous matter. In vol. xii. of the “Philos. Trans.” Mr Powell relates a similar case in a lady. In several of these cases it has been surmised that the hairs grew from calculi in the bladder, from the fact that resistance had been offered to their extraction in cases where they suspended from the urethra. These cases, it need not be observed, are extremely rare, but the possibility of their occurrence should be known, as when least anticipated the curiosi-

ties of medical or surgical practice not unfrequently turn up. Should the presence of any such source of irritation be suspected, frequent washing of the bladder, possibly with some antiseptic preparation, will yield the best results.

It will be sufficient to mention that temporary incontinence of urine is a manifestation of various nervous affections, such as hysteria, hypochondriasis, or nervous excitement from whatever cause produced. It has been attempted to explain this occurrence, in such cases as hysteria, on the supposition that spasm of the capillary vessels of the skin takes place, and that consequently containing less blood than usual, more work is imposed upon the kidney. We do not think this a satisfactory explanation. It is much more probable that the kidneys participate in increased work, in common with the various other secretory organs, owing to the accelerated circulation which the excitement produces. This is the *diabetes insipidus* of some writers, and is not necessarily associated with any organic change in the bladder; it is only a temporary inconvenience, and is referred to not as a disease, but as an interesting physiological occurrence. Dribbling of urine occasions, unless precautions be adopted against it, excoriations on the thigh and adjacent parts, causing great annoyance. To obviate this, and the urinous smell which is so offensive, a great variety of urinals is constructed, both for male and female, which may in any case be used with comfort and benefit. Patients are often naturally inquisitive regarding diet. *Bon-vivants*, particularly aged ones, are unwilling to be denied the comforts of the festive board. As a general rule, it may be laid down that any diet calculated

to surcharge the urine with solid matter, irritate the kidney, or stimulate it to preternatural secretion, should be avoided. Consequently the diet should be plain, solid, and nutritious, making up in quality what is wanting in quantity, due care being taken that a tendency to an excessive formation of oxalic, or uric acid should be prevented by the judicious blending of a vegetable with an animal diet. Ardent spirits are, in my experience, injurious, as well as malt liquors, in consequence of their diuretic effects.

That species of incontinence which is associated with affections of the spinal cord, and which is more frequently seen in patients who have resided in tropical climates, is less amenable to treatment, and must be treated according to the indications of the existing case in hand.

Turning now to the treatment of the analogous affection which we have already considered to a sufficient extent, viz., spermatic incontinence, we have arrived, it will be remembered, at the conclusion that, like enuresis, its disturbing element may be either somatic or psychical. We confine ourselves, in the meantime, to the former. Nervous distribution to the bladder and the reproductive organs is so intimate that it will readily be conceived that what disturbs the one is most likely to disturb the other; and, while this holds good pathologically, it is equally true in a therapeutical point of view. Hence the observation that children who have been liable to nocturnal enuresis are more liable than others to seminal incontinence during adolescence. A little reflection on the anatomical relations of the parts in question will show how this should be. Ellis regards the prostate as "essentially a muscular body,

consisting of circular or orbicular involuntary fibres, with one large central hole for the passage of the urethra." The circular muscular fibres of the prostate are continuous behind with the middle or detrusor fibres of the bladder. These fibres Ellis proposes to call the *orbicularis vel sphincter urethræ*. Again, the external or *detrusor urinæ* fibres of the bladder spread out upon the surface of the prostate gland, forming its external muscular coat, while the longitudinal fibres of the bladder constitute an internal muscular coat of the prostate. The anatomical connection is thus most intimate. Further, we have seen how intimate the connection of these parts is with the brain, through the abundant distribution of the branches of the sympathetic and sacral plexus. Involuntary spasm of the prostate, passing back through the ejaculatory ducts to the *vas deferens*, and *vesiculæ seminales*, may thus have an intimate connection with involuntary seminal emission. Indeed, it is highly probable that the initial part of this reflex act does so take place. We have referred above to that property of the law of reflex irritation, whereby the vaso-motor nerves of a part are influenced through the nervous centres, causing first, temporarily, partial nervous paralysis, congestion, and ultimately, if preternaturally protracted, inflammation, which is more likely to become chronic in vascular bodies. The emission of semen, we have seen, is a reflex act. Irritation, beginning at the glans penis, is transmitted through the spinal cord and brain to the prostate, *vesiculæ seminales*, *vas deferens*, and the testicle. In the normal condition of the parts a certain interval elapses before reflex action is established, but given a certain amount of irritation in any of the organs

mentioned, and in a direct ratio is reflex action anticipated. Of this we shall have more to say in the sequel. Abuse of the genital functions will, in obedience to the law of reflex excitation, give rise to irritation, the result of a sub-acute or chronic inflammation in the organs thus preternaturally excited; hence, in the vast majority of instances of spermatic incontinence, chronic prostatitis is present as a pathological condition.* This is made manifest by the passage of a bougie or catheter, when the instrument, on passing over the prostate, will be found to occasion more or less pain according to the severity of the case. We know that when the orifice of any duct is unduly irritated, excessive secretion, by the gland, is stimulated. We may therefore safely infer from analogy that prostatitis, by the extension of

* My friend Mr J. B. Hislop, F.R.C.S., of Glasgow, informs me of the case of a young gentleman who consulted him regarding the occurrence of seminal emissions to such an extent as to affect his health, and consequently occasion mental annoyance. Mr Hislop advised marriage. His patient got married; his wife became pregnant, but still the emissions persisted. An examination of the urethra was thereupon instituted, when intense tenderness was found to exist in the back part of the urethra; so intolerant was the prostatic region of the passage of the catheter that considerable hæmorrhage ensued. Patient acknowledged an indulgence, for a short time, in the practice of masturbation, in which he was initiated by no one, but, like Rousseau, ascribed the feelings which originally prompted to its performance to maternal chastisement administered *ad posteriorem*. "Qui croiroit que ce châtiment d'enfant, reçu à huit ans par les mains d'une fille de trente, a décidé de mes goûts, de mes désirs, de mes passions, de moi pour le reste de ma vie, et cela précisément dans le sens contraire à ce qui devoit arriver naturellement? En même temps que mes sens furent allumés, mes désirs prirent si bien le change, que, bornes à ce que j'avais éprouvé, ils ne s'avisèrent point de chercher autre chose. Avec un sang brûlant de sensualité presque dès ma naissance, je me conservai pur de toute souillure jusqu'à l'âge où les tempéraments les plus froids et les plus tardifs se développent. Tourmente long-temps, sans savoir de quoi, je dévorais d'un œil ardent les belles personnes, mon imagination me les rappeloit sans cesse, uniquement pour les mettre en œuvre à ma mode, et en faire autant de demoiselle Lambercier" (Rousseau, "Confessions," partie i. livre i. p. 1039).

the irritation thus caused, and its extending by contiguity through the vesiculæ and vas deferens, will stimulate the testicles to increased seminal secretion; and when the vesiculæ are full, the condition of the prostate offers less resistance, and hence seminal emission will become abnormally frequent.

We have remarked above that, for practical purposes, irritation from diseased conditions of the testicles, vesiculæ, and urethra may be disregarded, inasmuch as in the vast majority of instances the seat of the disease lies in the prostate. Failing its being discovered there, in any case, an examination of the other organs should in these rare instances be instituted. Sthenic and asthenic conditions of these organs have been described with the characteristic symptoms common to each variety. It seems scarcely necessary to remark that the one is but an advanced stage of the other, and that the refinement of classifying symptoms which define their limits, seems to me the merest creations of the imagination, of which this subject is truly too prolific. John Hunter remarked that diseases of the vesiculæ were frequently talked of, but that he never knew one, leading to the inference that he was a disbeliever in their occurrence. While admitting their great rarity, it would be going too far to homologate this opinion of the eminent physiologist. *Post mortem* evidences of diseased conditions of the vesiculæ are unquestionably met with occasionally. These comprise inflammation, preternatural dilatation, thickening, and sometimes a purulent discharge, as from abscess, &c. According to Kolliker, chronic catarrh of the vesiculæ is sometimes met with in advanced age, "accompanying mechanical hyperæmia of the pelvic veins, stasis, varicosity, and the

formation of phlebolithes ; as a consequence of chronic vesical catarrh, as a result of repeated gonorrhœal catarrh of the urethra and the neck of the bladder, of excessive venery, and especially of masturbation."

Persistent inflammatory irritation of the vesiculæ may occasion their obliteration by means of the exudation of organisable lymph, and thus interfere with their functional uses.

One of these rare cases of vesicular disease is related by Mr Acton, as occurring in the practice of Dr Henry Bennett; and Howship likewise relates one complicated with spasmodic stricture and disease of the prostate. From the general feel of the parts, he remarks, on their removal, it was presumable the prostate was enlarged. But the careful and patient dissection of the parts at length completed, proved that the whole tumour was the result of a very enlarged and indurated state of the left vesicula seminalis. Its texture was firm as a 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 vesiculæ were exceedingly thickened. The cellular cavities within, much enlarged, were filled with 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.

It would appear with respect to their development,

that the vesiculæ have a direct dependence on that of the testicles; thus as the testicles are deficient or absent, corresponding conditions are found in the vesiculæ; while, on the other hand, in those rare cases in which supernumerary testicles exist, the vesiculæ are said to be increased in number.

While it is therefore proper, that the existence of diseased states of the vesiculæ should be sought for, in the absence of other local irritation or disease, it assuredly cannot be said, that these conditions exist in such frequency, as to merit their enumeration among the ordinary causes of spermatic incontinence.

In addition to these pathological states, there is yet another condition, which, according to my experience, contributes largely to occasion spermatic incontinence, I refer to congenital phimosis. In such cases as have come under my notice, I believe I am safe in asserting, that in three-fourths of them, a preternaturally tight prepuce covering the glans existed. In consequence of this condition, sebaceous matter accumulates beneath the prepuce, and reflex irritation is thus set up.

The psychical conditions which tend to occasion spermatic incontinence we have already considered; and having thus referred to the most important etiological factors in the production of the disease, we proceed to consider the treatment indicated.

Treatment.—The rational treatment of any given disease must be based on a correct appreciation of its cause, and an intelligent knowledge of the properties of the remedial, or accessory agents employed with a view to its cure. Having satisfied ourselves in the cases under consideration, that spermatic incontinence

actually occurs to such an extent as to constitute a pathological state, we naturally proceed to investigate its cause. It will be the duty of the physician to inquire into the habits of his patient. Should the practice of masturbation be indulged in, it will be obviously futile to resort to remedial measures until it be discontinued, and this it need scarcely be remarked lies with the patient himself. It is a mistake to suppose that this pernicious practice is confined to youth; as men at the middle periods of life have confessed to me an unfortunate propensity to its indulgence, particularly under the influence of drink. In cases in which an almost irresistible propensity to it occurs, the penis must be freely blistered, so that the habit may be broken off; and moral means must necessarily be conjoined with the surgical treatment.

But if the exciting cause have been abandoned, and the emissions still persist to an injurious extent, an examination of the urethra should be instituted. For this purpose a catheter or bougie is passed, when, in the large majority of cases, intense prostatic hyperæsthesia is found to exist. In the remaining proportion of cases the irritation is not so acute; or little or no pain is felt, and we infer the existence of some other cause, or that a relaxed condition of the prostate has supervened upon the long continued irritation. This is peculiarly characteristic of chronic, and more aggravated cases, and is most likely to be accompanied with diurnal pollutions. These conditions satisfactorily proved to exist, the indications of treatment are obvious, viz., to allay irritation, and restore their pristine tone to the affected parts. In the cases of extreme prostatic irritation, there unquestionably exists the condition we

denominate inflammatory. There is more or less congestion of the prostate, probably effusion of fibrine in the gland and consequent enlargement ; and ample experience has shown that the physiological effects we call into operation by the process of blistering, is the most efficacious for the removal of such states, and it is also admitted that blistering is more efficacious applied to, than remotely from the affected part. But the prostate is beyond the reach of blistering in the ordinary acceptation of the term, and we consequently resort to the introduction of a convenient agent into the urethra for this purpose. Reasoning from analogy, it was inferred from the beneficial effect of nitrate of silver in chronic conjunctivitis, that it might with equal benefit be employed in like conditions of the prostate, and hence its general adoption for this purpose. Its introduction is due to Lallemand, and confessedly not a little diversity of opinion still exists as to its efficacy, or propriety as thus employed. Like every other novelty, it is undoubted that cauterisation of the prostate has been pushed by its advocates to a mischievous extent. But it does not follow, granting that its indiscriminate employment has been attended even with serious consequences, that in certain cases its judicious employment is not to be enjoined. "Desperate diseases are by desperate measures cured." Hence the employment of the solid caustic must be left to the judgment of the medical attendant.

The following case in point may be quoted. So long ago as October 1837,* Mr James Douglas, lecturer on

* As I am not aware that the paper of this accomplished surgeon was ever printed, it may be interesting to present an outline of it in this place, taken from Mr Douglas's manuscript. The paper is entitled, "On Spermatorrhœa or

anatomy in the Portland School of medicine, Glasgow, read a paper before the Glasgow Medical Society, on spermatorrhœa, giving an account of Lallemand's opinions, and the history of a case which occurred to himself. The patient, who was a medical man, was so impressed with the truth of M. Lallemand's doctrine,

Involuntary Seminal Emissions, by James Douglas, A.M., Member of the Faculty of Physicians and Surgeons of Glasgow, and Lecturer on Anatomy," and bears date 1837. Mr Douglas begins his subject, just as the evils rampant in our midst compel one to refer to the subject at present.

"The subject of profuse seminal evacuations, is one which has too little occupied the attention of medical practitioners, partly from a false delicacy, deterring them from its investigation, and partly from a fear of identifying themselves with those shameless quacks, whose puffs disfigure so disgracefully so many columns of our advertising papers. That there is such a disease the existence of these quack lucubrations sufficiently proves; and that the unhappy sufferers are too often tempted to seek from their authors that relief which has not been obtained elsewhere, is sufficiently evident from their extensive circulation, and the offensive way in which they are constantly obtruded upon the public eye. Why then should the regular surgeon or physician hesitate to make himself acquainted with the symptoms, causes and pathology of this disease, and give his patients the benefit of rational treatment founded upon this knowledge, instead of abandoning them to the misdirected efforts of unprincipled empirics?

"It has been long well known that indulgence in venereal excesses produces direct debility, both from the actual abstraction of the seminal fluid, and from the nervous exhaustion following the excitement of ejaculation. It has also been known that when emissions have been excited by masturbation, the effects have been much more serious, partly from the unnatural way in which the excitement has been applied, and partly from the age of the subjects who have been addicted to it, enabling them less easily to bear the shock produced upon the nervous system. It has been long known too that such habitual irritation of the genital system has caused spontaneous erections and emissions during sleep, which tended much to the weakening of the unfortunate subject; but only lately has attention been called to the fact, that it may induce frequent evacuations of semen along with the urine, or when at stool to such an extent as to destroy completely, and even to compromise the life. Slight hints of the nature of this disease are to be found in the writings of Hippocrates and of several other practitioners in later periods, under the name of *Tabes Dorsalis*, but the absurd notion of a wasting of the spinal marrow led to an erroneous mode of treatment, and rendered the curative effects ineffectual.

that he visited Montpellier, and was operated on by Lallemand himself. By this operation he was greatly benefited, the discharge from which he suffered having become much less frequent. He persuaded Mr Douglas some months afterwards to repeat the operation, which he did, when renewed improvement ensued, although

“Wickman, a German, published a small tract about twenty years ago, which attracted scarcely any notice, and it was left for the celebrated Lallemand of Montpellier to investigate its nature with accuracy, and to plan its cure with success.

“About eighteen months ago, I observed in the ‘Revue Medicale’ a notice of Lallemand’s book, ‘Des Pertes Seminales Involontaires,’ then just published, and was struck with a description of a malady of which I had never heard before, I recommended the work for the Faculty Library. I very soon had occasion to discover the symptoms of the disease in a very intimate friend, a medical man, whose case I watched for some months, and who this summer visited Montpellier, and was treated by the Professor himself. . . . The essential of the spermatorrhœa then is, the evacuation of the seminal fluid frequently, involuntarily, and even unconsciously, without erection or pleasurable feeling; the *vesiculæ seminales* acting in concert with the bladder on the one hand, and the rectum on the other. The proximate cause of their contraction may be actual inflammation or ulceration of the orifices of the *vasa deferentia*, inflammation, or an irritable state of the mucous membrane of the prostatic portion of the urethra, or neck of the bladder, or a similar state of the mucous membrane of the rectum, aided by the direct pressure of hardened feces. The more remote causes are more varied. Thus the urethral irritation may depend on venereal excesses, masturbation, repeated gonorrhœas, and stricture, and in most cases the history of the patient leads back to some of these, occasionally of pretty ancient date. Sometimes it may depend on sudden and severe exposure to cold, and sometimes on the co-existence or retrocession of cutaneous diseases. The irritation of the rectum again producing violent contractions which are readily communicated to the *vesiculæ* lying in front of the gut, may depend on constipation, hæmorrhoids, mechanical obstruction, or even on the presence of ascarides.

“The symptoms which really constitute the disease are frequently unobserved by the patient; and the medical man is consulted on account of symptoms denoting indigestion, derangement of the liver, hypochondriasis, or even serious affections of the brain. This last simulation appears to be the most common, and indeed Lallemand declares that most of the patients in whom he recognised diurnal pollutions were recommended to him for advice on supposed cerebral diseases, on account of the celebrity he had obtained by the

Mr Douglas adds, the discharges have never entirely ceased. Mr Douglas, in this paper, further advised the injection of opium and acetate of lead into the back part of the urethra.

The solid caustic is to be recommended only in the most aggravated cases of spermatic incontinence; and just as they are removed from this condition, nitrate of silver in solution, of varying strength, may be applied to the prostate by means of a prostatic syringe. Yet in a considerable number of cases even these measures are not demanded, it being sufficient simply to pass a bougie or catheter at given intervals. This treatment is to be employed in those cases where hyperæsthesia alone is believed to be the *origo mali*. With it, however, the administration of genito-urinary stimulants and sedatives must be had recourse to. This applies

publication of his work, 'On the Pathology of the Brain and its Dependencies.'

"The patient generally appears exceedingly feeble and emaciated, his skin dry, wrinkled, and dirty looking, his colour gone, his eyes dull, sunken, and surrounded by a dark areola, while his manner and address imply great anxiety. He complains, probably, of derangement of the stomach and bowels, inability to take strong food or drink, habitual constipation, and distension of the bowels with flatus. He informs you that coitus has become impossible with him, erections being very rare and imperfect, and the semen being almost immediately expelled. His mind broods constantly over his malady, he becomes peevish and morose, flies from society, and falls into a deep melancholy. He complains finally of mental weakness, inability to direct his thoughts, loss of memory, ringing in his ears, dazzling of the eyes, and *muscæ volitantes*, fainting fits, and flowings of blood to the head, resembling apoplexy, but differing from it, not being benefited by measures of depletion."

Mr Douglas then proceeds to the consideration of treatment, and after general remarks recommends Lallemand's method. He quotes cases from Lallemand's book, illustrating the efficacy of the treatment. The most interesting case in the paper, however, is that of his medical friend W. C., aged 28, who markedly improved under the treatment of caustic. The account is given by the patient himself, and possesses more interest inasmuch as it is the case of an intelligent medical man.

more particularly to those cases in which a relaxed condition of the prostate is believed to exist, as distinguished by the absence of orgasmic sensation during sleep, and other indications of greater debility.

Of the former, there is no agent in the *materia medica*, in whose efficacy my faith is stronger than in the tincture of the muriate of iron. It is absolutely, in my opinion, an ultimate fact, that this agent exercises a powerful tonic influence over, not only the genito-urinary organs in the male, but the vagina, uterus and bladder in the female. Of the latter, I prefer camphor, opium, and hyoscyamus or belladonna in combination, as in the following case.

On the 10th March last (1870), I was consulted by a medical student, aged 17, who was much annoyed by the frequent occurrence of involuntary seminal emissions, to the extent of two a night. He asserted that he felt weakened in consequence, and mentally worried. The case being one not demanding surgical interference, was put simply under medical treatment of the following nature :—

℞ Pulveris camphoræ, gr. xviii.
Pulveris opii, gr. xij.
Extracti hyoscyami, quantum sufficit ut fiat massa,
et divide in pilulas, xij.

Signatur. One pill to be taken at bed time : and forty minims of the tincture of steel to be taken three times daily in a wine-glassful of water.

About a fortnight afterwards patient called upon me, delighted to find the cause of much annoyance to him removed.

I was consulted by another patient regarding a similar affection. This young man had been in the hands

of London quacks, and his letters indicated a mental impression little short of actual insanity. Dec. 28th 1867, he writes—"I have emissions almost every night ; sometimes twice a night. It is about two years since I suffered from them." Patient had been addicted to masturbation, which, however, he had at this time abandoned. I put him under the above treatment, advising that the dose of the tincture of steel should be increased gradually to ninety drops thrice daily. On the 28th March patient writes—"I have had only one emission during the last thirty-three days. I am at 120 drops (of the tincture) now, and am quite cheerful at present."

It may be observed with respect to the employment of the tincture of steel as a genito-urinary tonic, that the dose as usually prescribed is much too small. Where smaller doses have failed, I have seen such large doses as the above productive of benefit. Of course it is not to be given in a concentrated form ; and it must be sufficiently diluted with water. It is well to use precautions against the effect on the teeth, such as sucking the fluid through a glass tube, &c. ; and again, though at the commencement, constipation, which may be obviated however by the administration of an ordinary aperient pill, is apt to happen, when the system becomes saturated with the tincture, the bowels become rather loose than confined, and the flow of urine is much augmented. Theoretically it has been urged that large doses of tincture of steel are useless, as so much of it passes off by the bowels. To this I have simply to remark, that I charge myself with a more than ordinary scepticism as to the value of observation and experience, but that in this regard I have seen

the benefits so often repeated that I have been constrained to add this one to the small repository of medical facts in which I acknowledge belief.

Dr Bradbury, of Cambridge, referring to this subject, remarks—"Whenever, therefore, there is reason to believe that nocturnal urinary and seminal incontinence are due to spasm (not the result of reflex irritation reflected from a fissured anus, worms, urinary calculi, congenital phimosis, or of structural disease of the walls of the bladder, &c.), hydrate of chloral will be found a most serviceable drug in their treatment, in consequence of the acknowledged efficacy of this drug of allaying spasm, as observed in tetanus and other spasmodic disorders." My belief is that no abnormal spasm ever takes place without some primary irritation. Is there no irritation in tetanus? Does the removal of the testicles in certain cases of epilepsy, by the improvement that ensues, not indicate the removal of at least a factor in the production of the disease? Is epilepsy not sometimes ascribed to masturbation? Is hysteria not associated with peripheral irritation?

Hydrate of chloral must be looked upon simply as a sedative, and doubtless, in suitable cases, its employment will be beneficial.

I have not been able to decide between the relative efficacy of hyoscyamus and belladonna in such combination as I have alluded to. They are so similar in action that this must be to a great extent conjectural; and one or other may be used as particular indications may seem to determine.

Recently the administration of bromide of iron has been recommended, and it may be inferred from its composition that it is worthy of trial. It may be given

in doses varying from five to ten grains. Bromide of potassium has been held in high repute as an anaphrodisiac, as well as almost for everything else. It unquestionably exercises a sedative influence over the nervous system, and its use is consequently indicated in such cases of the affection under consideration as present marked symptoms of genital hyperæsthesia. Phosphorus has likewise been recommended, and employed probably on the theoretical presumption that there may exist defective nutrition of the nervous system. Of its use I have no experience. It may be given in form of pill made up with crumb of bread in doses of from gr. $\frac{1}{2}$ to gr. j.

Strychnine, as a nervine tonic, has likewise been employed. I have used it singly, but I am not satisfied that it possesses anything like the special efficacy of the tincture of steel. In combination with the latter it may be beneficially employed, as also quinine. From its action upon the uterus in the parturient state, ergot of rye has been employed in cases of spermatic incontinence. It does not seem to have met the anticipations of its advocates, and has therefore fallen into desuetude. Sigmund of Vienna strongly recommended lupulin. As a sedative, there can be no objection to its employment. Stimulating diuretics, such as nitrate of potash, squills, &c., are contraindicated. Of the use of copaiba and cubebs in this affection I have no experience, the fact being that it is not my custom to resort to other agents, when I find remedies capable of accomplishing the intended object. Certain mechanical means have been resorted to for the prevention of involuntary seminal emissions. One form, a leather ring armed with sharp points, is placed

round the penis, its object being to awaken the patient when the penis becomes erect. The use of any such instrument is unscientific, and frequently totally unnecessary. When there is a tendency to self-pollution during sleep, blistering the penis is more efficacious. Another mechanical device consists in tying some prominent body, such as a "cotton reel," by means of a belt over the small of the back, as by lying on the back emissions are very prone to happen.* To this there can be no objection. Sedative suppositories, such as of belladonna and opium, may be beneficially employed in some cases. Blistering of the perineum has been recommended, but it is a measure of questionable

* It is remarkable to what an extent mental impressions may exercise a curative influence, and how somatic disturbance, primarily due to psychical causes, may be removed by antagonistic impressions of the latter nature. In his interesting and highly instructive work, *L'ONANISME*, Tissot remarks—"Comme l'habitude a ici une très-grande influence, et qu'il importe de la rompre, l'observation suivante pourra fournir un moyen d'y réussir. Je la tiens d'un Italien, respectable par ses vertus, et l'un des plus excellents hommes que je me rappelle d'avoir vus. Il me consultait pour une maladie très différente : mais afin de mieux m'instruire, il me fit toute l'histoire de sa santé. Il avait été incommodé, cinq ans auparavant, de pollutions fréquentes qui l'épuisaient totalement. Il résolut fortement le soir de se réveiller au premier moment où une femme frapperait son imagination, et s'occupa long-temps de cette idée avant que de s'endormir. Le remède eut le plus heureux succès : l'idée du danger, et la volonté de se réveiller, unies étroitement la veille à l'idée d'une femme, se produisirent, au milieu du sommeil, en même temps que cette dernière ; il se réveilla à temps, et cette précaution, réitérée pendant quelques soirs, dissipa le mal." By a strong resolution of the will the patient thus wakened in time to prevent seminal emission, and thus the habit was ultimately overcome.

In his highly interesting work "*On the Intellectual Powers*," Dr Abercrombie relates that Dr Reid cured himself in like manner of a tendency to frightful dreams, with which he had been annoyed from his early years. He did so by endeavouring to fix strongly on his mind the impression that all such dangers in dreams are purely imaginary, and determined whenever, in a dream, he found himself on the brink of a precipice, to throw himself over, and so dissipate the vision. By persevering in this method, it is alleged that for nearly forty years he was never sensible of dreaming.

efficacy. The very extreme measure of transfixing the prostate by means of accucumpture needles is one which cannot be sufficiently reprobated.

In cases of very tight prepuce, or congenital phimosis, the propriety of resorting to the operation of circumcision cannot be too strongly recommended. If at the juncture of the mucous membrane with the skin the foreskin is thick or gristly, circumcision proper is advisable. To accomplish this, the foreskin is drawn slightly out, grasped in an ordinary dressing forceps, and removed with one sweep of the bistoury. Care must be taken not to remove too much, as the prepuce retracts greatly. The cut surface should be drawn together to facilitate adhesion. There are other methods of removing preputial irritation—modifications of circumcision—such as slitting the prepuce on its upper surface, forcible dilatation, &c., but perfect circumcision is to be preferred. The operation of circumcision is one of great antiquity, and whose performance is attended with many beneficial consequences. Thus, it has been clearly shown that among the Jews, who perform this operation as a religious rite, venereal diseases are much less frequently witnessed than among individuals with long prepuces. Circumcision was not originally performed as a sacred rite. Its commencement with the Jews originated unquestionably with Abraham; and Marsham is of opinion that the Hebrews borrowed the practice from the Egyptians. Among the Jews it was performed on the eighth day, with the Egyptians not until the thirteenth year, and then *on girls** as well as on boys!

* What this circumcision on girls be I cannot divine, unless it be the bar-

In Otaheite it is performed by slitting the prepuce on its upper aspect. Herodotus (book ii. c. 104) refers to the operation in the following terms:—"The inhabitants of Colchos, Egypt, and Ethiopia are the only people who from time immemorial have used circumcision. The Phœnicians and the Syrians of Palestine acknowledge that they borrowed the custom from Egypt. Those Syrians who live near the river Thermodon and Parthenius, and their neighbours the Macrones, confess that they learned it—and that, too, recently—from the Colchians. These are the only people who use circumcision, and who use it precisely like the Egyptians. As this practice can be traced both in Egypt and Ethiopia to the remotest antiquity, it is not possible to say who first introduced it. The Egyptians certainly communicated it to the other nations by means of their commercial intercourse. The Phœnicians, who are connected with Greece, do not any longer imitate the Egyptians in this particular, their male children not being circumcised." Again, Gregory the Abyssinian priest remarks, "*infantes circumcidunt ob consuetudinem non ob Judaismum.*" Of the great antiquity of the operation there cannot therefore be a doubt, and it is very questionable whether it does not constitute one of the good ancient customs unfortunately become obsolete.

Galvanism has also its advocates in the treatment of spermatic incontinence, and upon the belief in its efficacy is based the imposition which takes the form of "The Self-adjusting Curative Belt," which is so extensively advertised in metropolitan and provincial

barous operation practised by the Nubian women on young girls. For a brief account of it *vide* "Lancet," August 10, 1867.

journals. That people will buy these appliances, painfully illustrates the crass ignorance by which the multitude is infatuated, and shows the necessity of legislating for the protection of people against their own folly.

With respect to the employment of galvanism, it is alleged that the induction current is of no use in the treatment of spermatic incontinence, while the constant current is highly beneficial. It should be transmitted along the vertebral column for one or two minutes, and repeated twice or thrice weekly.

We come now to the delicate and vexed question of sexual congress as a remedy for spermatic incontinence—a question on which distinguished members of the profession have delivered contradictory opinions, embracing grave moral considerations,* and one confessedly whose treatment involves extreme difficulty.

That sexual congress has been recommended by Lallemand, Benjamin Philips, Erichsen, and many others, will be sufficient to indicate that it demands consideration. I desire to approach the subject from a physiological and medical point of view—to elimi-

* Dante seems not to have considered incontinence in the extreme light of some of the modern philosophers—

“Dwell not in thy memory
The words wherein thy ethic page describes
Three dispositions adverse to Heaven’s will—
Incontinence, malice, and mad brutishness,
And how incontinence the least offends
God, and least guilt incurs? If well thou note
This judgment, and remember who they are,
Without these walls to vain repentance doomed,
Thou shalt discern why they apart are plac’d
From these fell spirits, and less dreadful pours
Justice divine on them its vengeance down.”

“Μετα δὲ ταῦτα λεκτέον ἄλλην ποιησαμένους ἀρχὴν, ὅτι τῶν περὶ τὰ ἥθη Φευκτῶν τρία ἴσθιν εἶδη, κακία, ἀκρασία, θηριότης.”—*Aristotle’s Ethics*.

nate entirely the consideration of moral or physical contamination, as I have no sympathy with individuals who make *a physiology* in order simply to reconcile it with preconceived dogmas. Let me not be misunderstood. I do not believe that physiology and morality jar, but it is my firm conviction that physiology and the artificial states of modern society openly conflict.

It will be conceded, in the first place, that the reproductive organs have been created, like every other part of the body, in anticipation of the performance of a given function. It will not be gainsaid that there is such a thing as sexual appetite or instinct, in the properly organised human being. Its power, doubtless, varies. "It is well known" (Ed. "Lancet," Nov. 11, 1871) "to be especially powerful in large classes who are called religious, but whose religion consists in submission to excited feelings, rather than a striving after purity and holiness of life. It has been very active in many men of great experience and of the highest reason, and seems, indeed, to bear some relation to the general force and vigour of the nervous system. It is quite true that men and women are under no necessity of sinning, and here and there a few may entirely control even strong sexual passions; but, as a matter of fact, the great majority of men do not so control them, and large numbers of continent women,* both widows and unmarried, suffer seriously

* Professor Frank of Vienna relates the case of a lady of his acquaintance, of a warm and amorous constitution, who was unfortunately married to a very debilitated and impotent man, and who, although she often betrayed unawares, by her looks and gestures, the secret fire that consumed her, yet, from a strong moral principle, resisted all criminal gratification. After a long struggle her health at length gave way; a slow fever seized her, and released her from her suffering.

in health from the forced suppression of an important function."

To quote once more from Feuchtersleben, he observes upon this point,—“The act of coition itself has a decidedly psychical effect. If exercised with moderation at full maturity, and at the right moment, it leaves (notwithstanding the *omne animal post coitum triste*), a pleasurable feeling. Nay, it invigorates the powers of thought, as shown by the example of the ingenious voluptuary Cassonova, who at such moments solved the most difficult mathematical problems. If not gratified when urgent desire exists, it may indeed occasion psychical uneasiness, and especially distract the attention."

Another argument adduced in favour of sexual congress is, that it is a law of our organisation that if any organ of the body is not functionally exercised, it wastes ; and hence it has been alleged that in continent individuals atrophy of the testicles and impotence are apt to occur. On the other hand, it is asserted that the testicles, like the *mammæ*, may remain functionally quiescent, and be roused to action as circumstances may determine.

Now, supposing we admit the first law, what does the admission amount to ? Simply this, that observation and experience amply show that atrophy of the testicles assuredly *does not* take place in continent young men, and that consequently the function of the testicles continues to be uninterruptedly performed, as we have already inferred. On the other hand, the analogy between the testes and the *mammæ* is by no means permissible. It would be equally legitimate to compare the testes with the pineal gland. The *mammæ*

subserve the performance of a function associated only with the parturient state ; the corresponding organs to the testes in the female, as every one ought to know, being the ovaries ; and corresponding physiologically, we naturally infer a functional correspondence, and this actually obtains. With or without sexual congress ova are discharged with the menstrual fluid every month. The absence of menstruation shows an abnormal state of the body ; its too frequent occurrence, or too copious a flow, likewise constitutes disease. Just as we would infer some abnormal condition, from the *entire* absence of involuntary emissions in continent healthy males, and disease from their too frequent or too copious discharge.

In the able papers which appeared in "The Lancet" (*vide* Appendix), the following argument against sexual congress, as recommended by some practitioners, is embodied:—"Seminal secretion is prompted by the presence of its proper stimulus, and the secretion prompts to the performance of the sexual act. The physiological remedy is the constant presence of the woman ; and her occasional presence only increases the evil it was designed to cure." It is implied in these propositions that the presence of the female is the stimulus to seminal secretion, and conversely that in the absence of the female there would be no seminal secretion, and consequently no sexual urgency. Now, we know that this in point of fact is not correct. It must be admitted that in unmarried as well as in married men—in the virtuous as well as in the profligate—secretion of semen proceeds in a normal ratio on the one hand, and preternaturally, just according to the degree of irritation psysical or physical by

which the testicles are influenced, on the other ; and again, that if the presence of semen prompts to the performance of the act it must do so alike in the married and unmarried, and that continence, as the term implies, cannot be maintained without an effort at the suppression of a normal function, which effort, in the opinion of men of acknowledged eminence, is apt to be attended with psychical as well as bodily disturbance, and *if overcome*, must be relieved by involuntary seminal emission.

Again, the able writer in "The Lancet," referring to marital excesses, remarks :—"The sexual intercourse which follows legitimately on marriage is not unfrequently pushed to excess ; but, even then, the evil works its own cure. In ordinary cases the physiological powers of the husband, and the nature of his employments in life, set from the first their appropriate limits to his indulgence. Nocturnal emissions cease at once (it consists with my knowledge that they occur even with married men) ; because they are superseded by the legitimate use of the sexual organs. Now, intercourse with prostitutes, regarded simply as occasional sexual intercourse, has no effect of the kind. A man who cannot marry, and who is worried by emissions, should endeavour to diminish secretion. By seeking women occasionally he only increases it, and feeds a craving which grows in proportion as it is fed. Physiology is completely on the same side as morality ; and the advice to seek irregular sexual intercourse as a remedy for emissions is altogether unsound in principle, and, if followed, would be unsuccessful in practice." Now, I confess my inability to admit the soundness of this able writer's argument.

Dissected, his physiology will be found to resolve itself into the performance or non-performance of a canonical rite. If in the married state it is alleged "nocturnal emissions cease at once, because they are superseded by the legitimate use of the sexual organs," how does it happen that illegitimate intercourse simply "feeds a craving which grows in proportion as it is fed?" Granted that intercourse with prostitutes is only occasional, and that "the physiological remedy is the constant presence of the woman," what does this amount to? It is admitted that marital excesses occur, "but the evil works its own cure. The physiological powers of the husband, and the nature of his employment in life, set from the first their appropriate limits to his indulgence." It follows that sexual congress can only be of occasional occurrence, compatible with health, and if occasional intercourse in the married state supersede nocturnal emissions, why not in the unmarried state? If the presence of the female stimulates the secretion of semen, and seminal plethora prompt the sexual act, how can the physiological remedy be the constant presence of the woman? Again, by a strange perversity of argument, the writer adds, "her occasional presence only increases the evil it was designed to cure." Would "physiology be completely on the side of morality" if her presence were constant, *without* the performance of the matrimonial rite?

Pathological or therapeutical considerations based on such reasoning as this, it need hardly be said, can carry no conviction.

But how *can* physiology be reconciled with the moral law? Turn we once more to what we believe to be

the normal condition of the vesiculæ and testes. It is their normal condition to be full. When full, and under the influence of neither mental nor bodily excitement, secretion of semen proceeds very slowly, but it is accelerated according to the degree of either variety of excitement. Augmented thus, seminal plethora occurs, and if the natural appetite which this state creates be not indulged, seminal emission must take place.

But how might the use, say, of the sexual organs supersede nocturnal emissions? * In the first place, by

* Sanctorius, dans ses observations, nous fournit une première cause de danger particulier. "Un coit modéré est utile, dit-il, quand il est sollicité par la nature ; quand il est sollicité par l'imagination, il affaiblit toutes les facultés de l'ame, et surtout la memoire. Il est aisé d'expliquer pourquoi. La nature dans l'état de santé, n'inspire des desirs que quand les vesicules séminales sont remplies d'une quantité de liqueur qui a acquis un degré d'épaississement qui en rend la résolution plus difficile, et cela dénote que son évacuation n'affaiblira pas le corps sensiblement. Mais telle est l'organisation des parties génitales, que leur action et les desirs qui la suivent sont mis en jeu, non-seulement par la présence d'une humeur séminale surabondante, mais que l'imagination a aussi beaucoup d'influence sur ces parties ; elle peut, en s'occupant des desirs, les mettre dans cet état qui les produit, et le desir conduit à l'acte, qui est d'autant plus pernicieux qu'il était moins nécessaire. Il en est de l'organe de ce besoin comme de ceux de tous les autres, qui ne sont mis en jeu à propos que quand ils le sont par la nature. La faim et la soif indiquent le besoin de prendre des aliments et de la boisson ; si l'on en prend plus que ces sensations n'en exigent, le surplus nuit au corps et l'affaiblit. Le besoin d'aller à la selle et d'uriner sont également marqués par de certaines conditions physiques, mais la mauvaise habitude peut si fort pervertir la constitution des organes, que la nécessité de ces évacuations cesse d'être dépendante de la quantité des matières à évacuer. On s'assujettit à des besoins sans besoin, et tel est le cas des masturbateurs. C'est l'imagination, l'habitude, et non pas la nature, qui les sollicitent. Ils soustraient à la nature ce qui lui est nécessaire, et ce dont par là même elle se gardait bien de se défaire. Enfin, en conséquence de cette loi de l'économie animale, que les humeurs se portent là où il y a une irritation, il se fait au bout d'un certain temps un afflux continué d'humeurs sur ces parties ; il arrive ce qu' Hippocrate avait déjà observé. Quand un homme exerce le coit, les veins séminales se dilatent, et attirent la semence."—*Tissot*.

removing seminal plethora, and, what is not of less consequence, by obviating psychical uneasiness from ungratified passion. If sexual congress in the married state prevent their occurrence, I must leave it to wiser men to explain the talismanic influence of a church rite?

Patients who are tormented with nocturnal emissions and cannot marry, are advised, forsooth, to diminish secretion.

“Go to the raging sea and say, be still!” A man finds himself so circumstanced that he cannot marry. Nature has formed him subject to the influence of certain organic functions over which he has no control. He is worried by an ungratified natural appetite, and he is considerably mocked by being told to perform what is nothing short of an absolute impossibility. As well tell a man with jaundice to diminish his biliary secretion, or the unfortunate victim of diabetes to arrest the diuresis which constitutes a notable feature of his disease.

But how CAN physiology be reconciled with morality? Go tell the platform orators, reform the tastes of the daughters of England, mortify their insatiable thirst for the worship of Mammon, give poor girls a fair day's wage for a fair day's work, remove those barriers to the state for which Nature made man, and then these ardent social reformers will be at least on the right road for the suppression of prostitution; and declaiming nastiness from platforms before mixed audiences will cease; if indeed these philanthropists will not argue (what they will perhaps, at least, thank me for suggesting) that the Almighty made the entire body, but consigned the dominion of the sexual organs to the Devil!

Among what class of the community is prostitution chiefly encouraged? Certainly not among the artizan class, with whom simple tastes prevail so largely, and where marriage is thus more frequently consummated, but among the higher grades of society where nature is lost sight of amid the gaudy tinsel of art.

Suppress prostitution! Turn the Mississippi! Pluck Jupiter from the studded vault of Heaven! The canker is in society. Prostitution is an appanage of an advanced civilisation. The attempt is Utopian and unphilosophical, while its causes are permitted to remain; and if possible, could not fail to be productive of greater evils.

The unfortunate victim of sexual disorders,—the prey of the charlatan,—the jeer and laughing stock of the *married* Puritan,—is further advised to mortify the flesh by violent exercise. Leave his desk, or other means of livelihood, to peregrinate by murmuring brooks, and devious tracks like La Mancha's knight in quest of adventures, to suppress a natural passion; now, the laughing stock of sensible people, and the consumed, possibly, of the pangs of a self-accusing conscience. Supposing it were effectual, where is the time to come from? But while it will ungrudgingly be conceded that gymnastic exercises are conducive to sound health, I most emphatically deny that seminal secretion can be diminished thereby. Who are the most prolific, the sons of toil, or the effeminate possessors of baronial halls? In this, my opinions harmonise more closely with the editorial articles of the "*Lancet*" above commented upon, where it is remarked, "we shall find, in the first place, that the power of physical exertion and of mental application,

in a degree sufficient to extinguish animalism, is not a common endowment soon after the age of puberty"—I should rather say not!

It is amusing to what extremes individuals will go, when a pet theory has to be bolstered up. Thus, Lallemand says, "The urgent necessity of recruiting each day, the great waste occasioned by varied progressive gymnastic exercise, diminishes in an equal proportion, the secretion of the semen; for the economy only occupies itself with the reproduction of the species when it has provided for the construction of the individual." This novel theory is assuredly more ingenious than correct. It is rather a good example of Lallemand's bad physiology, and the excellent development of his luxuriant fancy. That it is visionary, is clearly shown by the remarkable procreative capacity of patients far advanced in phthisis. Again, by an unfortunate forgetfulness, Lallemand states that "From the moment that the evolution of the generative organs commences, the testicles, if the texture is not accidentally destroyed, will continue to secrete up to a very advanced age."

It has certainly not been my object in the foregoing remarks to condone any infringements of the moral law. I have endeavoured to state the physiological issues, and let the reader judge further for himself. Of the propriety of restraining sexual *excesses*, at all periods of life, particularly during adolescence, there can be no difference of opinion.

Those cases in which psychical states occasion spermatic incontinence, by augmenting seminal secretion, present peculiar difficulties in treatment; and just as the cause so will the treatment resolve itself

into trains of thought calculated to divert the mind from the object of desire. Hence entertaining reading, exercise, and change of scene, should be enjoined.

“Venus otia amat. Qui finem quæris amoris,
Cedit amor rebus; res age, tutus eris.”

As a matter of course, religion has been assigned by some writers, a prominent place among the aids to continence. This trading upon religion, which unfortunately obtains to such an extent in these latter days, is in my opinion unmitigated cant of the most detestable description. Religion, a thing between man and his own conscience—the mental resting place between humanity and the eternal—should surely be held in a more sacred light by its professors, and the dignitaries of our churches, than that it should be flaunted like a red rag in a bull’s face, before soft-headed specimens of humanity, whenever the most prurient or selfish object has to be subserved.

General Considerations.—As accessory to the more direct medical treatment of spermatic incontinence, much benefit will be derived from cold bathing; when circumstances permit in the sea, and otherwise by means of sponge, or plunge and shower baths at home. The bowels should be kept free, by suitable diet if possible. For this purpose, the well-known Scotch dish, porridge and milk should form one of the meals. It may be taken a short time before the regular breakfast. Should this not have the desired effect, an occasional colocynth and hyoscyamus pill will be found to answer well. Particular instructions as to diet are totally uncalled for. Heavy suppers should be avoided. A moderate allowance of wine or malt liquor need not

be denied; while the golden mediocrity must be remembered.

Sine Cerere, et libero friget Venus,

which is quaintly translated in Culpepper's book, (1664),

Stuff not your guts with flesh and wine,
And lustful Venus soon will pine.

With this the maxim of Hippocrates *πόντοι, σιτία, ποτὰ, ὕπνος, ἀφροδίσια μετρία*—may be compared.

Early rising therefore should be observed by the patient.

In bringing this section of my task to a termination; looking back, my fervent hope is, that in endeavouring to shun Scylla, I have not fallen into Charybdis. Is it a disagreeable subject? Is it a human infirmity, or is it not? that is the question. Are venereal diseases disagreeable? Are fecundity, fertility, and sterility in the female, beneath the consideration of respectable physicians? If not, wherefore should the female have the exclusive benefit of the resources of our art? Is this affliction, real or imaginary, made the instrument of extensive robbery, and worse, of mental affliction, literally to millions? Has it been grossly exaggerated by certain legitimate practitioners? Does it people asylums? Is not our profession outraged, and the press befouled by vampires who feed on our culpable negligence or silence? Then *Tu, Critice, recubans sub tegmine pennæ*, vouchsafe unto me why it should not be exposed!

CHAPTER V.

STERILITY IN THE MALE.

To be possessed of offspring is an instinct deeply rooted in the human mind. It is unquestionably the consummation of the conjugal state, and in the absence of which domestic felicity is not unfrequently diversified by the occurrence of "family jars." That the instinct is an intense one, the amusing pilgrimages of demure matrons, to the oracles who hold court at the Circean temples of modern times unmistakably testify. Who can recount the hairbreadth escapes by sea and land of these ubiquitous devotees? Even medical history discloses how the far off Orcadia dismissed her barren *Pythiam Edinensis deliberatam*. Here arrived, the weather-beaten Hebridean Naiad jostled against the unfruitful Amaryllis of the more genial south; the voluble Columbian forgathered with her Celestial cousin, and——and, the stillness of "The Temple" was broken by the confusion of tongues commingling synchronously with the jingle of the golden offertory on the altar!

To me it seems not a little amusing that women, who at present manifest such alarming indications of not only holding their own, but of taking from the "unprotected male," not a little to which he has at least a prescriptive right, should, without protest, submit to the reproach of barrenness, as a matter of course

on their part. It may possibly be that their æsthetic sense of the beautiful, in babies, is of such an overpowering nature, that it actually did not occur to them that reproduction is a dual act. In all this, I do confess, that I consider the fair daughters of Eve (if they *are* really imposed upon) to be more sinned against than sinning.

Among the Persians, Herodotus informs us, a man was esteemed in proportion to the number of his offspring; and it appears to me that the *Lex Talionis* would decree if respect is due to the husband when the offspring is numerous, he should show cause why he should not be impeached where they are completely absent.

In all seriousness, I opine that there cannot be a doubt, that want of offspring has been too generally regarded as due to the female. This has led to uterine "speculations," incisions, replacements—in short, uterine tinkering of every description to an extent that is truly humiliating to contemplate—processes to which females have submitted with a meekness uncommon to them as a body, and consequently, *per se*, deserving of all commendation. How this may be explained, it is perhaps a little hard to guess, if it be not indeed, that, at least in Hyperborean climes, it is essential to the successful treatment of "inward complaints," that a man be either well-known for his advocacy of some medical heresy, such as homœopathy, or occupy the position of president, vice-president, or at least director of one or more given missions! The psychological bearings of these requirements I cannot explain—suffice it for me to state the fact.

Sterility in the male, contradistinguished from impo-

tence, to which brief reference will be made in the sequel, may be due, first, to congenital defects, and malposition of the generative organs, or one or other of them; and secondly, to the effects of disease.

Of the congenital defects, the most important are cases in which the testicles have not descended into the scrotum, cryptorchides (κρυπτός, hidden, and ὄρχις, a testicle), cases of one testicle (μόνος), cases of hypospadia ὑπό, and (σπαδόνισμα, a tearing), and cases of epispadia (ἐπί).

It is still a disputed point whether cryptorchides are absolutely sterile, and we shall briefly consider the evidence both *pro* and *con*. It was John Hunter's opinion, that when one or both testicles remained through life in the belly, they are exceedingly imperfect, and probably incapable of performing their natural functions. In this opinion, Hunter is confirmed by the observations of Mr Curling. It is assumed, as a matter of course, in these cases, that semen to be fertile, must contain zoosperms. Mr Curling, in a paper which he read before the Medico-Chirurgical Society of London, in 1863, gave details of two cases of double retained testicles in married men, without children, and other two cases of single retained testicle, the second testicle in one case being completely atrophied, while the other had been removed by operation. In the four cases there was perfect *virility*, though the ejaculated fluid was perfectly destitute of spermatozoa. To these cases, Mr Curling added three cases described by Godart, one by Peuch, and one by Mr Partridge, in all of which the fluid ejaculated was destitute of spermatozoa. The particulars of Mr Partridge's case are as follow :—A gentleman aged

thirty-four, had been married eight years to a healthy wife. He had strong sexual desire, and frequent intercourse, but no family. He died of tumour in the groin, which was found after death to have been due to encephaloid disease of a retained testis. The other testis, which was also retained, was of the natural size, but did not contain any spermatozoa. The disease having extended to the bladder, the condition of the vesiculæ was not determined. Mr Partridge was cognisant of another case of retained testes, where intercourse was frequent, but the fluid ejaculated was transparent, and did not contain spermatozoa. In this case, likewise, intercourse was frequent. A like occurrence was observed in another gentleman, aged thirty-four, who had frequent intercourse, and who consulted Mr Partridge as to the propriety of getting married. A microscopical examination of the fluid in this case also having revealed the absence of spermatozoa, an opinion adverse to his intentions was expressed, on the ground that there would be no offspring. At the meeting at which Mr Curling read his paper, Mr Webster expressed his opinion that sterility was *more frequent in males than in females*. In the horse it has been observed, in like manner, that if the testicles be retained in the abdomen, the animal, though capable of sexual intercourse, is sterile.

Non-descent of the testicles is of such rare occurrence, that Mr Marshall met with but one case of non-descent of one testicle in 1000 recruits, and non-descent of both once in 10,000. There are three preparations of this condition at Guy's; one of them taken from a gentleman, who, from despondency caused by his condition, shot himself.

From such cases as the foregoing, it has been inferred that crypsorchids are necessarily sterile, but other cases are also recorded which do not bear out this opinion. Two cases of fertile crypsorchids occurred in the practice of Mr Cock, late surgeon to Guy's. One of them had been twice married before the age of thirty, and had children by each wife, besides illegitimate children which had been affiliated upon him. Mr Poland relates in Guy's Hospital Reports, the case of a crypsorchid aged twenty-nine, in whom there was not the slightest trace of a scrotum. This man married at twenty; he had two children by his first wife, and at the date of admission into hospital was married a second time.

In 1862 a patient came under Mr Durham at Guy's, in whom the testicles were lodged in the inguinal canal. This man presented no signs of sterility; had two children by his wife, and since puberty (he was then thirty-two years of age) had been always sexually, perfectly competent. A similar case is described by Dr Debron of Orleans. This man had a son by his wife.

Casper is of opinion that crypsorchids are perfectly capable of procreation, and he cites a case related by Mahon, in which a most licentious criminal was discovered, on dissection, to be a crypsorchid. He further relates a case of a crypsorchid in which microscopical examination revealed the presence of spermatozoa. This was the case of a boy fourteen and a half years old, who had been guilty of unnatural conduct towards a boy eight years of age. Sixteen days after the criminal assault, Casper discovered the spermatozoa in stains on the boy's shirt. As this is a question on which the physician or surgeon is apt to be consulted at any

time, and one which may involve grave medico-legal considerations, it will be apparent that the opinion of Mr Curling could not be substantiated in a court of law, as it is absolutely negated by the cases just referred to. It certainly does not follow that in certain cases of cryptorchids sterility must exist; and the question of fecundity in suspicious cases can only be determined by microscopical examination of the fluid emitted *in coitu*.

Monorchids, it need scarcely be remarked, are not necessarily sterile. The condition termed hypospadia, in which the urethra opens by a slit on the under surface of the penis, in some situation between the glans and the perineum, is, in its aggravated forms, an extremely rare condition. Epispadia, the corresponding condition on the upper surface, is still more rare. The aperture may be situated near or at a distance from the glans, and may consist of a mere slit, or involve part, or all the urethra. When the latter condition exists, it is usually complicated with eversion of the bladder, and approaches the condition of hermaphroditism. With respect to the procreative power of hypospadias and epispadias, it will be obvious that much will depend on the degree to which a departure from the normal condition exists. If the aperture be situated near the glans, this condition is of no consequence; nay, impregnation seems possible when hypospadia exists to a very extreme degree; and Schenck and Simeon describe cases of hereditary hypospadia. Hypospadia and epispadia can be regarded as causes of sterility only in cases where the orifice of the urethra is so situated that the seminal fluid cannot be projected into the vaginal canal. In fact, animals may be

artificially impregnated. Valentin thus observes—
“Coitus is not a necessary condition for impregnation. It is merely an expedient selected by nature for bringing together the two different kinds of germs in many animals. . . . The rigidity of the organ is not a necessary condition for the ejaculation of semen, or for impregnation. It only materially favours the act of copulation. . . . since the seminal stream may describe a tolerably large arc, it may force its way into the vagina, though only the point of the glans be introduced between the lips of the vulva, or, if these be separated, in any other manner. And the spontaneous movements of the spermatozoa make it possible for them subsequently to reach the cavity of the uterus through its os.”

Among the other congenital malformations, there may be complete absence of the vasa deferentia; but this is so rare an occurrence as simply to merit being mentioned. There is yet another singular malformation on whose occurrence Rokitansky throws doubt. I refer to the occurrence of two penes placed side by side.* Of this malformation there is no doubt. (For an account of a remarkable case of this kind *vide* “Lancet,” July 29th, 1865.) The genital functions were perfect.

STERILITY FROM DISEASED CONDITIONS OF THE REPRODUCTIVE ORGANS.—But semen may be naturally formed, and sterility be occasioned by obstruction to its communication with the vesiculæ and urethra. Thus, in cases of gonorrhœal epididymitis the vas deferens may become occluded. And if double, sterility inevitably ensues, while this condition lasts,

* Schenck (Observ. lib. iv. 2, 8) relates the case of a double penis.

though in such cases fluid may be discharged from the prostate and vesiculæ *in coitu*. Semen may be perfectly formed in such cases, but it remains imprisoned. As the result of interesting experiments on dogs, M. Gosselin found that, after ligature of the vas deferens, spermatic secretion persisted for sixteen months; and that the obliteration of the epididymis is capable of being removed. This result, of course, cannot be predicated in all cases.

M. Gosselin has collected seventy cases of this nature. In fifteen, the epididymitis dated from a few weeks to a few months, and in all of them the induration was permanent. There was no modification of the genital functions in any respect whatever, save the absence of spermatozoa. In two cases the spermatozoa reappeared—in the one at the end of eight months, after a second epididymitis, the first occurring six years previously; in the other after six months time, likewise after the appearance of a second epididymitis, the first occurring eleven months before. Of these fifteen cases, thirteen were lost sight of. Of the remaining five, of the twenty, they were cases of double epididymitis. The disease in one had been contracted twenty years before; the induration persisted in the one side but was absent in the other, and the fluid ejaculated therefore contained spermatozoa. In the remaining four the induration persisted, and the spermatic filaments were consequently absent.

In his edition of Curling's work, Gosselin adds five more cases. In two the spermatozoa reappeared after the absence of many months. In a third, where the patient was under observation for three months, the semen contained no spermatozoa. The two remaining

were cases of bilateral epididymitis contracted in early youth, and spermatic filaments were absent in the ejaculated fluid. Patients were married for several years, but had no issue. Godart has observed the removal of the induration of the epididymis in cases in which, however, fecundation was not restored. This induration, he asserts, may be seated in the loose cellular tissue surrounding the epididymis, and the commencement of the vas deferens, or it may exist between the coats of the canal itself; rarely ever in its interior. Godart believes that the deposition of the phosphate of lime in the convolutions of the epididymis may, by obliterating the vas deferens at its origin, give rise to spermatocele, the same as if caused by plastic exudation from an inflammatory state of the parts. It is therefore concluded, that while the induration consequent on double epididymitis may be removed, and full procreative powers be restored, in certain other cases the arrest of the function prevents the reappearance of the spermatozoa.

According to M. Liegeois, a more favourable prognosis may be formed, with respect to the return of spermatozoa, in non-blenorrhagic than in the epididymitis following gonorrhoea. Of eighty cases of epididymitis, spermatozoa reappeared as follows :—

| | | | | |
|-----------|----|--------|---|------------------------|
| Gosselin, | 25 | cases, | 5 | returns of spermatozoa |
| Godart, | 35 | „ | 1 | „ „ |
| Liegeois, | 23 | „ | 2 | „ „ |

It is interesting to notice that, contrary to what obtains in the case of other double organs of the body, an affection of one testicle is apt to react upon the other, and instead of the energy of the sound one being

redoubled, the very reverse occurs ; even atrophy may ensue.

THE TREATMENT of induration of the epididymis will consist in the inunction of mercurial preparations into the part, and the internal administration of bichloride of mercury with large doses of the iodide of potassium ; of which certainly not less than ten grains should be administered thrice daily. Godart, by the aid of purgatives and iodide of potassium, has succeeded in removing these indurations after the lapse of ten years. The most chronic case may, therefore, be taken in hand with the prospect of success.

STERILITY FROM STRICTURE comes properly under this section, and not under impotency where it is usually placed. This constitutes the *misemissio refluens* of Mason Good, and is a more frequent cause of male sterility than usually supposed. A stricture which offers little or no impediment to the passage of urine, may, in the erect condition of the penis, where the calibre of the canal becomes so much diminished, offer such resistance to the discharge of semen, that it is forced back into the bladder, and becomes mixed with the urine. Deidier relates a case of a somewhat similar nature, in which a fistulous communication existed between the vesiculæ seminales and the rectum. In consequence of this condition, during intercourse, no semen was emitted from the penis, but nearly all passed into the bowel.

The cure of sterility from stricture, will necessarily be that of stricture itself ; and of the last condition, if ever found to exist, the usual treatment of fistula.

TUBERCULAR AFFECTIONS OF THE TESTICLES.—The

testicle, in common with so many other glandular structures of the body, is liable to tubercular deposit, occurring more frequently in the epididymis. From this, it is apt to extend backwards to the accessory organs, the vasa deferentia, the vesiculæ, and the prostate. With respect to the bearing of orchitic tubercular deposits on fecundation, different opinions are entertained. Godart is of opinion, that an individual with even one tubercular testicle is barren. In this view, he is supported by Gosselin. Mantegazza likewise details the case of an individual suffering from tubercular softening of the epididymis of one side, in whom no spermatozoa were found in the opposite testicle, though perfectly free from disease. In opposition to the conclusions, borne out by these observers, M. Liegeois narrates the following case. A man twenty-eight years old came to me, he remarks, with a fistulous opening in the left scrotum. The probe introduced here, leads to the indurated and deformed epididymis. The affection dates back five or six years. This man, of apparent good constitution, presents none of the signs of pulmonary consumption. His virile faculties have notably diminished since the development of the tumour. His semen, 1·50 gramme, contains from five to ten spermatozoa, under each preparation. This observation proves that the presence of tubercles in one testicle does not abolish the spermatie secretion of the opposite side, but it also shows, that when this secretion persists, it only does so in relatively small limits.

Even one case invalidates an absolute rule; and while it may more frequently obtain that tubercular deposit in one testicle abrogates the function of the

other, it cannot positively be asserted that sterility inevitably follows.

INFLUENCE OF DISEASE ON FECUNDATION.—Godart has found spermatic filaments in the vesicles of patients dead from pneumonia, Bright's disease, gangrene of the lungs, typhoid fever, and peritonitis. Often in cases of individuals who had been ill from pneumonia, variola, pleurisy, and scarlatina, and examined by him, no change whatever was found in the spermatic secretion. It is inferred the azoospermia, in consequence of acute disease, if occurring in early life, is only temporary, while it is otherwise in advanced life.

With respect to the influence of chronic diseases on the seminal secretion, very diverse views are likewise entertained. With regard to phthisis pulmonalis, I have myself seen numerous cases, which have impressed me with the conviction, that in these cases fecundation is not impaired; nay, I should say the very reverse.

Godart thinks that in cases of phthisis, occurring at an age corresponding to the establishment of the spermatic secretion, spermatozoa are absent; while he admits that after puberty they are not. He believes, further, with respect to tubercular orchitis, that sterility precedes the development of the local lesion by a year or two.

CANCER, AND OTHER MORBID GROWTHS, may occur in the testicle, but with these diseases, in the present instance, we are not particularly concerned.

There is yet another circumstance, which in perfectly healthy individuals unquestionably causes azoospermia and consequent sterility, viz., excessive coitus.* Cases are recorded in which seminal fluid has been examined

* *Vide* page 178.

after a close succession of sexual indulgences, in which the spermatozoa were diminished in proportion to the demands made upon the testicle. It would appear, therefore, that spermatozoa are not secreted as such—at least in the form by which we recognise them—but require a certain time for maturation. This may certainly be a cause of sterility; and hence, Mason Good remarks that “abstinence by consent, for many months, has, however, proved a more frequent remedy than any other, and especially when the intercourse has been so incessantly repeated as to break down the staminal (*sic*) strength; and hence the separation produced by a voyage to India has often proved successful.”*

It is from this cause that the *Dysspermatismus Serosus* of Sauvages occurs. His definition of it is “Ejaculatio seminis aquosioris, adeoque ad genesim inepti, quæ species est frequentissimum sterilitatis virilis principium.”

* The happy results which sometimes followed the Edinburgh pilgrimages are thus easily explained.

CHAPTER VI.

MALE IMPOTENCY.

An unqualified recognition of the convenience of calling a spade a spade, and of the propriety of so doing, is one of the treats likely to be reserved for more enlightened, if not more liberal periods of sublunary existence.

I have my suspicion, however, that prudery and vice are old associates—but this is possibly a vulgar opinion, and no more of it!

So long as people (genteel people) will persist in calling a spade an agricultural implement of particular size and form; so long as periphrasis is looked upon as an indication of good breeding, is it not highly becoming that impotency in male or female should be presented to medical literature in a Greek dress? A celebrated metropolitan obstetrician has accordingly undergone the throes of a philological parturition, and has brought forth—not a mouse, but dyspareunia—an offspring on the production of which he is much more to be congratulated. The learned inform us that Sophocles used the word in this sense, “το δυσπάρευνον λεκτρον ἐνδευτομενος.” Whether Sophocles or his contemporaries begot children after the manner of the moderns (and the word λεκτρον may throw some doubt upon a question, the solution of which might obtain the fellowship of a learned society) does not

consist with my knowledge, but it is certain that what we vulgarly call impotency, the Greeks recognised, and that apparently, being the subject of it, was not at all calculated to foster, or perpetuate conjugal felicity. As the writer is not a candidate for the fellowship of a Gynæcological Society, he must dismiss the archæological view of the question, until such time as his ambition assumes a different and *more* exalted phase.

Impotency in the male may be classified as follows : modifying the classification of Mason Good.

| | |
|---|---|
| Entonic impotency, . . . | { Imperfect emission proceeding from super-erection or priapism, &c. |
| Impotency from diminished reflex paresis, . . . | { Retarded emission from some abnormal condition of the nervous system. |
| Epileptic mesemission, . . | { Seminal emission perverted by the occurrence of epileptic seizures. |
| Idiopathic azoospermia, . | { Absence of spermatozoa from unknown causes. |

ENTONIC IMPOTENCY.—Of entonic impotency from super-erection, I am not cognisant of an example. Dr Mason Good cites a case in point, recorded by Dr Cockburn. The patient was a Venetian of noble family, who though married to a fine and healthy young lady, had no seminal emission in the act of sexual congress, notwithstanding that there was vigorous erection, and involuntary seminal discharge during sleep. He was greatly afflicted, as were also his family, by such a misfortune ; and failing beneficial treatment at home, the Venetian ambassadors at the different courts of Europe were requested to consult the most eminent physicians in their respective quarters. Under these circumstances, Dr Cockburn was consulted, and divining the condition to be due to excessive plethora of the vessels

of the penis, and consequent coarctation of the urethra during coitus, which possibly caused a seminal reflux into the bladder, a condition he surmised not occurring during sleep, he recommended lowering treatment, purgative medicine, slender diet, &c., which were soon followed by the desired issue.

Mason Good relates a case of a somewhat similar nature, which came under his own notice. A young healthy couple were married for seven or eight years without offspring, at the end of which time, the lady became pregnant, and added every year to her family until she had six or seven children. In a professional conversation with Dr Good, the father made it appear that the temporary sterility was due to the cause under consideration. Cases of this nature are of every-day occurrence.

That priapism, by which is to be understood persistent erection due to disease, prevents seminal emission, is known by the fact that in these painful cases, masturbation has been actually resorted to for the removal of the distressing malady, and in vain.

ANTICIPATING MESEMISSION.—This is perhaps the most frequent cause of male impotency. I am unwilling that I should lay myself open to the charge of ignoring opinions contrary to any I have adduced, or will adduce, coming from any one whose views command respect. It is but right, therefore, that I should assert that, in a vigorous literary onslaught against a Mr Dawson of London, Dr King Chambers contends that, "over-emission, when attempting connection, arises in sensitive persons from allowing the mind to dwell too much upon it." I may here remark that I yield to no one in my sympathy with the honourable motives by

which Dr Chambers was so palpably actuated throughout this controversy. Dawson's book, Acton's book, Milton's book, *et hoc genus omne*,* contain much, in my opinion, that is overdrawn, irrelevant, and consequently pernicious; but one is apt in the impetuosity of a righteous crusade against any form of iniquity to overlook stray facts. For myself, I must say, that I have frequently been consulted with reference to cases of this nature, and I am bound to observe, that if this is a manifestation exclusively of a purely mental state, it is a very inveterate one if allowed to work its own cure; and that I believe that I have remedied this condition by internal remedies, and I flattered myself that I discovered in certain cases, a cause for it, in prostatic hyperæsthesia. *In media tutissimus ibis*—so I believe there is a proportion of these cases in highly sensitive men, where mental emotion alone must be looked upon as the disturbing element, and that these cases get well without interference.

Dr Chambers, I am sure, will be charitable enough to admit, that because he may not have seen such cases, it is neither just nor permissible to throw a direct denial in the face of writers of unimpeachable respectability. I have actually never seen an ulcer of the uterus, that invaluable stronghold of the "Phalloid school." I know highly accomplished men who have been over thirty years engaged in general practice, who have never been able to diagnose a flexion, or version of the uterus, anterior, posterior, or lateral. But it does not follow that these conditions do not

* There is one honourable exception, which, in justice to the author, I am bound to mention. Making allowance for legitimate differences of opinion on minor points, the little book of Mr Courtenay on this subject is unobjectionable.

exist, though much doubt must be thrown on the pathological importance assigned to them. I trust I may yet see these departures from the uterine elliptic, and be convinced of their importance. To show how susceptible we are of intellectual development, why, *vaginismus* has actually been discovered, of late, within a hundred miles of the classic shrine of Saint Mungo! Who would have been fool-hardy enough to have predicted this half-a-century ago?

Dr Tanner refers to the following case of *misemissio anticipans*. "A young man about twenty-five years of age, has never had sexual intercourse, but he confesses to having practised masturbation since he was thirteen or fourteen years of age. His penis is normal, both testicles are of a proper size, they feel healthy and they are situated in the scrotum.

"He enters into a matrimonial engagement; but unfortunately a period of eighteen months or two years must elapse before he can fulfil his contract. During this interval he sees his future wife daily, and in spite of his resolve not to encourage any feeling of excitement, yet repeatedly he suffers from seminal emissions. At the time of marriage he is nervous, weak, and has fits of mental depression, while his wedding trip is rendered perfectly miserable on finding that immediately he attempts to have connection, an emission takes place, and the erection ceases. Night after night his efforts prove unavailing; until at the end of two or three weeks he becomes thoroughly ashamed of himself, afraid of his wife's female relations, and terribly depressed."*

* Ce symptôme est très-fréquent parmi les personnes qui se sont épuisées, et il contribue à entretenir l'épuisement; la plus petite tentation produit un commencement d'érection, qui est suivie d'un écoulement.—*Tissot*.

Is this the production of a luxuriant imagination? Where this accusation begins, in the case of an honourable man, argument ends. If this is a typical case, as I believe of many that have come under my own notice, and I am sure the experience of not a few will furnish similar cases, is it a normal state? I trow not.

It is a condition which might justify divorce, and to remedy which, it is as much the province of the physician or surgeon, as to extract a cataract or amputate a thigh.

The TREATMENT of this condition will be that of chronic prostatic hyperæsthesia as already referred to.

IMPOTENCY FROM DIMINISHED REFLEX PARESIS.—Impotency from this cause is unquestionably a rare occurrence. I have known one case of diminished reflex paresis, occasioning preternatural postponement of seminal emission. It existed in the case of a patient suffering from *morbis coxæ*, which doubtless in some manner affected the pelvic portion of the nervous system. B. Schulz relates a case, in which a man of twenty-eight years of age could not ejaculate till coitus had been continued for an hour and a half! And also a case of aspermatism in a man of twenty-seven, who had never been able to ejaculate during coitus, although he had perfect erections. Seminal emissions occurred during sleep in both cases.* The treatment of such cases must be based on such exigencies as each seems to present.

Impotency from diminished reflex paresis, and the anticipating variety, or, as it has been figuratively termed by Ploucquet, *ejaculatio intempestiva*, to a certain extent involve the theory of copulative incongruity and

* Vide page 286.

epigenesis. Whether it is essential to impregnation, that the sexual orgasm in both male and female should be contemporaneous, is a question on which I cannot express an opinion.

EPILEPTIC MISEMISSION, occurs when in persons predisposed to epilepsy, or of a very sensitive nervous organisation, a fit is occasioned by sexual congress. It is said of several eminent men that epilepsy was thus induced. Its treatment will essentially be that of epilepsy.*

IDIOPATHIC AZOOSPERMIA.—There are cases in which, independent entirely of structural or other disease, there is an unaccountable absence of spermatozoa in the ejaculated fluid. In the work of Hirtz of Strasburg, published in 1861, entitled “De la Sterilitie chez l’homme,” there are narrated the cases of two robust men, several years married, childless, and presenting no abnormality of the genital organs. Coition was in these cases performed not only normally, but with unusual vigour; yet, in both cases there was a complete absence of spermatozoa. Hirtz observes, “A remarkable thing, and upon which both have insisted, is, that the ejaculations *are never followed by the sense of fatigue so generally experienced in the physiological state.*”

* Sauvages, in his “Nosologia Methodica, seu classes morborum,” (p. 230,) relates the case of an individual who was for twelve years attacked, in the act of copulation, with a spasm which extended throughout his whole body, with loss of feeling and consciousness:—“Ita ut illum præ oneris impotentia, in alteram lecti partem excutere cogeretur uxor, et evacuatio spermatis lenta flaccidoquè veretro demum succedebat, remittente corporis rigiditate.” Tissot states that he knew many analogous cases; and Haller, in his observations on Boerhaave’s Institutes, refers to several such cases. *Vide* also Didier, Quest. Medic. an Epilepsis Mercurius vitæ; Galen, De locis affectis. l. v. c. vi.; Henri van Heers, Observationes Medicæ oppido raræ, Obs. 8; Boerhaave, De Morb. Nerv., p. 462.

Notwithstanding the most nourishing dietary, and the administration of the oil of phosphor, neither one nor other had children. M. Mantegazza, professor of General Pathology in Pavia, referring to the absence of spermatozoa in the uriniferous tubes inspected after death, states, that in 100 subjects of different ages, he finds spermatozoa absent nine times in one testicle, and twenty times in both. The absence is, in some of his cases, explained by material lesions, such as tubercles of the epididymis and testes, and fatty and fibrous inflammation of the epithelium of the seminal ducts, and these cases, of course, cannot be regarded as cases of idiopathic azoospermia; but in certain cases Mantegazza was unable to discover any physical alteration, and he arrives at the conclusion, that "in certain obscure cases of sterility during marriage, the fault may be in the man, even though the development of his genital organs should cause us to look to his wife for the cause of infecundity."

MALE PRECOCITY.

Even as history affords so many notable examples of mental precocity, so does medical literature furnish examples of unfortunate occurrences of genital precocity, and these may be briefly referred to as well from their interest in a physiological point of view, as for the purpose of reprobating the public exhibition of such unfortunate children.

The earliest notice of a case of this kind with which I am familiar, is that referred to by Pliny (Nat. Hist. lib. vii. c. 17). This was the case of a boy at Salamis, four feet in height, who had reached puberty when only three years old. Craterus, brother of Antigonus,

both generals in the army of Alexander, and the former a man of considerable literary fame, mentions having seen a *man* who, in seven years was an infant, a father, and an old man, and a corpse.

In 1748, Mr Dawkes, a surgeon of St Ives, near Huntingdon, published a small tract entitled, "*Prodigium Willinghamense; or, an account of a surprising boy, who was buried at Willingham, near Cambridge,*" on whom he wrote the following epitaph:—"Stop, traveller, and wondering know, here buried lie the remains of Thomas, son of Thomas and Margaret Hall; who not one year old, had the signs of manhood; not three was almost four feet high; endued with an uncommon strength, a just proportion of parts, and a stupendous voice; before six he died, as it were of an advanced age. He was born in this village, October 31st, 1741, and in the same departed this life, September 3rd, 1747." Other cases of a similar nature may be found described in the "*Journal Des Savans* for 1688," and the "*Philosophical Transactions* for 1745."

TREATMENT.—The treatment of such unfortunate cases as the above, will resolve itself into moral as well as medical. The public exhibition of such children cannot be too strongly reprehended, for, as Dr Good remarks, "The orgasm is fed by a repetition of examinations, and the polluting tide that exhausts and debases the body, is at length accompanied, even though it should not be so at first, with a polluting pleasure, that in a still greater degree exhausts and debases the mind." An occasional application of leeches to the affected part is recommended, cold bathing, aperients, and light and unirritating garments. It is alleged that, by these

measures, a healthful repression is produced, and that the unhappy infant is thus enabled "to grow up with gradual vigour to the possession of a healthy manhood, instead of sinking, as has been sometimes the case, into a premature and tabid old age at the early period of puberty."

CHAPTER VII.

ANOMALOUS URETHRAL DISCHARGES.

So extravagant are, and to so great an extent have the statements of Lallemand, and the mischievous productions of his too willing disciples, engaged professional as well as non-professional attention, that on the discovering by a patient of a urethral discharge, the cause of which he cannot explain, he is forthwith placed in the unenviable position of making himself supremely miserable. That such should be the case, to him who is familiar with the French literature of the subject of functional urinary diseases, and the pernicious emanations of the native press, will be a matter of not the least surprise.

It is essential, therefore, in obedience to the plan of the foregoing pages, that we glance, at least, at other urethral discharges hitherto less fully considered.

Under the term, *Anomalous Urethral Discharges*, we include such discharges as are not venereal, and those not seminal, consequently, cases of simple urethritis, or phallorrhœa; discharges due to prostatic affections, prostatorrhœa, and the discharge which occasionally accompanies cases of acute orchitis. From what has already been advanced, it will be manifest that it is impossible to arrive at any conclusion regarding the secretion of Cowper's glands, and that a preternatural discharge from the vesiculæ

seminales, independent of the fecundating portion of their contents, is an absolute impossibility. It follows, accordingly, that the diseased condition termed vesicular gleet has, properly speaking, no existence, save in luxuriant fancy.

The recognition of simple urethritis is a matter which, not unfrequently, involves important social and moral questions; and it cannot be too strongly urged that a purulent discharge from the urethra, totally unconnected with venereal infection, is by no means of rare occurrence. Nay, further, just as in the female, it is impossible in the present state of our knowledge to distinguish between leucorrhœa and gonorrhœa, except by such surmises, confessedly inexact, as general considerations afford, so in the male, it is equally impossible to discriminate between a case of simple urethritis and one of gonorrhœa with any greater degree of well-founded assurance. To such an extent, indeed, is this difficulty recognised, that it is contended by certain modern authorities, that gonorrhœa is capable of being communicated by females who are themselves perfectly free from the disease. This, if admitted, would practically amount to the conclusion, that there is no such a disease as specific gonorrhœa,—an alternative to which we cannot assent, even admitting as we do the extreme difficulties of diagnosis. The relation of the two affections is not more remarkable than that which subsists between the suppuration of pyæmia and that of a healthy surface; yet no one will contend that there does not exist some specific distinction unrecognisable by any means of which we are at present cognisant. As already mentioned, cases of simple urethritis originate from sexual

intercourse during the catamenial period in the female, from intercourse with those affected with leucorrhœa, or when, in other cases, an acrid condition of the secretion of the uterus and vagina exists, without absolutely the slightest evidence of disease. Again, it is undoubted that simple urethritis is occasionally due to inordinate indulgence in alcoholic liquors, whereby depraved assimilation and perverted conditions of the urine are established.

Diday* alleges that cases of simple urethritis from such causes are characterised by their obstinate persistence under the usual treatment of gonorrhœa, and, I am disposed to think, from such cases as have come under my own notice, that the statement is correct. The following case may be cited in illustration. J. R., a healthy young man, then residing in the country, consulted me on the 15th April 1871. On the 1st January, he had indulged freely in intoxicating drink, and had connection with a female servant in the house in which he resided. On the previous Friday he had also connection. On Wednesday the 4th January, he complained of a burning heat in making water. For this symptom, no discharge having yet appeared, he consulted a druggist on the following day. Internal medicine alone had been prescribed. Patient believes the medicine to have been *copaiba*. No discharge taking place, the medicine was discontinued; but within a week from its discontinuance a copious purulent discharge from the urethra occurred. Patient, in consequence of the supervention of this new symptom, put himself again under the treatment of his former adviser. On this occasion the same internal medicine

* Arch. Gen. de Med., October 1861.

was given, in conjunction, however, with an injection, the latter of which patient believed to have been too strong, as it made him worse. *After contracting the affection* of the urethra, patient had frequent intercourse with his paramour. He accused her of labouring under venereal disease, which she stoutly denied. He is confident that she suffered from no discharge or disease either then or afterwards. The female was aware that he suffered from some disorder of the genitals, but the fact that *she enjoyed an immunity from the affection* confirmed her in the belief of his statement, that what he suffered from was simply a "weakness of the glands." The discharge continued for about five months, despite the most painstaking treatment.

* In the foregoing pages we have seen that the fluid which is sometimes discharged at stool, particularly when the bowels are costive, is usually the secretion of the prostate. In other cases, where the sexual organs have been subjected to preternatural excitation, a discharge from the prostate, more or less continuous, takes place, constituting the affection designated prostatorrhœa. This discharge is distinguished from seminal fluid by the absence of spermatozoa, by its being thinner in consistence, more transparent, and more or less gummy or tenacious in quality. Symptoms referrible to the neck of the bladder, and urinary incontinence, are usually associated with it. The following are typical cases of the affection under considerations :—

A. R. consulted me December 12th, 1871. I had formerly successfully treated patient for spermorrhagia. A short time prior to this period he called upon me

with reference to a purulent discharge from the urethra, which, as he had married six months previously, and had led a life of perfect chastity, I had no difficulty in pronouncing to be non-specific urethritis. This affection yielded to ordinary means within a reasonable time; but while the purulent discharge had disappeared, a considerable quantity of slimy matter was voided immediately after micturition and at stool, and nocturnal emissions of semen were of frequent occurrence. Of late patient has had no sexual desires, he is troubled with restlessness, partly owing, no doubt, to mental causes, and he is obliged to rise frequently during the night to empty the bladder. Patient was put under the treatment already described. *December 12th.*—The nocturnal emissions and the slimy discharge have disappeared, but there is still pain when seminal emission takes place, along with deep seated pain in the perineum, more or less constant. A short time afterwards these symptoms entirely disappeared.*

* As we have already seen (*vide* page 181 *et passim*), it cannot be absolutely maintained that seminal fluid may not sometimes be discharged, in conjunction with the secretion of the prostate, in this manner. Hence Tissot remarks, "Un autre accident auquel cette quatrième cause (masturbation) rend les masturbateurs plus sujets, c'est une espèce de paralysie des organes de la génération, d'où naissent l'impuissance, par le défaut d'érection, et la gonorrhée simple, parce que les parties relâchées laissent échapper la véritable semence, à mesure qu'elle arrive, et suinter continuellement l'humeur que séparent les prostates; et qu'enfin toute la membrane intérieure de l'urètre acquiert une disposition catarrheuse, qui la dispose à fournir un écoulement de même nature que celle des pertes blanches des femmes: disposition, pour le dire en passant, moins rare qu'on ne pense," &c.

Boerhaave's opinion on this point is to the following effect:—"On lit, dans quelques livres de médecine, que la semence s'est quelquefois écoulée sans qu'on l'ait sentie. Mais cette maladie doit être très-rare; et je ne sache pas que la semence se soit écoulée sans quelque chatouillement, ou ce n'était pas de la vraie semence séparée dans les testicules, et accumulée dans les vésicules séminales, quoique j'aie vu la liqueur des prostates sécouler." Tissot holds a

G. G., aged 29, married, has suffered for years, to use his own language, "from seminal weakness." Patient is not incapacitated for sexual congress, but during the time there is a constant discharge from the urethra, followed afterwards by headache and general pains throughout the body. The act of copulation is of normal duration as a rule; when otherwise it is abnormally protracted, *and sometimes no discharge whatever ensues*. Patient is not troubled with nocturnal emissions. Before marriage genital excitement was accompanied, as it now is, with a copious secretion from the urethra, and pain "in the lower part of the stomach and testicles, which almost doubled me up." This state has lasted for eight years. Patient is at present under treatment.

Acute epididymitis is likewise occasionally attended with a sympathetic discharge from the urethra, resembling a case of genuine blennorrhagia. It is not a little remarkable, that in cases of acute gonorrhœa, when orchitis supervenes, the discharge from the different opinion, and the one which, as we have already seen, the facts adduced lead us to support. He remarks, "Cette autorité est sans doute bien respectable, mais, outre que Boerhaave ne décide point positivement, il a contre lui tous les médecins; et, pour ne point sortir de son école, l'un de ses plus illustres disciples, Gaubius, admet l'évacuation de semence sans sensation. Mes propres observations ne me laissent pas douter de l'existence de l'une et de l'autre maladie. J'ai vu des hommes qui, après une gonorrhée virulente, après des excès vénériens ou des masturbations, avaient un écoulement continu par le verge, mais qui ne les rendaient pas incapables d'érection et d'éjaculation; ils se plaignaient même qu'une seule éjaculation les affaiblissait plus qu'un écoulement de quelques semaines; preuve évidente que la liqueur de ces deux évacuations n'était pas la même. . . . J'en ai vu d'autres qui avaient, comme les premiers, un écoulement qui les affaiblissait beaucoup plus, qui les rendait incapables de tout prurit vénérien, de toute érection, et par là même de toute éjaculation, quoique les testicules ne parussent point hors d'état de faire leurs fonctions. Il me paraît démontré que, dans ces derniers, la vraie semence testiculaire s'écoulait sans sensation."

urethra is generally suspended, and that the converse should take place when orchitis is the primary affection, the discharge in the latter case abating as the inflammatory symptoms are moderated. I have more frequently seen this discharge in cases of orchitis occurring within a moderate time after the cure of gonorrhœa. It need hardly be remarked, that the appropriate treatment of this variety of urethral discharge is essentially that of orchitis itself.

In concluding these observations, I will not affect to suppress the hope that, to some extent, however little, they may have a beneficial influence; that my failures may direct abler attention to obscure points—my successes, if any, afford encouragement to their study. As there is nothing more base than medical imposition, of which verily we have too much, so there is nothing more ennobling than unselfish endeavours to assuage human suffering of whatever description. In giving my views of disease, my judgment has been influenced as far as possible by personal experience; and in the treatment of hypothetical or debateable points, I have written, if I know myself, under the restraint and guidance of a sacred regard for the true, a holy detestation of the meretricious, and a lively appreciation of the truths,—that he who has no convictions must either have misspent his time and opportunities, or be a fool—he who obstinately refuses to form any, a bigot—and he who can and has formed convictions, but who is afraid to give them expression, the most contemptible creature of the three, *a coward*, and consequently the perpetrator of a fraud upon society.

Heu mihi! tot mortes homini, quot membra, malisque
Tot sumus infecti, Mors ut Medicina putetur.

APPENDIX.

Dr Black's Letter to "The Lancet," referred to in Preface, and editorial comments thereon—

QUACK ADVERTISEMENTS.

TO THE EDITOR OF "THE LANCET."

SIR,—I have read with entire concurrence, as I am sure must have been very generally done, your remarks on the above subject in your impression of June 18th. I am persuaded that the extent to which functional diseases of the generative system worries young men is not fully appreciated by the profession; and if venereal diseases have been rescued from the quacks, I agree with you in seeing no reason why the same could not be accomplished in the case of spermatorrhœa, real or imaginary. You will correct me if I am wrong in assuming, that of the number of young men who address you regarding bodily disease, nine-tenths do so for spermatorrhœa. Nor can surprise be felt, while such lukewarmness exists among the profession with respect to this subject, while the most unscrupulous of the provincial papers open their columns to the filthy advertisements referred to by your correspondent, that so many young men get entangled in the skilfully wrought meshes of the charlatan. Either spermatorrhœa is or is not a disease. If a disease, it cannot be beyond the pale of legitimate practice any more than gonorrhœa or syphilis; if not, the delusion cannot be too soon exploded. While I believe that the importance of the subject has been much exaggerated, there is no doubt in my mind as to the injurious effects of an excessive seminal drain and its attendant complications. Believing, then,

that there is such a disease as spermatorrhœa, and one as amenable to treatment as, or perhaps more so than, functional disorders of other organs, I hold with you that the happiness of youth and the interests of society demand from the profession a less reserved acknowledgment of it. An incalculable amount of good might result, I think, if lecturers on medicine or surgery would devote but *one* lecture of their course to this subject—one on which the future practitioner is so certain to be consulted in the course of his practice. The same may be said of the occasional appearance of a judicious article on the subject in your journal. I have been a faithful reader of "The Lancet" for eight years at least, and during that time I have not seen a paper on this subject in its pages. Let it be openly avowed that no disease is beneath the solicitude of the legitimate practitioner—let us not fail "to satisfy the expectations of the public," and then quackery will inevitably die, and imposition become extinct. This subject is one of vital importance, and the suggestion of "A Countryman" is a good one. The influence of a respected medical man in a family circle is great, and it cannot be used to a better purpose than to the exclusion of newspapers which prostitute a powerful influence to co-operation with charlatanism. Provincial newspapers are clearly the greatest offenders against public morality in this respect. By excluding such advertisements, these and all other papers will deserve well of the public; and their influence, instead of being diminished, will be augmented in the eyes of all intelligent people.—Yours, &c.

D. C. B.

June, 1870.

From "The Lancet," June 16th, 1870.

We last week published a letter signed with the initials "D. C. B.," in which arguments were adduced to show the advantages which would result from careful study of the functional disorders of the male generative system. We need not say how entirely we agree with our correspondent, whose remarks, indeed, were in the main suggested by our own. It is quite true that a certain amount of quackery is altogether inde-

pendent of the profession, and that the demand for it, so to speak, arises solely from the inability of legitimate medicine to accomplish impossibilities, or to fulfil unreasonable desires. The *bon-vivant*, who wishes at once to indulge his propensities and to preserve his digestion, flies to a quack, because the physician truly tells him that the two aims are incompatible with each other. But such demands as these would never support quackery as a trade ; and its success is due to the skill of its followers in finding out those dark corners of pathology which medicine and surgery have not sufficiently explored, and concerning which legitimate practitioners are prone to give widely different opinions and advice, or even to avoid giving any opinions at all. Of such corners there are few now remaining ; and the domain of systematic quackery is almost narrowed to cases of real or fancied sexual incapacity.

It would, perhaps, be hardly just to say that such cases are not understood by the profession, because in most text-books on surgery there will be found some slight reference to them, in which sound principles are correctly stated. But it would be perfectly just to say that, even in books, such cases are slurred over with extreme brevity ; that the details essential to successful medical treatment are seldom clearly laid down ; that the patients receive, as a rule, very little sympathy or consideration ; and that they are not assisted to overcome the difficulties that hinder them from seeking advice.

Now, we think this is a very unfortunate state of things. Partly from actual instinct, and partly from a custom that has prevailed long enough to become a secondary instinct, there is a repugnance, on the part of the young, to speak about sexual matters ; and this repugnance places a formidable obstacle in the way of patients who have to seek advice from a man probably much older than themselves, possibly their superior in social station, and to whom they are personally known. The difficulty is increased if the patient feels that he will have to plead guilty to masturbation—a practice which he has learned to regard as at once a physical and a moral transgression, but which he is not on that account the more disposed to relinquish. And, if after over-

coming his unwillingness to speak, he finds himself curtly received, told that there is nothing the matter with him, and that all he has to do is to abandon self-abuse, the chances are very many that he will fall into the hands of the quack after all. The remedy for all this would be, that the profession should learn to treat functional sexual disorders, as they treat all others, simply and entirely as matters of business, without the smallest reference to any consideration but the cure of the patient. To this end, in such disorders, there are many important surgical and physiological details that require close investigation, and that differentiate the conditions which will come under the notice of the practitioner. Inquiry into those details will be the only safe guide to a rational therapeutics, and will at the same time win the confidence of the patient, and assure him that the nature of his malady is understood. In our existing surgical literature we know of no work in which these details are treated, by any sufficient authority, with adequate care and fulness, and without digression into questions which, however important, are wholly irrelevant in a medical point of view. We think that some of our great surgeons, already placed absolutely above the suspicion or the need of writing for practice, and able to raise to his own level any question that it pleased him to touch, might render a most important service to the community by publishing a book, or delivering a course of lectures, that should lift the mere surgery of spermatorrhoea and sexual debility out of the mire into which it has been cast by ignorance, by shamefacedness, and by greed. The subject might in this way be made to take its place in the ordinary domain of practice, and to be no more embarrassing to either doctor or patient than illness of any other kind. And we cannot help thinking that it would be a step towards this desirable consummation, if practitioners would make it a custom, when consulted by boys or young men, to ask one or two plain questions about the state of the sexual functions, just as, in the case of young women, they now invariably ask about the catamenia. If the latter had for generations been a tabooed subject, we should not be in possession of our present knowledge about the diseases peculiar to the weaker sex; but the fact that every doctor

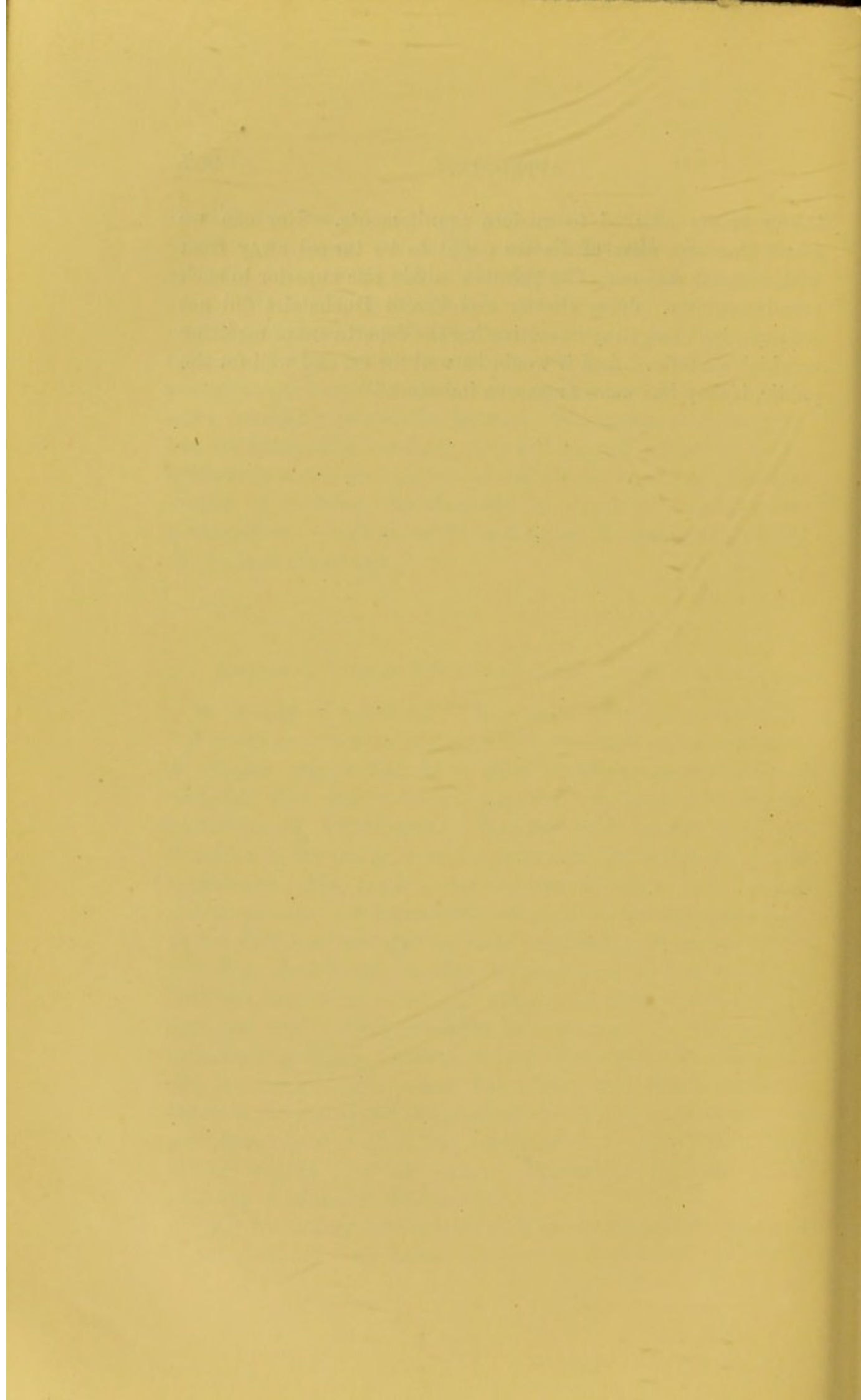
assumes the propriety and necessity of inquiring about menstruation, places him at once in the position of a man whose aid and counsel are to be sought in the case of any menstrual derangement. He ought to occupy the same position with regard to real or presumed sexual weakness in the male, and there can be little doubt that, in many instances, the inquiries we have suggested would be quite as much *ad rem* as many of those that are more commonly put at the bedside. We conjecture a good deal, but we know with certainty very little, about either the actual prevalence or the direct effect of self-abuse; and everything that tended to clear up the obscurity in which this and kindred questions are involved, would be a source of great, and probably of unmixed advantage.

From a Leading Article in "The Lancet," July 10, 1857.

In treating of quackery, "The Lancet" observes as follows:—
"We only see one available remedy in the hands of the profession. A prudish reserve has, in a great measure, deterred men of character from undertaking a specialty connected with the depredations of adventurers. Whether such reserve has been beneficial to the public or to the profession, grave doubts may be entertained. We think a different course might have been a public service. Let honourable and scientific men take possession of the field now occupied by those vagabonds. It cannot matter to a high minded surgeon what department of surgery he adopts. Sufferers must exist, and ought to have the advantage of consulting men who have a character to preserve. To relieve such sufferers is as high a vocation as any other connected with medicine or surgery. We cannot but admire that such a confusion between the *moral* and the *physical* should ever have swayed the profession, as that it is less reputable to conserve the genito-urinary organs than any other. Specialities are the natural offspring of advanced civilisation.

"All the stilted declamation that can be thundered against us to the contrary, will never persuade us that a subdivision of

labour is not adapted to modern requirements. Nor can we admit that any class of disease ought to be turned away from with affected disgust. The greatest minds rise superior to such pseudo-gentility. John Hunter and Parent Duchatelet did not see anything derogatory in cultivating the department of medicine to which we refer. And it would be well for us, and well for the public, if they had more numerous imitators."



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