The irritable bladder : its causes and curative treatment / by Frederick James Gant.

PATHOLOGY & SOCIAL SCIENCE.

THE

IRRITABLE BLADDER:

Its Causes and Curative Treatment.

BY

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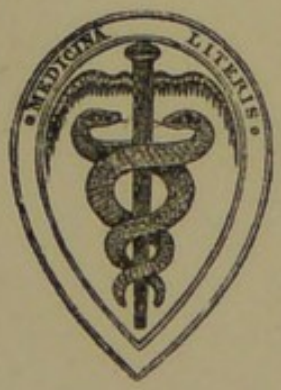

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TO

THE PRESIDENT, THE VICE-PRESIDENTS,

AND

COMMITTEE OF MANAGEMENT

OF

THE ROYAL FREE HOSPITAL,

AT WHICH, AS ONE OF THE SURGEONS,

HE HAS SHARED THE EXPERIENCE OF EXTENSIVE SURGICAL PRACTICE,

THIS MONOGRAPH

Is most respectfully Dedicated,

BY THE AUTHOR,

FREDERICK JAMES GANT.

PREFACE.

The application of certain departments of natural science to the immediate wants of society seems to me to have been much overlooked. Guided by this omission in respect to Pathology, I have endeavoured in the following pages so to apply its resources as to suggest the reform of certain social habits, by illustrating their evil results in various constitutional conditions of disease, and their frequent issue in one very painful local affection—Irritability of the Bladder.

I have recorded chiefly the results of my own observations and reflections, and in seeking to convince, I have expressed myself as I would speak, in such language as I deemed would be most appropriate to the occasion;

but in so far as I have presented faithful, although familiar interpretations of Nature, I trust to come home to the wants and sufferings of the many who are concerned: and I have concluded with some practical remarks on the Curative Treatment of the Irritable Bladder.

FREDERICK JAMES GANT.

GRENVILLE STREET, BRUNSWICK SQUARE,
January, 1859.

ERRATUM.

Page 39, last line but one, *for* Lord Ogilvy's *read* Lord Ogleby's.

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INTRODUCTION.

THE CONSTITUTIONAL CAUSES OF LOCAL DISEASE.

THE great end or object of medicine is the cure of disease.

To accomplish this object it is necessary to acquire a preliminary knowledge of many branches of natural science; but the *medical* importance of each department of such knowledge should be estimated by its more or less direct applicability to the art of curing disease. Anatomy may invite by its matchless demonstrations of constructive skill and perfect mechanism—by the endless gradations of structure which animated nature presents, and by the sublime laws of comparative anatomy. —"Can these dry bones live?" Yes; and

physiology may captivate by the history of living beings—by the history of ourselves before birth, through infancy, childhood, adolescence, decrepitude, and death. The beauties of botany and the marvels of chemistry may each engage our attention; and pathology—the science most akin to therapeutics—may claim our special study; but, we are not anatomists, or physiologists, or botanists, or chemists; no, nor pathologists *alone;* we are, or should be, somewhat of all these professions, and something more—we seek to remove disease, and to prevent its recurrence; we are physicians and surgeons, or general practitioners, as the case may be.

When we remember how botany, for instance, is overtaught in schools of medicine, one would really imagine that the enthusiastic professor was addressing an audience of youthful horticulturists, or perchance an agricultural meeting, rather than those whose future lives would be devoted to

the bed-side study of disease, and to its revelations after death. Surely a due consideration of the special functions of our profession would do much to re-arrange the curriculum of medical education, would place each subsidiary department of knowledge in its proper place, and would direct teachers how far each should develop his own course of instruction to students in medicine—to those whose special duty it will be hereafter to remove, or at least relieve, disease, and prevent its recurrence.

But the art of curing disease obviously implies its previous detection and knowledge of its distinctive characters, or the art of diagnosis, which must therefore be regarded as the root of practical medicine and surgery. It has been said of the practice of medicine without this perceptive power, that nature is fighting with the disease—a blind man armed with a club (that is, the physician) comes to settle the difference. He first tries to make

peace—failing to accomplish that, he lifts his club, and strikes at random: if he strike the disease, he kills the disease; if he strike nature, he kills nature.

Guided by these reflections, I lately instituted an original inquiry* respecting the applicability of pathological anatomy *during life*—to diagnosis and to therapeutics. I endeavoured to demonstrate the application of pathological anatomy to these purposes, by proving that its resources are the surest guide by which we may most early detect and exactly distinguish diseases during life; and, further, by establishing certain rational principles for their curative treatment; and I concluded by proving that the twofold condition of disease and life combined can *alone* be our guide during our performance of surgical operations.

* "What has Pathological Anatomy done for Medicine and Surgery, including Operations?" See the *Lancet*, ten Serial Papers, September, October, and November, 1857.

Having thus applied pathological anatomy, a few words will now suffice to elucidate the value of its resources compared with those of pathology, as methods of detecting and distinguishing diseases, or methods of diagnosis.

I need scarcely observe that pathology includes two forms of disease—alterations of structure and alterations of function; both forms of deviation being estimated by comparison with a presumed standard of health. Alterations of structure (and whatever physical properties and chemical constitution may be associated therewith) are together represented by the science of pathological anatomy, while pathology is thus restricted to mere alterations of function. Such then is the general nature of pathology, and such its more limited and usual signification.

The two forms of disease to which I have alluded are frequently associated, if not inseparably combined. But diseases of structure precede their functional manifestations. It may

be that the earliest alterations of structure are minute, and therefore likely to escape detection; it may be that such alterations refer only to the vascular condition of the tissue or organ affected, and that its vestiges are almost or altogether effaced before a *post mortem* examination ensues (should the disease prove fatal), and thus many nervous diseases may appear purely functional; but instances of functional disturbance *alone* are very doubtful, and are gradually being reclaimed to altered structure. Thus its presence is *more essential* than functional derangement, and the appliances of pathology in relation to diagnosis relapse into those of pathological anatomy. Functional deviations from the standard of health have no significance apart from their accompanying alterations of structure; and common experience reminds us of many instances of sudden death, after which chronic organic lesions have been discovered, the existence of which had never been even suspected during life.

Moreover, alterations of structure are *more constant*, and therefore supply a more certain and exact method of diagnosis. No fixed and invariable relation subsists between function and structure. The *same* modifications of function may accompany very *different* conditions of structure—palpitation of the heart, for instance, being associated with either simple atrophy of that organ, or with the still more fatal lesion of its degeneration into fat; and conversely, the *same* alterations of structure may produce *variable* alterations of function, for the fatty heart may yield no warning palpitation,—may throw out no functional symptom,—previous to its final stroke in sudden and unexpected death. Thus, the mere functional symptoms of disease are as the Will o' the Wisp, now present, now receding, and ever eluding our grasp; while the signals thrown out, so to speak, from the interior, by alterations of structure (with their accompanying physical and chemical characters) prove, when percep-

tible and recognised *during life*, sure and faithful guides; to you who doubt, they will conclude your judgment and inspire confidence, they will give you composure and a steady hand; they will make you happy, for they will make you safe.

We may, therefore, conclude that the resources of pathological anatomy applied during life afford the more early and exact method of detecting and distinguishing diseases. In what way, then, can our knowledge of their pathology conduce to their rational curative treatment? We answer, by enabling us to detect during life the *internal* causes of disease by virtue of their functional operation. The mode by which such causes operate may be explained by reference to that great law of *balance* between the functions of parts composing the animal economy, whereby all are mutually associated. If thus the blood's circulation be selected as our starting point and as the link adjacent to nutrition, then we may

regard respiration, digestion, and excretion as accessory functions, and as having collectively a direct relation to those of the nervous system. These again are in their turn dependent on the former for their support. No link in the chain of this circle can be broken by the pathological excess, deficiency, or perversion of any one function without disturbing the harmony of all the rest, and although such perturbations must in their turn be referred to certain alterations of healthy structure (and therefore to pathological anatomy), yet structural alterations can only *operate* as internal causes by virtue of the functional disturbances which they occasion. Pathology, therefore, suggests the rational curative treatment of disease, by pointing out the functional operation of its internal causes.

The healthy co-operation of digestion, circulation, and other functions, may be appropriately termed their *constitutional* relation. This relation in respect to physiology did not

escape the notice of one of the deepest thinkers of any age. "For," said he, "the body is not one member, but many. If the whole body were an eye, where were the hearing? If the whole were hearing, where were the smelling? And if they were all one member, where were the body? But now are they many members, yet but one body; and the eye cannot say unto the hand, I have no need of thee; nor again, the head to the feet, I have no need of you."* Or again, to extend this relation to the pathology of *internal* organs. Does the stomach refuse food—the *whole* body wastes. Does the liver withhold the bile—the *whole* body becomes jaundiced. Do the kidneys refuse to excrete—the *whole* body becomes dropsical. Does the brain fail to electrify—the *whole* body is paralysed. Do the lungs cease to play, or does the heart fail to beat, "is that pitcher broken at the fountain, or that wheel stopped

* First Epistle to the Corinthians, by St. Paul.

at the cistern?" Then does the body drop to earth, and the spirit rejoin the God who gave it.

A due knowledge of functional relations, and of the disturbances of those relations—Pathology—will therefore aid the resources of Pathological Anatomy in detecting *during life* the constitutional causes of local disease. Thus a mere local functional disturbance may prove to be a symptom of disease *in operation* at perchance a remote distance in the body, and which being itself far removed from the scene of its local manifestation, would not appear to be the cause of such topical disturbance. Irritability of the urinary bladder for instance, arising from some morbid condition of the urine, may prove to be the *local* warning to an individual which first directs his attention to that condition, itself due to a far more grave disease of the kidneys, the stomach, or nervous system. Hence the value of many symptoms, which, although themselves comparatively insignificant, may nevertheless

guide us to discover latent disease in some distant and hitherto unsuspected organ.

If we seek to interpret the operation of constitutional causes, we may perhaps refer them to the agency of the blood circulating throughout the body, and to the universal distribution of nervous influence, from the central nervous system, to every part. These two agencies are perhaps together the bond of union or sympathy between distant parts, and explain the intimate relation which subsists between their diseased conditions. But whatever theory, or interpretation of facts, we may admit, certain it is that the pathological relation of distant parts, —the operation of internal or constitutional causes—and its direct applicability to the detection of those causes, and therefore to the rational cure of disease, cannot be disputed. Irritability of the urinary bladder has been cited in illustration of this position. By the expression, vesical irritability, I would denote a more or less painful desire to frequently re-

lieve the urinary bladder of its contents. This disturbance of the function of that organ is at once a symptom of many diseases affecting distant parts, and the common effect of many causes, constitutional as well as local.

I would here briefly notice the anatomical condition of the bladder, to which its irritability may be immediately ascribed. The urinary bladder may be regarded as a hollow expansion of mucous membrane continuous with that of the ureters and urethra; the function of this membraneous bag being simply to receive and retain the urine until convenience may permit of its discharge. The external aspect of this receptacle is closely surrounded with bands of muscular fibres—the unstriped variety—disposed amid cellular tissue, either vertically or horizontally. These muscular bands are plentifully supplied with blood-vessels—the superior and inferior vesical arteries—with also some branches of the uterine arteries in the female—these together being

divisions of the internal iliac, and which inosculate and issue in large plexuses of veins. These are seen chiefly at the neck, sides, and base of the bladder, and terminating in the internal iliac veins, are accompanied in their course by lymphatics. Nerves are moreover supplied partly from the sacral plexus, itself derived from the spinal cord, and these nerves are also distributed on the base and neck of the bladder; but a large supply coming from the hypogastric plexus of the great sympathetic is distributed on the upper surface and remaining portion of the bladder not supplied by the sacral plexus of nerves. These muscular bands, blood-vessels, lymphatics, nerves, and cellular-tissue, together form a second layer or coat, superimposed on the "mucous coat" in which the vessels and nerves ramify and terminate; while externally the "muscular coat" is partially invested by a reflexion of the peritoneum, "peritoneal coat."

The healthy irritability or contractility of the bladder is the vital property of its mus-

cular bands. These contract from time to time, both vertically and transversely, and thus by their joint action expel, as occasion may require, the contents of the bladder. The pathological condition of undue irritability is to be immediately referred to the muscular or middle coat of the bladder, while the painful desire to evacuate its contents, which is so frequently associated therewith, is due to one or other system of nerves, or to both.

This brief anatomical sketch of the bladder elucidates the direct action of certain local causes of undue irritability. Should the capacity of the bladder peculiar to an individual be diminished from any cause, while the quantity of urine poured into it is undiminished, or, perchance, increased, then a more frequent discharge of urine, or the phenomena of undue irritability, will ensue. The influence of pressure in the neighbourhood of the bladder, whether from constipation, tumour of the rectum, pregnancy, dis-

placements or tumours of the uterus, abscess adjacent to the bladder, and the action of other local causes, may perhaps be thus explained.

Again, hypertrophy of the muscular coat will so diminish the capacity of the bladder as to occasion more frequent micturition. Hypertrophy may be produced by any chronic obstruction to the free discharge of urine. Chronic enlargement of the prostate, or stricture of the urethra will so obstruct the flow of urine, and thereby overwork the propelling power of the muscular coat as to occasion the hypertrophy or overgrowth of its bands of fibres. The capacity of the bladder is diminished in a corresponding measure, and thus again arises the necessity for more frequent micturition.

Organic diseases, as cancer, affecting the bladder itself may perhaps in like manner occasion undue irritability of that organ; but acute inflammation, cystitis, being unattended

by any notable thickening of the bladder, cannot occasion excessive irritability, through any mechanical influence on the evacuation of its contents.

Lastly, there are frequent instances of vesical irritability in which no structural alteration whatever of the bladder can be detected either during life, or after death, but which are associated with certain morbid conditions of the urine. This secretion is the natural stimulus to contraction of the bladder, and the retention of more or less urine after micturition, in certain cases of stricture and enlarged prostate, but which are not combined with hypertrophy of the bladder, may explain the coexistence of irritability under such circumstances. The healthy stimulating property of urine may readily be supposed to vary with its chemical composition, and the changes which in this respect it more frequently undergoes, are an excess of either lithates or phosphates, announced by the pre-

sence of red or white sand respectively in the urine. These deposits are due either to some organic disease of the kidneys, or to disturbance of their healthy excretive function, through the influence of certain constitutional conditions, the exact nature and operation of which have hitherto escaped detection. Thus, the blood may abound in lithic acid, first discovered by Dr. Garrod in the blood of gouty persons. This gouty condition of the blood is induced by mal-assimilation of azotized food, aided perhaps by some derangement of the digestive process, and the crisis of these constitutional disturbances may be the escape of lithic acid in the urine, accompanied by a painful desire to frequently relieve the bladder. This vesical irritability is believed to be occasioned by the direct contact of urine with the bladder, and such is also supposed to be the *modus operandi* of those constitutional conditions which are associated with phosphates or other morbid states of the urine.

The following pages will, I trust, tend to elucidate the constitutional and local causes of "the irritable bladder." I need scarcely advocate the direct relation of such an inquiry to the rational prevention and curative treatment of this painful local affection. The removal of a cause necessarily anticipates the recurrence of its effect, and, therefore, by removing the causes in question, their local manifestation will subside. But the true etiology of disease cannot be defined by merely constitutional or local conditions. The evil lies deeper. Thus the indigestion which perhaps precedes the presence of lithic acid in the urine, may itself be preceded by certain *errors* of diet. This antecedent in the pathological history of irritable bladder carries us beyond its constitutional origin to its primary origin in the infringement of certain conditions which are essential to the preservation of health. These and other hygienic requirements are frequently violated by the habits of society, and it is to

this aspect of general etiology, as exemplified by irritability of the urinary bladder, that I would now take occasion to invite special attention.

THE SOCIAL ORIGIN OF CONSTITUTIONAL DISEASE.

He who succeeds in tracing back an apparently local disease to its constitutional origin in the blood, or other vital structure, contributes to the principles of rational medicine; but he who succeeds in referring the origin of such constitutional condition itself to the habits of society, contributes not merely to the philosophy of medicine, and to the cure of disease, but also indirectly, to the preservation of public health.

The habits of society variously influence the hygienic requirements of regimen,—ventilation,—temperature, and clothing,—exercise, daily occupation,—sleep, and the estate of mar-

riage. Our social habits, in these respects, however various, are all concerned in either preserving health or producing disease, and one leading feature in our study of disease should be our search after all those *special* circumstances (including, therefore, habits of society), by which this or that disease is produced, or its character modified, and by the due consideration of which our remedial treatment should be guided. In this respect, the experienced practitioner surpasses the mere student of systematic works—too often caricatures rather than portraits of nature; and viewed in this light, therefore, an inquiry respecting the habits of society as causes of disease, is a legitimate contribution to the principles and practice of medicine. Or again, by thus regarding etiology, the resources of pathology may be applied to reform our social habits—to thereby anticipate their evil results, and aid the preservation of public health. The more prevalent the disease thus investi-

gated, the more valuable will be our contribution to the public good.

It appears to me that this relation of pathology has hitherto been overlooked. Unhappily, however, he who takes this higher view of etiology, and, moreover, seeks thus to apply the resources of pathology, is open to misrepresentation. It may be hazardous for such an one to pass beyond the usual confines of medical works, and enter the threshold of social life, without apparently compromising the professional character. Yet I do sincerely believe, that the more we regard the constitutional origin of disease as but the reflection of certain social habits, and the more we seek thereby to portray the lights and shadows of their local manifestations (and this in language most descriptive), the more shall we advance the rational treatment of disease; and, moreover, by coming home to the actual wants of society, the more will the profession of medicine be appreciated and honoured. This view

of etiology is that language which everybody will learn, nor disdain to have its alphabet perpetually in their hands. This is that pathology which addresses itself at once to the wants and understandings of mankind: the drama of disease, as personified by the actual conditions of society, whether past or present—for the history of nations is but a chapter in the physiology and pathology of man.

So much then for the *general* nature of that influence which proceeds from our social habits regarded as causes of disease. But of the many excellent works which practical men have hitherto issued, the greater number have been derived from hospital experience of the *poor*, perchance, the destitute sick.* Of these records of medicine, many are invaluable class

* See "De extantiori Frequentiâ et Deterioratione Morborum inter Vulgus." 1788, Toggenburger. "Diseases of Artisans," by C. F. Otto, G. C. Holland, Patissier, Coschwitz, Buniva, Rammazini, Thackrah, and Tralles.

monographs. On the other hand, few such works are interwoven with those social peculiarities which, being incident to the *affluent*, should modify the treatment of diseases, which, if not peculiar in themselves, yet arise under peculiar circumstances, and which modify their character.* There is, perhaps, no disease quite peculiar to any one class of society, but certain varieties and complexions of disease are respectively induced by habits of poverty, and by those which are incident to ease and affluence.

The habits in question refer either to the regulation of the mind or body; but they may alike issue in one and the same result. The body and mind are indeed such inseparable

* See "An Essay on the Disorders of People of Fashion," by Tissot, M.D., F.R.S. Translated from the French by Francis Bacon Lee. "Observations on the Influence of Habits and Manners, National and Domestic, upon the Health and Organization of the Human Race, and particularly on the Effect of that Influence as it relates to the present state of English Females in the Higher and Middle Classes of Life." 1822. By Ralph Palin, M.D.

companions that, as Sterne truly remarks, like a coat and its lining, if you rumple the one you rumple the other.

The first attack on the fortress of health, and the first breach in its bulwarks, come perhaps more generally from without. The body is encompassed by many *external* causes of disease; and of all those which are affected by the habits of society, perhaps the most frequent and eventually fatal, are errors of regimen. Our social habits in this respect are the fruitful parents of many evil results both to mind and body. First and foremost among their immediate effects are the varieties of indigestion, which may in their turn give rise to certain morbid conditions of the constitution; for example, corpulency and its results, frequently to a gouty tendency with red sand in the urine and irritability of the bladder. Or again, our social habits may induce an opposite state of the general health, but associated with the same vesical irritability. The

enfeebling influence of an in-door life, or of only carriage exercise so called, coupled with the want of some daily mental occupation, some object in life, or this, perhaps, supplied by the excitement of "the season," succeeded by ennui and exhaustion, all tend to paralyse the nervous system, and to induce a deposit of white sand in the urine with, perhaps, irritability rather than tone of the bladder, in common with atony of the whole muscular system. Under similar circumstances perhaps, diabetes of various kinds may ensue, with a profuse secretion of morbid urine containing sugar, or an excess of urea, and accompanied by the same incessant and intolerable desire to relieve the bladder. Lastly, not to mention either the habitual neglect of ablution, or the restraints of society in relation to vesical irritability, we may notice the mismanagement of pregnancy as a frequent cause of that condition; but this glance will be resumed in the sequel; meanwhile, on thus briefly

reviewing the various aspects of social life more peculiar to the affluent, we may trace their influence, individually and collectively, in producing one and the same result—this, through the operation of certain constitutional conditions, and more especially those of the digestive process, or of the nervous system. Irritability of the bladder is, in fine, one result of many pathological causes, constitutional as well as local. It matters therefore but little from what point of view we commence our survey of social life; but as certain features more prominently invite our attention, I would enter further into detail respecting them.

PART I.

CONSTITUTIONAL CAUSES OF IRRITABILITY OF THE BLADDER.

ERRORS OF DIET AND MAL-ASSIMILATION OF FOOD.

We should remember the uses of food; these are, firstly, to supply a material which, when dissolved by the process of digestion, may be absorbed into the blood, and thence repair the waste of the body incurred by exercise; and secondly, to supply a material of such nature, that on being absorbed, shall directly sustain the temperature of the body, by combining with the oxygen of the air introduced by respiration; this calorific process being further aided by combustion of the waste matter referred to. It is obvious, therefore, that wholesome food must not only be digestible (capable of solution), but must also consist of matter the *chemical composition*

of which is adapted to repair the various tissues of the body, and to support the animal heat. Such then are the alimentary requirements of all animals, man included; but occasionally the body requires a higher temperature, and therefore demands an additional supply of combustible matter in the shape of fat, starch, sugar, or other carbonaceous substances. This material, if not consumed by the respiratory process, is stored up as fat in the body.

Wholesome food must, therefore, be a due admixture of certain ingredients, and each *natural* variety of food presents a due commixture of these ingredients. These are chiefly albumen, fibrin, gelatine, fatty matters, certain salts, of which common salt is most abundant, and water. I might here notice the proportion of these materials in each article of ordinary diet, in bread, various kinds of meat, vegetables, and so forth; but for such details I would refer to original authorities. It is sufficient for our present purpose to know that

the *most* nutritious diet implies (a due supply of food itself being) a wholesome combination of certain essential ingredients. The nutritive quality of food being thus defined by the proportion (no less than the nature) of its constituents, it is obvious that the wholesome proportion of fat to muscle for example, cannot be disturbed, without also, and in a corresponding measure, impairing the nutritive value of meat.

I have pursued this question in a work lately published,* and although it may be objected, that I selected for examination certain prize cattle not specially intended for human food, but only as samples of those breeds which most readily fatten (*i.e.*, at the earliest age), still it should be remembered that the animals which I selected were samples of the ENGLISH SYSTEM of feeding, the great *principle* of which has ever been to discover what breeds will most speedily yield (irrespective of the

* See A New Inquiry by the Author, "Evil Results of Overfeeding Cattle." 1858. Churchill, London.

nutritive quality of the meat) the largest amount of anything—say fat—in the shortest period of time; and this in order that the capital invested may be returned with interest as soon as possible, and reapplied. The nutritive quality of meat produced is disregarded. The interests of the public are not apparently identical with those of cattle breeders and feeders, and by the pathological results of over-feeding *prize* cattle, the *principle* of the system now so generally pursued throughout England is at once convicted and proved to be erroneous. The over-fattening propensity of this or that prize-endorsed breed may not stop short of disease, while the mere production of fat is certainly not a criterion of the nutritive value of human food.

We may somewhat anticipate the evil results of an injudicious diet. Its primary effects are manifested by the stomach itself, with the surface of which the food first remains in contact. Hence the varieties of indigestion—

the irritable, the inflammatory, and the atonic varieties of dyspepsia, the symptoms of which are due to the muscular fibres, the nerves, and blood-vessels of the stomach. Thus may we recognise the Irritable Dyspepsia associated with pain after food; nausea, or actual sickness and acidity; the Inflammatory variety, known by the same local symptoms, coupled, however, with general febrile disturbance; while Atonic Dyspepsia is distinguished by abdominal distension and flatus, lethargy, and general debility. We may not always succeed in tracing this or that form of dyspepsia to this or that error of diet; but we may, perhaps, venture to associate the Atonic variety with excess of vegetable food, while Irritable and Inflammatory Dyspepsia (followed by a gouty tendency, red sand in the urine and irritability of the bladder) are connected with an undue proportion of the more stimulating varieties of *animal* food. Nor are the artificial resources of the *cuisine* wanting to

aid the stimulating influence of a meat diet. Time, indeed, would fail to enumerate all the mysteries of the culinary art. Their daily results are familiar in our mouths as household words, and their consequences may be seen in the consulting-room of every physician and surgeon. Not that I would censure the *judicious* use of certain condiments, no less salutary than palatable; for I well remember the restorative resources of Mons. Soyer on the bleak hill-side of Balaklava, and on the burning shores of the Bosphorus. Such resources are not errors, but excellences of diet. The great object of cookery is to render food palatable as well as digestible (soluble). The former requirement is indeed preparatory to the latter; for the chemical agency of the saliva is now fully admitted, although not fully understood, and the flow of saliva during a repast is very much regulated by the savoury or insipid character of the food. But daily observation convinces me that in this respect and every

other, the whole process and purpose of digestion is still misunderstood or disregarded by the public at large. The stomach still inflicts its pains and penalties, and with all our sanitary pretensions, there is not a more prolific cause of disease in daily operation than errors of diet.

The food requirements of every individual are regulated by age, sex, and temperament, and by other circumstances of distinction.

In early life, when the body is growing, the demand for food is proportionably greater than at maturity, or than in advanced life, when nutrition fails and the body dwindles, or perchance accumulates fat, instead of the growth and development of its muscles and vital organs; but while these are forming, the *quality*, no less than the quantity of the food, should be specially adapted to the kind of tissues which are then growing *most* rapidly. The chemical components of the nervous system—of the bones and muscles—should respectively be found in the food. How faith-

fully are the alimentary requirements of young animals supplied by milk, the first and best provision of bountiful nature for her offspring! It is not during this period of life that irritability of the bladder arises from an over-azotized and stimulating diet.

The *regular* supply of food is also very important—not to disappoint the periodic demand of the stomach, and to meet the perpetual waste of the system. To this end the appetite, if not vitiated by excess, is a sure and faithful guide. The digestion and assimilation of food is not in the ratio of the amount taken into the stomach, but in proportion to the wants of the system; and any surplus food, if not speedily evacuated, is absorbed, accumulates, and encumbers. The high pressure circulation of blood which ensues, may break down at any moment, and eventually must yield. Over-eating and drinking are indeed drafts on the constitution, although payable perhaps some years after date.

But the modifying influence of other individual conditions should not be overlooked in our estimate of diet. In *females*, the process of nutrition is perhaps comparatively more speedy than in those of the male sex, and during pregnancy certainly, the growth of the fœtus demands an additional supply of food over and above the ordinary requirements of the system. The nourishment during so many months of the forthcoming offspring is equivalent to the loss of so much blood by the mother, and this loss should therefore be replenished by a more generous diet during the whole period of pregnancy. It is well known that the neglect of this precaution favours the occurrence of anæmic convulsions after parturition; and it is no less certain that puerperal mania may ensue as the result of exhaustion from over-suckling. I would only add, that in such cases it must be obvious, that all reducing measures will only increase the general ex-

citement; and although the happy and triumphant hopefulness of approaching mania might seem to forbid all stimulants, yet that the excitement (seldom fatal) will subside under the free administration of wine and of a nutritious diet.

The food-requirements of both age and sex vary also with the *individual temperament* or constitution. Temperament implies an excess or deficiency of some one function, or of certain functions, in relation to others. Thus, the sanguine or red-blood-making constitution with its tendency to surfeit, can be maintained in high health on less animal food than the phlegmatic, languid, pale, lymphatic person, from whom a large portion of the food passes away undigested or unassimilated. Again, the bilious, or bile-forming and fat, require less of that material than the nervous and often attenuated, whose restless and sleepless disposition forbids obesity.

The quality of the food consumed by an in-

dividual should be regulated, no less than its quantity, by the *activity of respiration*. This again is affected by temperature, and therefore by climate and period of the year. Compare the dense air and rapid breathing experienced on a cold day, or in northern latitudes, with the hot, light, vapid atmosphere and suffocating sighs as we approach the tropics. The respiration rises and falls inversely as the temperature, and an instinctive feeling suggests either the use or avoidance of fat, sugar, alcohol, and other substances which are readily consumed when the respiration is active, but which accumulate in the body as fat when that function is languid. The Highlander who breathes freely the cold mountain air, may drink draughts of raw whisky with impunity, but who does not sympathize with Lord Ogilvy's disgust for "hot rolls and butter in July?"

By a due supply of air, and by an active respiration, fat and fat-forming substances are consumed (being converted into carbonic acid

and water, which pass off as the breath), and by this process of combustion the warmth of the body is maintained. Should the respiratory process be *over*-active, then not only will the fat of the body be consumed, but the azotized textures, such as the muscles, are invaded, their carbonaceous portion is burnt off, so to speak, and the remainder appearing as an excess of lithates in the urine, may occasion irritability of the bladder. On the other hand, if the respiratory functions be inactive, the warmth of the body speedily subsides; and should the *clothing* be insufficient, then more warmth (more respiratory combustion) is needed, and therefore more fat in the food as fuel. The outcast may, therefore, be literally "starved with cold."

If, however, the supply of fat food should be somewhat guided by temperature and clothing, much more should it be regulated by *exercise and sedentary habits*. Active exercise quickens the respiratory process, oxygenates the blood,

and thus consumes the fat and fatty matters. Sedentary habits favour their accumulation, and the supply of fat should therefore vary with its expenditure. But exercise further implies the waste of the muscles, and indeed of every portion of the body, and this waste must be repaired by a due proportion of the azotized constituents of food. Repose, on the other hand, arrests the wear and tear of the textures, and therefore the demand for azotized food, which now accumulates in the blood. Hence follows gout, or perhaps rheumatism, with irritability of the bladder. But while "gout is the punishment (some have thought it the privilege) of the rich, of persons who live fully, luxuriously, and indolently, rheumatism is most frequently the appanage of the poor, and of those who toil."*

Daily occupation must be regarded as something more than exercise, and as implying the wear and tear of the nervous system. The materials for its repair should therefore be found

* "Principles and Practice of Physic." Dr. Thomas Watson.

in the food. Phosphates in the urine are partly the *débris* of the nervous system, and the late Dr. Golding Bird mentions the case of a well-known clergyman, who led a comparatively inactive life during the week, but who undertook the arduous duty of three services every Sunday. "This gentleman was a tall thin person, of dark complexion, lustrous eyes, and almost phthisical aspect. He was the subject of constant dyspepsia. The urine passed on Saturday evening, as well as on Sunday morning, although repeatedly examined, was healthy except in depositing urates, and being of high specific gravity. Before his Sunday duties were completed, he almost invariably experienced extreme fatigue, and a painful aching sensation across the loins, in addition to the flatulence and epigastric uneasiness under which he constantly laboured. The urine voided before retiring to rest after the severe exertions of the day, was almost constantly of a deep amber hue, high specific gravity, and deposited

the triple phosphates in abundance. The urine of Monday would contain less of this salt, which generally disappeared on the following day, and once more reappeared on the following Sunday evening. I had an opportunity of observing this state of things for several weeks, and it ultimately disappeared on the patient relaxing from his duties, and enjoying the amusement of travelling for a few weeks." Another gentleman "had suffered sad reverses —his irritability was most distressing, and rendered more intolerable by the severe efforts he made to restrain it."

Lastly. *Sleep* implies the temporary reduction of every destructive change, and therefore facilitates the perfect repair of the entire mechanism, and the re-adjustment of every function.

> "Sleep, that knits up the ravell'd sleave of care,
> The death of each day's life, sore labour's bath,
> Balm of hurt minds, great nature's second course,
> Chief nourisher in life's feast."—MACBETH, Act ii. Sc. 2.

The relation of sleep to food is here clearly

set forth by the poet of nature. Those who sleep much get fat, and, therefore, require less of that kind of food, and less meat also, and other azotized matters. Those who rise up early and are late to rest, and who eat the bread of carefulness and anxiety, require a more generous and nutritious diet. Nor can we doubt that habitual deprivation of sleep, whether from mental disquietude or as the result of late hours and dissipation, very much conduces to that enfeebled state of the nervous system with which is often associated phosphatic urine and irritability of the bladder. In such a case the rational treatment is—rest.

HABITUAL NEGLECT OF ABLUTION. THE RESTRAINTS OF SOCIETY.

I have hitherto considered those constitutional causes of the irritable bladder which operate by *adding* something noxious to the

blood, and which appears (as an excretion) in the urine, in the form of red or white sand, uric acid, urea, sugar, and so forth. I would now invite attention to the *retention* of certain excrementitious matters in the blood, or of the urine itself in the bladder, and this by the habitual neglect of certain very obvious sanitary requirements. The duty of the skin is supplementary to that of the kidneys in discharging from the blood the waste of the muscles and other textures. The function of the kidneys in this respect, no one can fail to disregard; for by the provision of an all-wise Providence, our instinctive feelings dictate the occasional necessity of relieving the bladder, and the temporary suspension of that necessity for even a few hours beyond the usual period would soon alarm. Not so with the skin: every one talks of the *pores* of the skin, but many overlook that *insensible* perspiration which silently, yet unceasingly, bedews the whole surface of the body. The skin is always

filtering away poisonous matter from the blood. And the pores should, therefore, ever be kept open.

I have known symptoms of poisoning ensue from the *habitual neglect of ablution*, especially of those parts, such as the feet and arm-pits, where the nature of the perspiration would seem to instinctively suggest its speedy removal. Yet, what says common experience? that day after day, weeks, months—ay years, may pass away, and even among the educated classes of society, with nothing more than dry-rubbing. Every bed-room should have a bath, and its use should be a matter of education. By neglecting this precaution, the pores become stopped up, and the poisonous excrement is partially retained in the blood. The same pernicious consequences then ensue as from over-eating animal food. The kidneys are over-worked in their endeavour to relieve the system; the urine becomes highly acid—perhaps deposits red sand, and irritability of

the bladder supervenes, with other constitutional derangements, which for my present purpose I need not specify.

If, then, we admit the value of habitual ablution to every individual, and its relation to public health, I would here take occasion to introduce (although digressing from the purpose of this memoir), the substance of a few suggestions which I lately threw out on Sea-bathing. These remarks are not addressed to invalids, but to healthy pleasure seekers.

"Those to whom I refer should keep in view the purpose of bathing, whether in salt or fresh water. Unquestionably one intention, that of cleanliness, cannot be overlooked; but immersion produces further results. These results are affected by various circumstances, and more especially by *the temperature of the water*. Thus the warm bath directly stimulates the skin and excites the circulation; but this effect too frequently issues in exhaustion, and is not therefore generally conducive to

health. The tepid, or rather, the cold bath, may also produce exhaustion, but more generally its influence is refreshing and invigorating. These beneficial results are preceded by temporary pallidity or blueness of the skin, now bloodless and shrivelled. The heart, if healthy, soon beats with renewed vigour, and speedily restores the balance of the blood's circulation, thus producing a general glow, refreshing the strength and exhilarating the spirits. Or again, should the heart labour in vain to restore the general circulation, then a sensation of chilliness supervenes, with prostration of strength, dejection of spirits, and headache; while, in addition to these symptoms of a congested brain, bordering on apoplexy, other internal organs also give proof of their being overloaded with blood, and hence the oppressed breathing—perchance the diarrhœa—and other symptoms of a sluggish circulation. These evil results of cold bathing, no less than its beneficial effects, are alike modified by indi-

vidual peculiarities of *temperament, by age, sex,* and other circumstances compatible with health; but such peculiarities may all be referred to individual powers of reaction after exposure to cold. The experience of each individual is therefore the best guide to bathing, at the same time certain general directions should be observed.

Firstly, cold bathing should not be indulged in when a sensation of chilliness is felt, but rather when the *surface is warmer than usual,* and this condition should be promoted by previous exercise if necessary. On the other hand, the *exhaustion of recent fatigue, not yet repaired by adequate sleep,* is also a condition unfavourable to healthy reaction. Well do I remember the old posting days, when a journey to Hastings or St. Leonards was indeed a tedious undertaking; and I also remember the depressing effect of that "dip the first thing in the morning" after our late arrival over-night.

Again, *the evil effects of bathing on a full stomach* are known to every one, but the debility occasioned by *prolonged fasting* is (equally with fatigue) unfavourable to healthy reaction. This circumstance is generally overlooked by families in their arrangements at the sea-side. The habit of dining, say at 4 P.M., in order to enjoy a drive or walk in the cool of the evening, occasions too long an interval of fasting until the following morning—the period of the day usually selected for bathing. Under these circumstances, should bathing be indulged in before breakfast, I have known the usual headache, lassitude, and chilliness prevented by a crust of bread and cup of milk.

So much for one or two general directions concerning the influence of bodily condition on healthy reaction after bathing. I would now invite attention to *those circumstances which affect the temperature of the sea*, and thus relate to the same desirable result. I need scarcely notice the *period of the year* in respect to sea-

bathing, for it is only during a certain period that such bathing is prevalent. During the months of July and August the average temperature of the sea varies from 60 to 70 degrees Fahrenheit, but that temperature must also vary with the *period of the day*, and is moreover influenced by *the ebb and flow of the tide*. At high water (say 3 or 4 P.M.), the temperature of the sea is from 10 to 12 degrees Fahrenheit above that at low water (say 8 P.M.). This difference of temperature is due to the sun (if fine weather) having heated the sand at low water, which gives out its heat during the returning flow of the tide. Those who are susceptible of taking cold should therefore not select an undercliff situation unless exposed to the early sun. Moreover, they should choose a sandy shore, and wait until that period of the day when the returning tide has been long heated by the sun, and warmed, moreover, by the surface of heated sand. With these precautions those who have

hitherto suffered from headache and lassitude after ordinary bathing may enjoy an almost tepid bath. This convenience, resulting from situation, may be found at Hastings and St. Leonards, Eastbourne, Brighton, Ramsgate, Margate, and other watering-places along our southern coast.

The foregoing remarks respecting the temperature of the sea, apply only to fine weather; for should the sun be overclouded and the sea rough, then the conditions to which I have alluded will necessarily be disturbed. This leads me to observe that *the direction of the wind* also influences the temperature of the sea. A cold east or north-east wind will not only so mingle the water as to reduce its general temperature, but will also, as it were, fan its surface cool. I need scarcely add that the bather during a fresh breeze should be as much as possible under water, and not exposed to the cooling action of evaporation. The most healthful *period for remaining in the*

water is also important. I have read somewhere of certain experiments which were made to determine this question. By placing a thermometer in the mouth it was ascertained that the greatest loss of heat ensued in about two minutes after immersion. This would seem to be about the period when reaction commences, and that the temperature of the body rises gradually until the expiration of from ten to twelve minutes, although it may then be lower than before immersion. I would not, however, limit the period of immersion to two minutes, but would suggest the propriety of entering the water only once, and of not reducing the temperature of the body still lower (and with it the probability of reaction), by repeatedly emerging, and thus exposing the skin to the cooling action of evaporation. True it is that sea-water more surely and speedily causes reaction and glow, and may, therefore, be indulged in for a longer period without exhaustion, than fresh-water

bathing. This difference is due to the stimulating properties of sea-water, and herein resides the only circumstance peculiar to sea-bathing. In all other respects the same advantages may be derived from fresh water, but sea-bathing is more stimulating, refreshing, and bracing; nor can these beneficial effects be produced by any artificial solution of salts in water. Sea-water moreover evaporates more slowly, and hence the well-known fact of "not taking cold" so readily after sea-bathing. But another result is apt to ensue, equally uncomfortable, if not equally injurious. I allude to dryness of the skin with general feverishness, not to mention certain freckles which somewhat disfigure for awhile the fair nymphs of the ocean. To obviate this objection, I would suggest that each bathing-machine should be furnished with a bucket of fresh water, and that on emerging from the sea, and while yet on the steps of this machine, this water should be used as convenience may

suggest. Nor should the hair be kept dry or protected by any kind of cap. The headlong plunge so much insisted on by some, is not essential to healthy reaction, and is, moreover, actually conducive to headache and lassitude. The bather should enter the water, and immerse the chest (to prevent convulsive breathing) as soon as possible, and the head should be dipped immediately once or twice. On re-entering the machine, the head should be washed with fresh water, and thus the hair may be preserved smooth and soft, and will not become crisp and coarse, as every one must have seen or experienced. If after this precaution the daughters of Neptune should choose to unloosen their tresses to the breeze, they may do so without the slightest risk of hair-splitting. I remember—but no matter; 'tis more the fashion now to roll the wet hair up in a ball, and thus insure many a cold and headache.

Such then are a few suggestions that I would

offer to healthy sea-bathers; and I trust they may prove useful and acceptable. The value of sea-bathing should, however, be estimated not merely by its efficacy in purifying the blood of certain poisonous matters, but also as a method of gratefully stimulating the nervous system, and of bracing and invigorating the circulation. In sad contrast with this healthful condition, is that peculiar feebleness which ensues from a phase of our social existence to which I would now invite attention.

IN-DOOR LIFE AND CONSTITUTIONAL IRRITATION —SOFA-LIFE — CLOSE ROOMS — INDOLENCE AND MENTAL ENERVATION, WITH SUPPRESSION OF THE NERVOUS FORCE AND IRRITABILITY— HYSTERIA AND ITS CONSEQUENCES—MENTAL MALADIES AND THEIR INFLUENCE.

On whatever variety of constitutional disease we turn the mirror of daily life, we see reflected the habits of society; but there is perhaps no morbid condition of the system which

reflects so clearly certain phases of social life as Constitutional Irritation. The late distinguished Mr. Travers thus defines Irritability: "Every part of a living animal has its peculiar function, to the performance of which it is incited by an appropriate stimulus. Its susceptibility of the impression of such stimulus is denominated its Irritability. This property is not confined to any particular form of organization, as nerve, muscle, or blood-vessel; it exists in every organ, simple and compound." Irritability, therefore, expresses *susceptibility*, but is not aught distinct from the several functions themselves of the various organs which together form the living body. The transition from healthy to morbid irritability is obvious. "Every organ has its peculiar mode of irritability. So long as it neither exceeds nor falls short of its due proportion, the *harmony* of the system, resulting from that of its constituent organs, is strictly preserved. But by a variety of causes, both internal and

external, it is subject to be so augmented, diminished, or perverted, as to constitute a material deviation from health, or an actual morbid condition!"* Thus, I may add, the equilibrium of the functions is overbalanced, and the harmony of the system is disturbed; in fact, *Constitutional* Irritation ensues; and the urinary bladder may be one organ whose functional activity preponderates.

But the property of irritability is sometimes regarded as belonging more peculiarly to the muscular system, and to those parts, such as the bladder, which contain muscular fibres. "When a muscle, or a tissue containing muscular fibres, is exposed in an animal during life, or soon after death, and scratched with the point of a knife, it contracts or shortens itself, and the property of thus visibly contracting on the application of a stimulus is named

* "An Inquiry into that Disturbed State of the Functions, usually denominated Constitutional Irritation." By Benjamin Travers, F.R.S.

'vital contractility,' or 'irritability,' in the *restricted* sense of this latter term."* This contractile power may exhibit itself in either of two ways: by its strength (or force), or by the rapidity and repeated occurrence of contraction; and the rapidity and frequent recurrence of contraction are perhaps more especially implied by the term muscular irritability. The strength or force of muscular contraction, coupled with its (long) duration, is spoken of as its *tone*, and this phase of irritability is manifested by muscles in an inverse proportion to the rapidity of their contraction. A strong muscle contracts slowly, and endures; a weak muscle rapidly, repeatedly perchance, but ineffectually. When, therefore, the muscles become flabby and weak from *insufficient exercise*, any tissue or organ which contains muscular fibres may then be over-ready to contract, or over-irritable; and thus irritability of the

* "Elements of Anatomy," edited by Professors Sharpey and Quain.

urinary bladder may be one result of *general* debility. In this way the enfeebling influence of a sofa-life, so frequently indulged in by hysterical persons, with also the recumbent position for presumed spinal disease, may favour that excessive irritability of the bladder which is frequently experienced under such circumstances. This remark is quite compatible with, and indeed corroborated by, the observation of a recent writer, who notices the common association of hysteria with muscular debility from over-exercise,* an error which, no less than the habitual indulgence of repose, conduces to hysteria.

In fact, whatever occasions loss of strength, indirectly elicits an unduly susceptible, or weak and irritable state of the whole muscular system, including muscular organs, such as the urinary bladder. Hence the trembling agitation—the rapid breathlessness—the palpitating heart—the frequent diarrhœa, and undue irri-

* "Spinal Irritation." By Thomas Inman, M.D.

tability of the bladder, which severally distress the feeble and often nervous victims of an in-door life. Think of the factory girls of England.

Nor can we overlook the evil influence of *hot and close rooms*, such as are habitually experienced in private life, during "the season," and at operas, theatres, and nearly all other places of public resort. The hot and over-breathed air of such places impairs the strength and promotes irritability, and this by a twofold mode of operation. The blood of any one who is already half-suffocated cannot be oxygenated, nor can his strength be renewed by draughts drawn from an atmosphere which is itself, in great measure, the breath of others. But the heat of a close and over-breathed atmosphere is also prejudicial by directly exciting the circulation of blood, and by thus promoting the rapid and ill-regulated secretion of urine, which stimulates the bladder to prematurely relieve itself of its contents. I men-

ion this one result of a heated atmosphere as being an illustration of irritability consistent with the design of this memoir; but the breathlessness and palpitation which accompany general debility are aggravated by the exhaustion experienced in over-heated (no less than in confined) apartments. We could readily adduce many illustrations of this view; but it would be idle to enumerate the results of common experience. I pass on to another aspect of in-door life, and one which prevails much among those who suffer from hysteria; and as the pathology of this morbid condition of the nervous system may, I think, be elucidated by reference to the social circumstances amid which it arises, I would first trace the results of *indolence and mental enervation*, through suppression of the nervous force, thence to constitutional irritation. We should remember that health implies not only the *due balance* of the various functions taken *collectively:* of the digestion of food—the circulation of blood—

the respiration of pure air—the excretion of noxious matters from the blood, as the urine, perspiration, *et cetera*, and the influence of the nervous system ; but implies also (that which is not sufficiently noticed in books), the harmony of the several *elements of each* function. Thus, for example, the process of digestion implies the co-operation of a certain supply of blood to the stomach and intestinal canal, with a certain muscular propulsion of the food through the stomach onwards, and, lastly, that both these requirements should be regulated somewhat by the influence of the nervous system. If, therefore, one or other of these elements be deficient, or excessive, the process of digestion is interrupted in a corresponding degree, and hence the varieties of indigestion as already explained. Analogous elements are associated in each of the other compound functions, and the suppression or predominance of *any one element*, presents analogous varieties of functional disturbance. Thus the functions

of the brain and spinal cord, taken as a whole, imply the harmony of the *mental faculties*, coupled with sensation and volition; and, further, that these endowments should co-operate with those *involuntary* motions which are chiefly due to the agency of the spinal cord. These endowments of the central nervous system are duly balanced in health. Each, however, is liable to be unduly excited or depressed, and I need only enumerate the well-known morbid conditions of excessive and defective sensibility, paralysis, convulsive movements, *et cetera*.

Further, the functional elements in question obey this remarkable pathological law, that if the phenomena which should be manifested by the brain are *temporarily* suspended (but not destroyed), then those of the spinal cord are unduly excited. Hence the characters of Epilepsy when fully developed—namely, suspension of consciousness, coupled with convulsive movements of the limbs and trunk. The operation of this pathological law, illus-

trated by Epilepsy, has, I think, hitherto been overlooked. It points to—I do not say proves—a new physiological principle, which I would term the *Unity of the Nervous Force.* By virtue of this principle—the temporary suspension (not destruction) of that force in one portion of the central nervous system is necessarily accompanied by its undue display in another direction; and its excitement in one portion is as necessarily followed by its exhaustion in the remaining portion of the system.

The application of this law would, I think, sufficiently explain the immediate nature of other nervous diseases, which I may take another opportunity of alluding to, and, moreover, guided by the same law, we may detect the evil influence of certain habits of society in producing that morbid condition known as "nervous excitement." It may be, that the social condition of an individual exempts him (or her) from the necessity of any

daily occupation. The intellectual faculties, not being roused by the stimulus of any professional avocation or the pursuit of trade, are prone to inactivity. The nervous force must therefore find some other outlet. Under such circumstances, the *emotional* faculties are apt to predominate. Hence the origin, or at least one source, of that peculiar morbid susceptibility, the sensitiveness of those who are "all feeling," hence that restless apprehension of some impending evil, the very offspring of luxury and ease—hence that suicidal melancholy, "which rejoiceth exceedingly and is glad when it can find the grave." It was thus that the fortitude of our great Lord Clive gave way: not when starved down during fifty days at the siege of Arcot; nor when, by day and night, marching against Bengal, with the eager announcement of his coming, "Tell Meer Jaffier to fear nothing; I will join him with five thousand men who never turned their backs:" not in that critical hour of self-reliance, did

Clive's dauntless spirit falter, for there is, I believe, a period in the life of "every man of work," when his whole intellectual powers are aroused, and in their turbulent activity the nervous energy of India's conqueror found vent; but in the quiet evening of life, when the revulsion of that energy ensued, then reappeared the spectral melancholy of his early days—

He heard a voice we do not hear, which said he must not stay;
He saw a hand we do not see, which beckon'd him away.

If, however, through intellectual lethargy, the emotional faculties are thus unduly developed, then another phase of the nervous force may present itself in certain individuals. Their general *tactile* sensibility may be exalted, even to pain. An original writer truly observes, "Such persons are commonly called nervous. They are worried with trifles, startled at shadows, distracted by noise or bustle, never free from some ache or pain, almost every feeling is suffering; what in others would be slight

pain, in them amounts to agony. Hence they are perpetual invalids, quite unfit for the rugged path of life, over which they walk, as it were, barefooted and thin-skinned."* I remember to have read somewhere a very graphic description of such an individual—

"In every age and country there lives a man of pain,
Whose nerves like chords of lightning shoot fire into his brain;
To him a word's a sting—a look or sneer a blow,
And more in one short hour he feels, than some in ages know."

The physiological truthfulness of the sentiment certainly surpasses the poetry of these lines.

This fiery condition of the nervous system is more frequently experienced in certain parts of the body. Of these I may mention, that piercing kind of headache known as *clavus hystericus;* spinal and abdominal tenderness; pain in the breasts and joints; and other varieties of local nervous affections. Read the testimony of a high authority.

* Dr. C. J. B. Williams, "Principles of Medicine," "Excessive Sensibility."

"I do not hesitate to declare that among the higher classes of society, at least four-fifths of the female patients who are commonly supposed to labour under diseases of the joints, labour under hysteria, and nothing else." "This liability to hysteria is, in fact, among females one of the several penalties of high civilization. It is among those who enjoy what are supposed to be the advantages of affluence and an easy life that we are to look for cases of this description; not among those who, fulfilling the edict of the Deity, "eat their bread in the sweat of their face."*

Again, one or more of these local manifestations of undue sensibility may be associated with some perversion of one or other of the special senses. The taste may prefer wormwood to honey, and chalk rather than cheese, the eye may be intolerant of light, every smell may be a stench, and every sound a discord.

* "Local Nervous Affections." By Sir B. C. Brodie, Bart., &c. &c.

To these depraved sensations may be added certain functional derangements of the internal organs, proceeding from excitement of either the great sympathetic, or spinal nervous systems. Through either channel the nervous force may, as it were, find vent. Thus may we explain that distressing sensation of choking and constriction of the throat (globus hystericus), with hoarseness, perhaps loss of voice, which arises under "nervous excitement;" the diarrhœa, and perchance vomiting, which may ensue under similar circumstances; the occasional hiccough, dry loud cough, breathless agitation, palpitation, and *irritability of the bladder*, which are apt to supervene. Lastly, these phases of nervous excitement may occasionally terminate in a sudden and violent paroxysm, or fit, of *involuntary* movements, and which indicate a further expenditure of nervous force derived from the central reservoir.

Such, then, are certain functional distur-

bances of the nervous system, which, taken collectively, have received the inappropriate name of HYSTERIA—a word which, from its etymological meaning, would imply some disease of the uterus; yet *I* would rather define it to be, a disturbed balance of the nervous force, whereby its temporary suppression in one direction, determines its undue preponderance in other parts of the body. These local manifestations of the nervous force are not peculiar to either sex, but are occasionally witnessed in males, as the experience of every medical observer, and indeed common experience, will testify.

Guided by that view of the pathology of hysteria which I have endeavoured to establish, we may, I think, readily explain the more frequent occurrence of this disease in the female. The independent dissections of Dr. Robert Lee and of Dr. Snow Beck demonstrate that the uterus is abundantly supplied with nerves, by virtue of which that organ is

so intimately related to the entire nervous system, as to respond most promptly to its prevailing condition, whatever that may be. We are, therefore, prepared to recognise in the "uterine excitement" of hysteria a mere discharge of superfluous nervous energy, an excitement, only in proportion to those large plexuses of nerves with which the uterus is so plentifully supplied. The nervous excitement of hysteria does not emanate from the uterus, for in many instances the function of menstruation is only *secondarily* impaired; while in other cases, that function is fulfilled regularly and sufficiently, and the organ itself presents no organic disease or displacement. In a series of cases recently published by Dr. Robert Lee may be found such as the following:—

"Married, barren, age 26. — Hysteria in early life: in good general health until her marriage six years ago. Catamenia regular. Now suffering from hysteria in a violent degree—no disease of the uterus."

2. "Single, age 38.—Had suffered long from nervous weakness and inability to walk. July, 1849, was examined with the speculum at New York, and repeatedly cauterized. On returning to London consulted a practitioner, who stated, after using the speculum, that there was prolapsus and retroversio uteri: the prone position was recommended and observed during nine months. Twelve months ago ceased to lie with her face to the ground, and was declared to be quite cured. Soon after began to suffer from headache, lowness of spirits, and lost the power of walking in public—in private, she could walk like other people. Then consulted a somnambulistic mesmerist, who declared there was disease both of the uterus and spine. Present state—uterus healthy, but suffering from hysteria."

3. "Single, only 19.—Had been suffering for some time from hysteria and almost total inability to walk; recently went to Scotland, when she was rendered insensible by chloro-

form, and an unsuccessful attempt made to introduce a speculum or some metallic instrument into the vagina. Suffered violently after this attempt. Present state—hymen lacerated, vagina contracted, os and cervix uteri in the most healthy condition, and not displaced.—Suffering severely from hysteria."

4. "Single, age 20.—Always hysterical; was about to be married contrary to her inclination, and was in the country during the summer in her usual health, when a practitioner looking steadfastly at her said, 'I am sure there is something wrong with your womb.' Being alarmed, she permitted him to examine her with the speculum, and received the information that the mouth of the womb was ulcerated. She was five weeks under his care, during which time she was cauterized almost daily. On leaving the watering-place where this occurred, she was recommended to place herself immediately under the care of Dr. ——. She has been speculumized again,

but the ordinary medical attendant stepped in and stopped the cauterizing. Gushes of water are now said to take place from the uterus.* Os healthy and closed."

5. "Married, barren, age under 30.—Hysterical fourteen years, and ill during the whole of that time from supposed inflammation of the bladder.† Scalding in passing urine, and great aching before and after, throbbing in the epigastrium; catamenia regular, but very profuse. During nine years has been under the care of a London physician for 'inflammation and ulceration of the womb.' Leeches applied many times. 'I cannot tell,' says she, 'the number of times the speculum has been used and the caustic.' No displacement or organic disease of the uterus detected."

6. "Single, age only 18.—Previous history. For some time past had suffered from hysteria, nervous weakness, inability to walk, dysme-

* Or from the irritable bladder?—F. J. G.

† Or irritability of the bladder?—F. J. G.

norrhœa and leucorrhœa. Was persuaded to consult a London practitioner. When examined, engorgement and ulceration of the cervix reported to be present. The usual treatment followed, and was often 'touched with caustic.' During twelve months she lay upon the couch and read novels. Present state—no disease or displacement of the uterine organs. Relatives state 'her character is totally changed, that she is completely vitiated, and that after being long in the hands of this practitioner, she could not be got out again, being so infatuated with the affair.'"

7. "Married, age 36. Previous history.—Some accident during her first labour. In the interval of three years between the birth of her second and third children, was under the care of two physicians in London, who employed the speculum and caustic frequently during many months. Three hundred leeches were also used externally, by which her strength was greatly reduced; gradually was restored

to health, but relapsed, and 'again went through the same mode of treatment at intervals.' Last delivery took place six years ago; since then has been suffering 'from violent sickness and spasm, hysteria, palpitation of the heart, exhaustion,' and inability to walk. Mercurial suppositories twice weekly; croton oil rubbed externally. Present state—in a state of great debility; swelling of feet and ankles, palpitation of heart, profuse leucorrhœa, unfit for any duty in life; no disease of uterus detected. The health of the patient was in time completely restored by rational *constitutional* treatment."

8. "Single, age 23. Previous history.—Ill during six years, owing, it was supposed, to riding on horseback. Catamenia regular, but painful—*frequent desire to relieve the bladder;* fits of hysteria; constant headache, 'sense of pressure on the top of the brain.' Examined with speculum, and caustic frequently applied; violent uterine excitement followed, and im-

moral habits, which rendered her miserable. Present state—no organic uterine disease."

These cases speak for themselves. What, then, is the rational, remedial (and preventive) treatment of hysteria, and, therefore, of one very frequent constitutional cause of the irritable bladder? Pathology suggests the answer—Certainly not the rash, repeated, and demoralizing introduction of a speculum to look after what? "a prominent spot of varying size"—"a something raised"—"an abrasion," or "erosion?" Certainly not the indolent indulgence of a sofa life. No; nor yet a round of fashionable excitement; but the due and daily occupation of the mind and heart with something better than mere passing circumstances; the *pursuit* of some *object* in life worthy of a rational and responsible being—the natural fulfilment of the instinctive feelings—a timely and well-assorted marriage—in fine, the *equable adjustment* of every endowment of the nervous system—intellectual,

moral, and physical. To this end, the resources of medicine may conduce, but cannot compensate for the want of those requirements to which I have alluded. I shall notice the medicinal treatment of hysteria in the sequel; meanwhile, my interpretation of the pathology of this disease will, I think, explain the sympathy which subsists between distant parts of the body, both in health and disease, through the agency of the nervous system. This sympathy between the *bladder* and the *brain* may be observed occasionally in certain cerebral conditions. "An elderly man, for example, complains of frequent attacks of giddiness. Sometimes in walking his head turns round, so that he is in danger of falling, and this symptom probably arises from an altered structure of the arteries of the brain, causing an imperfect state of the cerebral circulation. This state of things is sometimes attended with an irritable condition of the bladder; and although the urine is of a healthy quality,

and the bladder itself is free from disease, the patient is tormented by a constant micturition, voiding his urine without pain, but at short intervals, and in small quantities at a time."*

This disease is, perhaps, incurable; but, as Sir Benjamin Brodie truly remarks, by correct diagnosis, we may avoid useless remedies.

The sympathy between the urinary bladder and the brain is illustrated, occasionally, by the influence of certain *mental maladies;* but I shall reserve my notes on this subject for a future occasion.

PREGNANCY MISMANAGED.

Having now considered those constitutional conditions, as they originate in the habits of society, of which irritability of the bladder is one very frequent and troublesome result, we approach the consideration of the *local* causes of this functional disturbance. There is one

* "Lectures on the Diseases of the Urinary Organs." By Sir B. C. Brodie, Bart.

cause, however, which although of direct local operation on the bladder, is yet so constantly the result of habitual self-neglect as to demand our special attention. I allude to the mismanagement of Pregnancy. When conception commences, the ordinary functions of the uterus undergo a very remarkable change. Menstruation ceases as pregnancy begins. From the moment of conception the uterus gives warning to every part of the body of the changes which are going on within itself. At all times a vascular organ, and plentifully supplied with nerves, the gravid uterus becomes more vascular, and perhaps its nerves enlarge; and possessing these vital endowments, the uterus communicates through the vascular and nervous systems with organs most distantly removed from its own locality. A slight rigor or perhaps feeling of faintness may be the earliest constitutional symptom of pregnancy; or, perhaps, a slight febrile paroxysm may ensue. Very soon the whole body responds to the

vital activity of the uterus. So all-pervading are the nervous endowments of the gravid uterus, that in this respect it may be regarded as almost *a second brain*, influencing and regulating the most distant organs during the whole period of pregnancy. Headache frequently supervenes. The natural temper and disposition of the woman may be altogether changed. The gentle and subdued may become irritable, and the melancholy become cheerful. Severe pains dart about the body, now affecting a single tooth (which may not be decayed), and anon settling for a time in the ear and face, or shooting through the breasts. The heart not unfrequently palpitates and distresses, while a troublesome spasmodic cough denotes the sympathy of the respiratory organs. Very shortly the digestive organs sympathize. The most extraordinary perversions of taste may occur, with a desire for cheese, pickles, or even for chalk and other unnatural substances. The mouth may over-

flow with saliva, and the well-known nausea and morning sickness of pregnancy prove the intimate sympathy of the stomach. No less are the intestines engaged, for a troublesome and perchance dangerous diarrhœa may set in. And, lastly, incessant irritability of the urinary bladder. Thus every portion of the body responds more or less in turn to the influence of the gravid uterus, although its agency varies in different women. But the natural irritability of nearly every organ during pregnancy may obviously be regulated and subdued if excessive, by excluding those who are nervous and weak, from undue participation in the pleasures, or even the ordinary duties of life. Rest and seclusion from society as pregnancy advances, will do much to control many unpleasant symptoms, which medicine can in no way remove, or even mitigate. The management of pregnancy is, therefore, a question of much interest, and of direct applicability to the treatment of many cases of irritable bladder. Its

importance in relation to this condition should, however, be estimated by the *obstinate constipation* which is apt to occur during pregnancy, and I would therefore offer a few remarks on this very frequent local cause of the irritable bladder.

PART II.

LOCAL CAUSES OF IRRITABLE BLADDER.

HABITUAL CONSTIPATION AND DISEASES OF THE RECTUM—ABSCESS IN THE NEIGHBOURHOOD OF THE BLADDER—FISTULA IN ANO—DISPLACEMENTS AND DISEASES OF THE UTERUS—STRICTURE OF THE URETHRA—ENLARGED PROSTATE—OVER-GROWTH OF THE BLADDER—CANCER—STONE IN THE BLADDER—INFLAMMATION.

HABITUAL CONSTIPATION.—My own professional experience of the middle, and occasionally of the upper classes of society, convinces me that the error of habitual constipation from neglect of the suggestions of nature is still one of very frequent occurrence. False delicacy too often overrules the laws of nature in respect to the alvine evacuations, and torpidity of the bowels ensues from habitual inattention to her dictates. The result is obvious. The bowels

being loaded with feculent matter endeavour in vain to expel their contents. Hence they accumulate near the outlet of the rectum; the fluid portion of such matter is absorbed, and direct irritation of the adjacent bladder is apt to arise from pressure of the hard, dry, and impacted mass. This result is more likely to occur during pregnancy. As the gravid uterus enlarges and encroaches on the capacity of the bladder and rectum, between which it intervenes, less space remains to accommodate any accumulation of fæces in the rectum. Such an accumulation frequently occurs during pregnancy, even although the bowels may apparently be relieved day by day; and therefore constipation and irritability of the bladder are frequent concomitants of pregnancy. Due attention to the suggestions of nature, aided by mild laxative medicines, such as castor-oil, will do much to relieve this troublesome local affection, and to prepare the way for a safe and easy delivery at the proper time of birth.

The use of the lavement has been daily resorted to in cases of constipation; but the tone of the bowel is eventually impaired by the repeated adoption of this practice. In certain cases of habitual constipation, it may prove necessary and useful, for we can scarcely hope to regulate the bowels by medicine when constipation is due to torpidity of the rectum. The injection of a little *cold* water occasionally will often give the desired relief. The local irritation at once subsides, and the mental depression, which may have been suicidal, passes away as a morning mist disperses before the rising sun. The following anecdote is recorded of Voltaire:—"An English gentleman of fortune had been sitting many hours with this great wit and censurer of human character. Their discourse related chiefly to the depravity of human nature, tyranny and oppression of kings, poverty, wretchedness, and misfortune, the pain of disease, particularly the gravel, gout, and stone. They worked them-

selves up to such a pitch of imaginary evils, that they proposed next morning to commit suicide together. The Englishman, firm to his resolution, rose, and expected Voltaire to perform his promise, to whom the genius replied, 'Ah ! monsieur, pardonnez moi, j'ai bien dormi, mon lavement a bien operé, et le soleil est tout-à-fait clair aujourdhui.'"* Byron said that a dose of salts was more exhilarating to him than a bottle of champagne ; and in one of his letters, "I am suffering from what my physician terms 'gastric irritation,' and my spirits are sadly depressed. I have taken a brisk cathartic, and to-morrow 'Richard will be himself again.'" The local results of constipation of the rectum are illustrated, not only by irritability of the adjacent bladder, but also by irritation of the uterus ; and I have seen cases of leucorrhœa and hysterical symptoms, which were aggravated by this form of constipation, if indeed they were not entirely due to that cause.

* "The Anatomy of Suicide." By Forbes Winslow, M.D.

Certain diseases of the rectum may likewise induce similar local results. Hæmorrhoids may be accompanied by much pain about the neck of the bladder, with a frequent desire to pass water. I have almost invariably found the following laxative of great service in this distressing condition :—

℞ Potassæ bitartrates
Pulveris sulphuris āā equales partes ;
Mellis, quantum sufficit ut fiat electuarium.

One teaspoonful of this electuary may be taken every night, if necessary ; and its beneficial effect aided by the topical application of the Goulard lotion, or by the use of the unguentum Gallæ.

Irritability of the bladder is occasionally produced by fissure of the anus and lower portion of the rectum. This rent (of the mucous membrane) of the bowel may extend only so far as the skin, and be scarcely visible externally ; but the local irritation and acute pain will suggest to the surgeon the propriety of making a further

examination, and thus lead to the discovery of the real source of mischief. Inflammation, with or without ulceration of the rectum, may occasion irritability of the bladder; and stricture of the bowel, whether malignant or not, may torment the sufferer with the most distressing desire to void the last drop of urine. Lastly, abscess in the neighbourhood of the rectum, as for instance in the ischio-rectal fossa, or between the prostate and rectum, very constantly produces frequent and difficult micturition.

An abscess about the rectum should be opened freely and at an early period. But the skin around the anus may be so thick and brawny as to disguise the usual character of an abscess, and disarm all suspicion that suppuration has commenced. Moreover, as suppuration proceeds, the matter may find its way backward and upward, along the bowel, for a considerable distance, rather than *point* towards the unyielding skin. When, therefore, at any

spot the slightest *fluctuation* is perceptible, then and there should a bistoury be entered, and the opening freely enlarged, if matter is discovered. I think that by this active precaution, I have, in many instances, at the Royal Free Hospital, and elsewhere, prevented a worse result. For, when an abscess in the neighbourhood of the anus has burst spontaneously, it may contract and partially close up, leaving a narrow channel which opens either externally at some spot in the vicinity of the anus, or internally, into the bowel, or communicates both externally and internally, constituting a *complete* fistula in ano. Either of these conditions is accompanied by a constant fetid purulent discharge, with much pain, irritation, and misery, which undermine the general health.

The introduction of a probe, or director, through the external opening in the skin, will guide to the internal opening, should it exist, or to a spot where the bowel is thin and about

to give way. Then the forefinger (of the other hand) should be introduced into the rectum until it rests upon the point of the director. A curved, sharp-pointed bistoury should be introduced through the external orifice of the fistula, until it touches the finger in the rectum, when the sinus should be freely laid open into the bowel, and afterwards dressed and healed from the bottom. If more than one sinus exists, similar proceedings are necessary. This operation will alone insure a radical cure, but requires some caution in its performance. The introduction of a sharp-pointed and cutting instrument along a fistula in ano is attended with some risk. Percivall Pott said, truly, that "in all chirurgic operations the instrument made use of cannot be too simple, nor too keen, and, if possible, should never be out of the sight, or the direction of the finger, of the operator; and whenever it is (as must sometimes necessarily be the case), it is liable to some degree of uncer-

tainty;" but the fistula knife (if pointed and so keen) may pass out of the sinus towards the bowel, or even towards the bladder. I do not say that such a catastrophe will happen in the hands of an experienced surgeon; but I do say, that the ordinary bistoury in use is not adapted, by its construction, for the operation for fistula in ano. Having myself experienced some inconvenience in the use of a bistoury with an unprotected blade, I lately invented *a concealed knife*, which has the appearance of an ordinary director, with the handle of a scalpel. This director is passed through the fistula into the bowel, when, by touching a button on the back of the handle, the instrument is at once converted into a knife, having a sharp point (which should then be passed through the bowel, if the fistula be incomplete), and the operation finished in the usual manner. Thus, the previous introduction of first a director, and then a bistoury, is unnecessary. The operation is begun and

completed with but one instrument, and by a more simple, a more safe, and speedy operation.

This *fistula knife concealed*—when made of a smaller size—I have found very useful in cases of phymosis, by simply passing it under the foreskin, which is then drawn back with one hand as the instrument is withdrawn by the other. I may mention that in many cases of phymosis it is unnecessary to divide the whole thickness of the prepuce. If the under thin skin *only* is divided, the prepuce may frequently be drawn back without dividing the outer more sensitive skin. The retracted foreskin should then be enrolled in a slip of wet lint; no sutures are required, and this more simple operation is attended with less hæmorrhage, far less pain, and eventual disfigurement.

A modification of the same instrument is equally useful as a *guarded hernia knife* for division of the stricture of hernia.*

I would take this opportunity of mention-

* All these instruments are admirably made by Messrs. Weiss and Sons, Strand, London.

ing that I cannot coincide in the statement advanced by M. Ribes in 1820, and previously, I believe, by Sabatier, that the inner opening of a fistula in ano is never higher up in the bowel than five or six lines from the anus. This view is supported by no less an authority than Sir B. Brodie, who says, "The inner orifice is, I believe, always situated immediately above the sphincter muscle, just the part where the fæces are liable to be stopped and where an ulcer is most likely to extend through both the tunics." The equally high authority of Mr. Syme, and the special observations of Dr. Bushe of New York, tend to the same conclusion; but Mr. Curling disproves this conclusion of M. Ribes, and although Mr. Quain does not take up the question in his valuable clinical lectures on *Diseases of the Rectum*, yet the facts there adduced equally disprove the statement of M. Ribes. In Case 29 of the lectures referred to, the inner opening of the fistula was more than two inches up the rectum, and it was situated equally

high up in Case 32. I would add, that I lately operated on a man (in the hospital) for complete fistula, the inner orifice of which was three inches from the anus; and in this case I also removed a portion of dead bone from the tuberosity of the right ischium, after which the patient recovered.

DISPLACEMENTS AND DISEASES OF THE UTERUS

Might readily be supposed to disturb the function of the bladder. The contiguity of the uterus and bladder, and the vascular and nervous connexion subsisting between these organs and the rectum will fully explain their mutual sympathy. Displacements of the uterus and vagina operate mechanically. Prolapsus vaginæ pulls down the bladder, and thus induces irritability or perhaps incontinence; and prolapsus uteri operates in a similar manner, and at a very early period of such displacement, before the position of the bladder is

altered. Acute inflammation of the uterus is noticed by Dr. H. Bennet as a local cause of vesical irritability; and cancer and fibrous tumours of the uterus have a similar effect on the bladder.

STRICTURE OF THE URETHRA.

Stricture of the urethra is a well-known local cause of vesical irritability. Among the advanced symptoms of this disease there is none so constant, painful, and distressing as the frequent and unavailing efforts to relieve the bladder. The urine now dribbles or drops, and never flows in a full and unbroken stream. Each act of micturition is imperfect, and the bladder is never emptied. As constantly does that organ contract and endeavour to evacuate its contents. The "muscular coat" of the bladder gradually strengthens and thickens, in order to compensate, if possible, for the extra force now required to eject the urine through the strictured urethra; and as this

thickening proceeds, the capacity of the bladder is proportionably diminished, less urine can be retained, and micturition must therefore be more frequent. The bladder is irritable, owing to its diminished capacity (occasionally from other causes), and thus the pathology of stricture with vesical irritability is partly a hydraulic question. The reservoir of urine is drawn off perhaps more effectually as occasion may require during the watchful hours of day, and during that period the desire to pass water may therefore be less urgent and distressing; but, at night, when exhaustion would invite to rest, the sleepless irritability of the bladder repeatedly arouses the sufferer from his temporary doze. In vain he tries by every conceivable change of posture which instinctive feeling may suggest, to seek repose. His bladder still torments him, and the night is passed in restless efforts to obtain relief. The most easy position in such a case is the recumbent with the buttocks raised. By this

adjustment the urine is thrown back from the more sensitive portion of the bladder on to a part less acutely irritable.

Spasmodic stricture may occur at any portion of the urethra from contraction of the involuntary muscular fibres which encircle it throughout its course; or the membranous portion (of the urethra) may be constricted by spasmodic action of the compressor urethræ muscle, which acts as a sphincter on this portion of the passage. In such cases the urine is frequently very acid, and such acidity is the direct source of irritation. The indulgence over-night of acid wines, punch, food containing peppers of various kinds, or other stimulating condiments, may be followed next morning by an attack of spasmodic stricture, which (unlike the permanent stricture already noticed) is only of temporary duration, and after a while subsides; or a spasmodic attack may be superadded to, and aggravate, the results of permanent stricture. In either case the temporary spasm is frequently

due to irregularities of diet, and such as occur more especially among the affluent classes of society. Hence the constant association of a gouty condition with this form of stricture.

The restraints of society may almost compel an individual to postpone the act of micturition far beyond the time when desire is urgent, and this retention of urine, itself perhaps highly acid and irritating, will favour the occurrence of spasmodic stricture. The enjoyment of convivial life may thus end in much suffering and distress. Nor should the influence of outdoor amusements be forgotten. Rough riding on horseback (as, for instance, across a ploughed country) may so bruise the urethral passage as to induce spasmodic stricture. The experience of most surgeons will remind them of many instances of this kind—among those who go down for the hunting season, or those perhaps, who, being unaccustomed to horse exercise, are wont to attempt the sports of the field. Under these circumstances spasmodic stricture

may occur. But the picture may be reversed, and among the poor and the destitute who throng our hospitals this condition is of daily occurrence during the winter months. The combined effects of cold and exhaustion drive many a homeless wanderer to seek relief at an hospital during the early hours of our winter mornings.

Lastly, spasm of the urethra may be due to certain mental conditions which operate through the nervous system; and Sir A. Cooper notices in this respect the influence of anxiety and over-study as causes of stricture.

Inflammation of the urethral mucous membrane may occasion a species of temporary stricture. This condition may be the result of gonorrhœa when retrocedent, or suppressed by the use of injections, during the inflammatory stage; and this frequent cause of inflammatory stricture may be aided by the inconsiderate use of alcoholic liquors and a stimulating diet. In such cases I have observed the penis to be turgid and erectile, and the urethra

bleeds freely on the introduction of even a moderate-sized catheter. The urethra is acutely sensitive, and intense scalding is felt on passing water, which is shot out at short intervals from the now irritable bladder. In all these respects the symptoms of inflammatory stricture, so called, contrast with those produced by spasm.

The relief of stricture—whether organic, spasmodic, or inflammatory—will relieve the concomitant irritability of the bladder. The first-named variety of stricture yields most successfully to *gradual* dilatation; at the same time the instruments of Mr. T. H. Wakley will be found useful in certain cases of very tight stricture, through which "the director" having been introduced with, perhaps, considerable difficulty, we are then too happy to retain this guide to the bladder, rather than, by withdrawing the instrument, have again to encounter the obstacles and false passages which perchance first opposed its introduction. It is all very well to say that, if an urethra be

pervious, an instrument which has been passed once may be reintroduced; but that is not the question. The instrument has been passed with perhaps considerable difficulty, and the reintroduction of one of larger size may, therefore, be scarcely practicable. In such a case we may, I think, gladly avail ourselves of the advantage gained by Mr. Wakley's director and series of instruments.

In the event of spasmodic stricture, repeated attempts to introduce a catheter are unwarrantable. The spasm is more likely to yield under the influence of a warm bath coupled perhaps with a draught containing ten minims of Battley's sedative. I have used a drachm or more of the compound tincture of camphor with advantage. Chloroform, cautiously administered, has relaxed the spasm. I have not seen much good result from the use of suppositories. The beneficial effect of the warm bath and of antispasmodics is most obvious in cases of spasm after exposure to

cold; but should the gouty diathesis of the individual or the history of the case point to acidity of the urine, then the use of alkalies and other measures will at once suggest themselves. The inflammatory stricture (so called) which follows suppressed gonorrhœa will subside on the reappearance of the discharge, and I have often recommended the glans penis to be enclosed in a poultice, and have found this simple remedy successful.

DISEASES OF THE PROSTATE GLAND.

The prostate gland may become enlarged, and induce irritability of the bladder. The more common form of chronic Hypertrophy, unaccompanied by any obvious change of structure of the gland, is that to which I now refer. The commencement of this condition, so common in advanced life, is often very insidious. The prostate may have enlarged considerably without interfering with the act of micturition. Months, or perhaps years,

may elapse before any inconvenience arrests attention. At length some delay—not to say difficulty—in passing water is experienced. The desire to micturate is more frequent, if not painful. Pain is often felt in the glans penis; but this symptom (unlike the pain from stone in the bladder) is not more acute after micturition. But each act is felt to be incomplete and is unsatisfactory. A man may have long suffered from these symptoms, and if, when examined, the finger be passed up the bowel, his enlarged prostate will be readily detected, and by tilting upwards and forwards the base of the bladder, more urine may be expelled. Pathology supplies the true explanation of all these symptoms. The enlarged prostate projects upwards into the bladder (sometimes backwards towards the rectum), and urine accumulates behind the prostate. The bladder is never emptied below the level of the prostate. If, therefore, the lower fundus of the bladder be tilted forward by the finger,

or by altered posture, and a catheter introduced, a pint or more of urine may be drawn off from a reservoir which had apparently been drained. Then the bladder gradually fills again; but not until the urine rises above the level of the prostate, can the act of micturition occur. The surplus "*overflow*" then passes off, when the bladder is sufficiently distended to obey its own contraction, and the straining compression of the abdominal muscles to overcome the resistance offered by the enlarged prostate.

The progress and closing scene of this disease are similar to the history of retention from stricture. The muscular coat of the bladder thickens and projects inwardly, in the form of large muscular bands, between which the mucous membrane protrudes externally, and becomes sacculated under the constant pressure of urine. Congestion of the mucous membrane ensues, its colour changes to a greyish slate hue, and blood, viscid mucus, or purulent matter, is voided with the urine,

which is now alkaline and fœtid. The backward pressure of urine distends, and eventually dilates, the ureters; while the substance of the kidneys becomes atrophied; and suppressed secretion of urine, retention of urea in the blood, coma and death, terminate the patient's sufferings. But little can be done to cure—much to alleviate—the symptoms of enlarged prostate. The hydraulic results, as I would term them, of this disease, and concomitant vesical irritability, may be relieved by drawing off the urine, as occasion may require. The *prostatic* catheter should be full-sized, longer and more curved than the ordinary catheter; for these peculiarities of construction are necessary to adapt that instrument to the alteration of the urethra in respect to its length and direction, produced by the enlarged prostate; but the prostatic catheter usually sold in the shops is, I think, rather a caricature of what is required. If the patient be taught to introduce a catheter somewhat longer and more

curved than the instrument used for ordinary stricture, he may live on for some years in comparative ease and comfort. The medicinal treatment which will aid this happy quietude, I shall notice in connexion with inflammation of the bladder. The efficiency of such treatment will depend on the stage of the disease. When structural changes of the bladder and kidneys have ensued, the beneficial operation of all medicinal agents will obviously be impaired. No mode of treatment at present known can repair the structural degeneration of the kidneys; nor can hypertrophy (overgrowth) of the bladder be reduced. This leads me to make a few remarks on the latter condition.

DISEASES OF THE BLADDER.

Overgrowth of the bladder may be the result of an enlarged prostate, of stricture, or indeed, of any condition which induces habitual retention of urine, or by interfering with its free evacuation as occasion may re-

quire, overtaxes the contractile power of the bladder. Its muscular coat is, therefore, the portion chiefly affected, and eventually becomes hypertrophied—a change which any other muscular tissue would undergo by habitual over-exercise. No other structural change may accompany this condition; but the bladder is over-irritable, owing to its diminished capacity, and cannot, therefore, retain its contents for the average period. Micturition is more frequent. This functional activity should be distinguished from incontinence—a failure of function—due either to organic disease, or to malformation of the bladder, and a condition in which the urine dribbles away continuously, and is not shot out at short intervals, as from the bladder when irritable. I have already noticed the distinction between "overflow" and complete retention of urine. The former term is proposed by Mr. H. Thompson (in his elaborate treatise on the enlarged prostate), to denote the *regorgement* of French

authors, and indicates partial retention. It is of great practical importance to bear in mind the pathological distinction between, and significance of, these various morbid conditions—retention of urine, occasional overflow, dribbling incontinence, and frequent micturition from vesical irritability.

The latter perversion of function has been traced in the foregoing pages to the influence of certain constitutional causes, which operate either through the medium of the blood's circulation, or through the nervous system; and also to many varieties of local disease which occur in the neighbourhood of the bladder; but *organic* diseases of the bladder itself are, moreover, occasional causes of irritability. Certain supplemental growths, whether benign or malignant, may invade the proper structure of the bladder and occasion irritability. Cancer, generally the soft variety, may thus excite more frequent and painful micturition. The pain, at first endurable, and referred to the

loins, hips, or lower part of the belly, increases in severity, but is scarcely ever lancinating. The urine is ejected, perhaps, every few minutes, and as ulceration of the bladder ensues, is expelled with sweating agony. The semen may be emitted, and the contents of the bowels evacuated, or the bowel itself protruded, during this writhing effort to strain off the last few drops of urine. Profuse hæmorrhage often accompanies or follows the act of micturition; or the urine may be bloody, alkaline, fœtid, and purulent, and cancer-cells may be seen under the microscope. All these suspicious symptoms are corroborated by the discovery of a solid tumour at the lower part of the abdomen; but is such tumour malignant or benign? Constitutional symptoms cannot, I think, decide this question; for although the general health may break down under sleepless suffering, yet the peculiar *cachexia* of cancer is rarely present, even at an advanced stage of this disease, when affecting

the bladder. The microscope and the general severity of the bladder symptoms may, perhaps, determine our diagnosis. Very little can be done in the way of curative treatment; but the tormenting irritability may be somewhat allayed by measures which will be more conveniently noticed in the sequel.

No less frequent and intolerable is the desire to void urine, which announces the presence of stone in the bladder. The vesical irritability and straining effort are most painful *after* each oft-recurring act of micturition; for as the urine runs off, the stone is floated down and settles on the more sensitive neck of the bladder. The least movement of the body is now communicated to the stone, which rolls about with every change of posture. Personal experience soon restrains the patient's movements. He walks about stealthily, and shuns any sudden or violent exertion. Ask him to ride on horseback, or to jump off a chair, and he at once refuses. He feels more acute pain

in the glans penis than elsewhere, and this is aggravated *after* each act of micturition. At that time, or after rough exercise, the urine is more or less bloody from attrition of the stone and interior of the bladder, and the stream of urine may flow freely (unlike its passage through a strictured urethra), but cease abruptly, should the stone be washed down suddenly on to the neck of the bladder. All these symptoms of stone are directly due to its mechanical action; and should a calculus not be freely moveable, but encysted in the coats of the bladder, we may look in vain for any ordinary symptoms of its presence. In this, and all other cases of suspected stone in the bladder, we must, I need scarcely say, trust the less doubtful evidence of *sounding*, to detect the cause of vesical irritability. This touchstone is conclusive, when available. The physical signs of a hard body, such as a stone, and which may be transmitted through a metallic instrument to the hand and ear, are

far more conclusive than all the mere functional symptoms of its presence. All the symptoms of stone may be absent, as in cases of encysted calculus; or the symptoms, including evidence derived from sounding, may be masked by enlargement of the prostate. I remember to have heard from the late Mr. Thomas Morton (surgeon to the University College Hospital) of a case which occurred in his practice, and in which an instrument had been constantly passed by many eminent surgeons during a period of fifteen years, and yet no stone was discovered until after death. The pain and increased vesical irritability may be characteristic, but these symptoms are occasionally absent. Sir Benjamin Brodie, I believe, first noticed the fact that stone in the bladder causes less pain when the prostate is enlarged than when of its average size; and the comparative ease in such a case is probably owing to the enlarged prostate protecting the

more sensitive neck of the bladder from the weight and friction of the stone.

Other diseases may produce symptoms of vesical calculus. A pedunculated growth in the bladder may, during micturition, flap over the urethral orifice and abruptly arrest the flow of urine. Hæmorrhage may indicate ulceration of the prostate, or malignant disease of the bladder. Lastly, the pain and vesical irritability of stone may be due to either testicle being impacted and inflamed within the inguinal canal.*

We should not therefore be misled by the presence of any one symptom of a given morbid condition, but be guided rather by an *association* of symptoms to determine our diagnosis. Irritability of the urinary bladder is one result of many causes, and with the view to their discovery and removal, I have endea-

* See "Lectures on the Principles and Practice of Surgery." By Bransby B. Cooper, F.R.S.

voured to sketch an outline of the various diseases with which that condition may be associated; and in conformity with this design I would now review the history of another local disease, a prominent symptom of which is vesical irritability.

Inflammation of the bladder is a somewhat rare occurrence, but may be the sequel of suppressed gonorrhœa and metastasis. The symptoms of this condition somewhat resemble those of vesical irritability. The painful and oft-recurring desire to drain the last drop of urine, and straining effort to do so even when the bladder is empty, are symptomatic of irritability; but, the pain on pressure over the hypogastrium and the character of the urine, now loaded with mucus, pus, and phosphates, proclaim the presence of an inflamed mucous membrane. Retrocedent gonorrhœa may occasion these symptoms; but certain other diseases already noticed, such as stricture, enlargement of the prostate and stone in the bladder,

induce a more chronic form of inflammation.

The treatment of gonorrhœa becomes a question of considerable interest and practical importance when viewed as a cause of stricture and occasionally of cystitis. If the discharge be too suddenly suppressed by injudicious treatment, either or both of these untoward results may ensue: and as it falls to my lot to manage very many cases of gonorrhœa, I may mention that I almost invariably prescribe with success, a gentle aperient and alkaline mixture containing senna, sulphate of magnesia, and the sequi-carbonates of soda and ammonia. The urine is thus neutralized and rendered less irritating to the inflamed urethra; while the inflammation itself is gradually reduced by the hydragogue operation of the aperient. If this simple mode of treatment be persisted in for about three weeks and aided by abstinence from wine, beer, spirits, and a stimulating diet, the inflammation will most

probably have *safely* subsided. The discharge is no longer copious, thick, and sulphur coloured, but scanty, thin and transparent. This *gleet* may now be (safely) suppressed by using an injection twice a day, consisting of about two drachms of the liquor plumbi diacetatis to two ounces of water. I do not find it necessary to prescribe copaiba or cubebs ; and I have seen the worst results from an injection containing the sulphate of zinc.

Should *acute inflammation* of the bladder supervene from this or any other cause, then the *recumbent position* should at once be adopted. By this posture, the bladder is relieved of the whole weight of the upward column of blood. The bowels should be kept free to prevent irritation, and to derive from the bladder. Glisters of opium may do something to allay the distressing irritability. If the urine is acid, and its sediment yellowish and not coherent but purulent, Sir B. Brodie

recommends a pill of calomel (two grains), with half a grain of opium, to be taken twice or three times a day. On the other hand, should the urine be alkaline and present a small quantity of brownish adhesive mucus, then the same authority recommends fifteen minims of the vinum colchici, to be administered thrice daily, for three or four successive days.

Chronic inflammation of the bladder is denoted—when idiopathic—by an abundance of thick, tenacious, greyish mucus in the urine, which gradually subsides to the bottom of the vessel in which it is collected. This deposit may be tinged with blood, or present white streaks of phosphate of lime; and, as the viscid mucus increases in quantity to, perhaps, nearly equal the bulk of urine, it may be poured from its receptacle, in long coils, something like maccaroni. The urine itself becomes brownish, very ammoniacal, and fœtid—shiverings and great prostration may close the scene. The appearance of the bladder and

ureters after death corresponds to that already mentioned as resulting from chronic stricture —prostatic enlargement—and stone in the bladder. Can aught be done to anticipate the fatal issue of this disease—to arrest the muco-purulent discharge from the bladder, and to allay its irritability? The recumbent posture is still of cardinal importance. The general treatment recommended for acute inflammation is also appropriate; but Sir B. Brodie lays so much stress on the remedial value of a concentrated mixture of the pareira brava, that I am induced to extract his recipe for that preparation:—"Take half-an-ounce of the root; add three pints of water, simmer gently near the fire down to one pint." From eight to twelve ounces of this decoction should be taken daily. If the extract of pareira is preferred, then thirty grains of it are equal to half-a-pint of the above decoction. The decoction of uva ursi, or the infusion of buchu may aid in checking the muco-purulent secretion; but the

mineral acids, coupled with pareira brava, will do so more effectually. The nitric or muriatic acids are, I think, peculiarly serviceable; but more so when the urine itself is alkaline, rather than when it subsequently becomes so by admixture with alkaline mucus in the bladder. This latter opinion of Sir B. Brodie is confirmed by the observation of Dr. Owen Rees.* Benzoic acid also renders alkaline urine, acid.

I have found *gallic acid* useful in arresting the secretion of ropy mucus. And, when all acute symptoms have subsided, injections of tepid water, or decoction of poppies, in quantities of not more than two ounces, and retained for half a minute once a day, are recommended by Sir B. Brodie, who also speaks favourably of the diluted nitric acid, in the proportion of ten minims, *gradually* increased to twenty, in two ounces of water, used as an injection. By

* See an original communication by Dr. Owen Rees on Alkaline Urine, in Guy's Hospital Reports, 3rd Series, vol. i. 1855.

these measures, coupled with tonics and a generous diet, to support the dread exhaustion of chronic cystitis, we may succeed in arresting the progress of this disease to a fatal termination.

The foregoing appropriate treatment of cystitis should, of course, be coupled with the removal, if possible, of any local cause or predisposing constitutional condition with which that disease may be associated. Is inflammation of the bladder due to the friction and irritation of a calculus? Is, in fact, cystitis a symptom of stone in the bladder? Then that condition of inflammation can only subside on the removal of the stone as an exciting cause. Lithotomy or lithotrity is indicated. Does cystitis supervene on suppressed gonorrhœa—the restoration of the discharge is a rational principle of treatment. If the urine be turbid, with a brick-dust deposit of lithates, in conjunction, perhaps, with habitual irritable dyspepsia and a gouty constitution, then the

correction, if possible, of that constitutional tendency is clearly indicated.

In fine, the urinary bladder has its *nervous* and *vascular* relations to surrounding organs, and to parts distant in the body. The bladder is, therefore, encompassed by many contingent local diseases, which cluster around, and operate as disturbing causes of its own condition of health—whether functional, or, perhaps, structural; and, moreover, the influence of many constitutional diseases is manifested by, if not concentrated in, the urinary bladder. These conditions operate either through the agency of the nervous system—itself, perhaps, functionally disturbed, as illustrated by the phenomena of hysteria—or the organs of digestion may so imperfectly elaborate the food, and the process of secondary assimilation be, moreover, so incomplete, as to poison the blood with various evil constituents, and affect the bladder through various morbid conditions of the urine—the lithic acid, and red-sand deposit of lithate of

ammonia, being the more common results of mal-assimilation. I have therefore deemed it consistent with the design of this monograph, to review the symptoms and appropriate treatment of those local diseases, as well as constitutional conditions, which conspire to excite the painful and frequent desire to micturate, significant of irritability of the urinary bladder.

It remains for me to add certain practical remarks, which could not hitherto have been so conveniently introduced, on the curative treatment of this troublesome affection.

PART III.

IRRITABILITY OF THE BLADDER, AND ITS CURATIVE TREATMENT.

The rational remedial treatment of any disease must embrace the method of removing its causes, should they chance to be in operation. For this reason, having made a running commentary on the removal of those local diseases which induce vesical irritability, I would now complete our consideration of its curative treatment, by offering certain practical suggestions respecting the removal of its constitutional causes.

Hysteria.—The medicinal treatment of a constitutional disease so protean as hysteria must necessarily vary with the circumstances under which it arises. If my theory of the unity of the nervous force be correct, and that

the *undue local* manifestations of that force, whether as uterine excitement, nervous palpitation of the heart, or other varieties of nervous functional disturbance, are grouped together under the inapt and inexpressive term, hysteria, then, I say, the rational remedial treatment of that disease is fulfilled, by our endeavour to restore the balance of the nervous force, through searching out those habits which, frequently arising from the social condition of the individual, operate as causes of hysteria. The moral and intellectual condition of an individual in relation to the general course of his, or her, daily life, cannot be regulated by medicine. No medicinal treatment can reform the ill-regulated habits which are apt to induce the hysterical diathesis. Its evil orgin lies deeper in the depths of a vicious social education, and in that listless apathy and mental fallowness which are engendered by the want of some definite pursuit, some object, in life.

The revulsion and reaction—or nervous excitement of hysteria—is frequently associated with general debility and muscular irritability, especially of the urinary bladder; and under these circumstances, I have repeatedly observed the beneficial operation of the compound spirit of sulphuric ether and of other anti-spasmodics having an allied chemical composition, which I have prescribed with bark. In the case of a married woman, lately admitted, under my care, to the Royal Free Hospital, an uncontrollable desire to micturate occurred every few minutes; but this vesical irritability subsided under the above treatment, and when she left the hospital, she could retain her urine for the average period. I believe the class of anti-spasmodics to which sulphuric ether belongs, to be more useful in subduing hysterical irritability of the bladder, than any other of the anti-spasmodics. At the same time we should not overlook the advantage to be derived sometimes from preparations of valerian and assafœ-

tida; the latter especially, when used as an enema; or again, sometimes the nitrate of silver, sometimes the sulphate of zinc, sometimes the preparations of iron, or copper, prove useful. Should we fail with any one of these remedies, we may succeed with another: and, indeed, hysteria more frequently yields under a succession of remedial agents, coupled with what I would term *social* treatment.

Various morbid conditions of the urine —themselves products of mal-assimilation of the food—are no less prolific causes of vesical irritability than are perturbations of the nervous system. The urinary bladder can well tolerate its healthy constituents, which only sufficiently irritate that organ to suggest, from time to time, the evacuation of its contents. But, if one or other of the constituents of healthy urine be in excess, or some new compound present itself, the bladder at once rejects the unaccustomed urine.

If the urine be scanty, and of a bright-red colour, although not turbid, it will probably abound in lithic acid, which may be readily detected under the microscope by its rhomboidal crystals, and by the over-acid reaction which reddens litmus-paper; or the urine may become turbid on cooling, and throw down a brickdust deposit of lithate of ammonia, amorphous when viewed under the microscope; unlike oxalate of lime, which presents beautiful octahedral and dumb-bell crystals; and further, the brickdust lithates disappear when heated in a test-tube, or on pouring hot water into the chamber utensil, a ready method of testing the presence of lithates. I need scarcely add that the pale muddy alkaline urine containing phosphates—whether the triangular crystals of the triple phosphate, of ammonia and magnesia, with lime—or the amorphous phosphate of lime—does not clarify when heated, but on adding a few drops of nitric acid, which coagulates albumen if present, from which

phosphatic urine may be thus readily distinguished.

Lithic acid, whether free, or combined with ammonia, is a product of that decay and decomposition which the albuminoid textures, chiefly muscles, are continually undergoing in common with all other tissues in the animal economy; but these products when in excess may, together with oxalate of lime, also be due to some chemical error in the process of constructing the albuminoid tissues (*i.e.*, due to mal-assimilation), as well as the result of their destruction; and this mal-assimilation of food is frequently induced by its imperfect elaboration in the previous process of digestion. Hence, the frequent association of dyspepsia with the lithic acid diathesis; and the importance of distinguishing between this constitutional cause of lithic acid urine, with vesical irritability, and its association with the mal-assimilation of food in the process of nutrition. Either source of

lithic acid, of lithate of ammonia, and of oxalate of lime, must be detected and discriminated, ere we can reasonably hope to remove these constitutional causes of the irritable bladder.

The urine secreted at from three to six hours after a meal presents the products of digestion; while that secreted several hours subsequently, when the urine of digestion has run off, presents the products of secondary assimilation, or the *débris* of the textures. This latter may be called *urine of the blood*, and if examined in the morning, before breakfast, and after an interval of fasting from over-night, will be found to contain, unlike the *urine of digestion*, the waste of the textures. To make this observation complete, the bladder should be emptied over-night, to prevent any admixture of the urine then in the bladder with that which is secreted during the night.

By this simple observance, these two sources

of lithic acid in the urine may be detected and distinguished.

Should excess of lithic acid be a product of textural decomposition, we cannot well regulate its continual production; but if a product of dyspepsia, its formation may be controlled by reducing the proportion of *animal* food. The vesical irritability which so frequently torments the victims of gout may be allayed, by abstaining from that general habit of diet known as free living. A well-selected and moderate diet, coupled with sufficient bodily exercise to throw off the food taken, will do as much as, and, perhaps more than, medical treatment to subdue a gouty tendency. The pithy advice of Abernethy has never been surpassed, "Live upon sixpence a day, and earn it." This maxim may prevent an attack of gout, but when the blood is already surcharged with lithic acid, its elimination by the kidneys may be aided by diuretics, of which, colchicum is, I think, most effectual. The wine of colchi-

cum, given in doses of ten minims and upwards three times a day, combined with the carbonate of potass to neutralize the urine, and aided by a plentiful supply of diluents; will carry off the lithic acid, and soothe that irritability of the bladder which accompanies its discharge. Saline aperients will contribute to this desirable result.

The excessive development of grape sugar in the blood is soon made known by its diuretic properties—by the prodigious quantity of saccharine urine secreted—by the parching thirst, voracious appetite, dry rough skin, emaciation, and other symptoms of diabetes mellitus. The chemical pathology of this disease is obscure. The liver is perhaps the sugar-factory, at least the experiments of Bernard point in this direction; or perhaps the gelatinous tissues may in the process of their decay generate sugar; but whatever theory of sugar-formation we adopt, certain it is that the development of sugar is most effectually checked

by a judicious diet. The scrupulous avoidance of those articles of food besides sugar, such as starch (potatoes), which are susceptible of being converted into sugar, will do much to prevent and cure this variety of diabetes. Hence the common experience of every practical physician, that a diet of meat, bran-bread, green vegetables, as cabbage, with weak brandy and water, and cream rather than milk, is singularly useful. Under this system, the urine may diminish in quantity from a bucket-full in the four-and-twenty hours, to nearly the average amount. Moderate exercise, such as the strength permits, will aid this result by increasing the respiratory function, and thus burning off the sugar which (according to Bernard) disappears from the blood during its transit through the lungs.

The intolerably frequent micturition may be relieved by astringents (opium being, I think, the best), which check the diuretic action of sugar; while the well-known use of phos-

phate of soda, and the carbonates of ammonia and magnesia, may perhaps be explained by their counteracting the acidity which abounds in saccharine diabetes.

The more rare form of diabetes, in which *urea* is unduly developed during the decay of the azotized textures, is associated with, if not produced by, general depression of the vital power of assimilation, resulting from great mental exertion, anxiety, sleeplessness, with perhaps daily toil, and starvation. The system should therefore be repaired by a generous diet, aided by tonics and alcoholic stimulants, which latter would seem to supply a material that readily oxidates, and thereby protects the muscular tissues from premature decay, and that inordinate production of urea which rapidly runs off by the kidneys and incessantly irritates the bladder. The quantity of the urine, and, therefore, the frequency of micturition, may be reduced by opium, which tends moreover to soothe the general nervous

excitement which accompanies exhaustion of mind and body.

Here I would bring to a close the sketch which I have attempted in the foregoing pages of a morbid condition, depicted in the ready language suggested by my own observations and reflections, rather than by the more formal, although perhaps finished description of a compilation. I am aware that this monograph is incomplete, but if suggestive, I shall regret its imperfection the less. Moreover, the details of personal observation are not readily recorded; for that with which we are most familiar, is apt to be overlooked, and, indeed, I am inclined to believe, that the better portion of every man's experience, dies with him.

THE END.

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