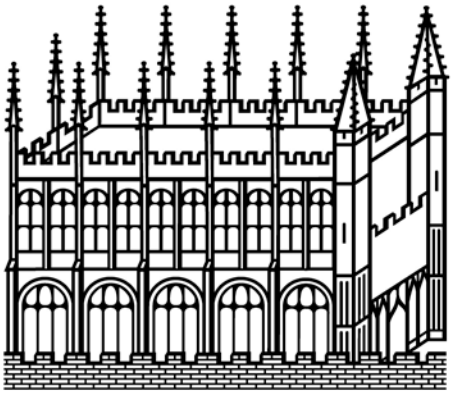
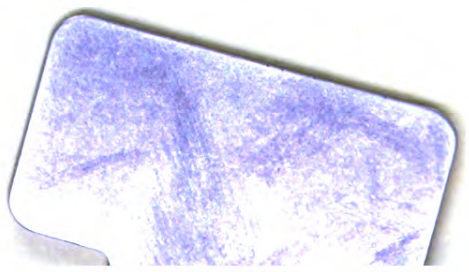


MORBID STATES
OF
THE URINE



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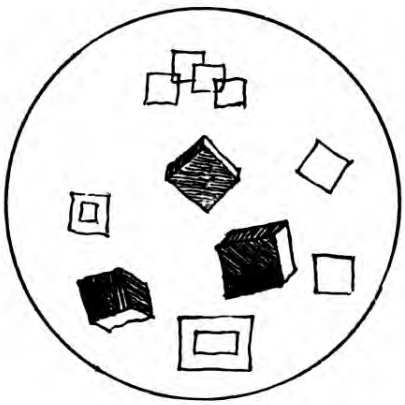

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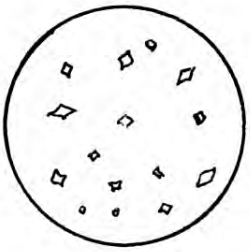

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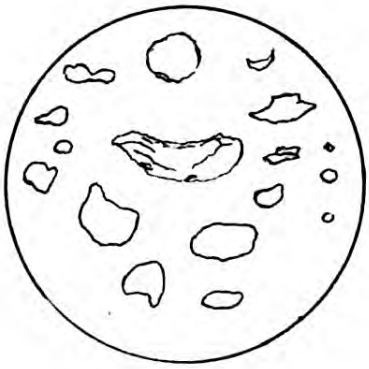

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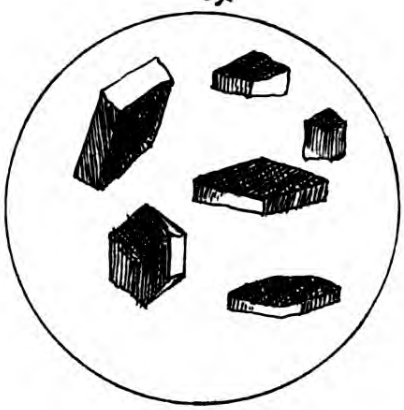

TREATISE

ON

MORBID STATES OF THE URINE,

WITH THE CHEMICAL AND OTHER MEANS OF

DIAGNOSIS;

TOGETHER WITH SOME GENERAL REMARKS ON

URINARY DISEASES;

ILLUSTRATED BY SEVERAL CASES.

BEING

THE INAUGURAL DISSERTATION FOR THE DEGREE OF
DOCTOR OF MEDICINE AND SURGERY IN THE
UNIVERSITY OF Mc GILL COLLEGE.

BY

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PREFACE.

It is generally a matter of difficulty for Students of all Universities to choose a subject whereupon to write a Thesis; and when chosen, it matters little to many of them whether they understand it, so long as the desired object is attained, that of fulfilling a necessary regulation attached to the completion of their studies at the University in which it may be their fortune to matriculate.

In my own case, I have chosen one extremely difficult, but one which has engaged my most earnest attention during the period of my studies, and a subject that will also obtain particular consideration with me in later years, perhaps in preference to some other class of diseases.

I have endeavoured to be as brief as possible throughout; many of my remarks I have founded from actual observation; I have added condensed notes of six cases taken in the Montreal General Hospital, as illustrations of some of the diseases belonging to the class upon which I am treating, and if in *error* in my opinions and obser-

vations upon some of them, I candidly claim the indulgence of the Professors of the University before whom this may come, trusting they will remember that this Thesis is not written by one of long experience, but one nevertheless, who has the study of his Profession sincerely at heart.

Dorchester Street, Montreal.
January, 1846.

TREATISE,

ETC.

Of late years diseases of the Urinary Organs have begun to excite considerable attention, and many deservedly popular works have been written on the subject, and certainly, there is no class of diseases to which the human frame is liable, requiring more patient consideration at the hands of the practitioner.

The diagnosis of some of these diseases is extremely difficult, but with the assistance of our chemical knowledge aided by the microscope, we may *now* more safely venture in forming a correct idea of a disease than formerly; many have appeared to suffer from affections as Phthisis, Morbus Cordis, and others, when such diseases did not actually exist, the symptoms depending upon an abnormal state of the urine, the result of morbid action in the general system.

In dwelling upon this subject it becomes necessary to state what organs of the body become affected, and to offer a few remarks on the causes thereof, together with the alterations in the urinary secretion.

In the first place, those organs may become diseased which are the direct agents by means of which the urine

is separated from the blood, namely the *Kidnies*, from either an excessive or a defective action, or from the effect of mechanical irritants acting directly upon them, as acrid diuretics, calculi or gravel existing in and producing inflammation and its consequences, or even external injuries, as blows in the loins, &c.: Dr. Prout considers the abuse of mercury as one of the great sources of this class of diseases.

The excessive action may be attributed to either the unhealthy nature of the secretion, which the blood is depurated of, or to an excess of the abnormal products existing in the blood, which is forced out by the kidnies, they becoming afterwards diseased as a consequence.

Under this might be considered the following diseases as causing excessive action, although they are classed as functional diseases by Dr. Prout :—

Diabetes, often resulting in Hypertrophy,

Albuminuria, producing granular disease and sometimes mottled kidney?

Again, a defective action *may result* in

Atrophy of these organs,

Ischuria Renalis,

Renal Calculi and Gravel;

besides which, excess of urea; uric acid and combinations; uric oxide; oxalic acid; the earthy salts; purpurine; cystine; and many other products are formed, with formation of urinary calculi and deposits.

The defective action may be the result also of former excessive action caused by over stimulus from food or even intoxicating liquors, all of which tend more or less to urge the functions of the kidnies to the utmost.

Inflammation with haematuria may exist, with pus

and mucus either singly or combined in the urine, the result of mechanical irritation, cold, previous disease, &c.

The mucus would arise from the inflammation of the lining of the pelvis and infundibula of the kidnies,—termed by M. Rayer, Pyelitis.

The pus from abscess in the kidney, known by the dull pain in the loins with repeated shivering, following the symptoms of Nephritis.

Besides what has been already mentioned, the kidnies become diseased when other important organs of the body are primarily affected, as well as from the morbid alteration of the sanguineous fluid, wherein exists those products of unhealthy secretion so often terminating in incurable disease.

The *Ureters*, the canals by which the urine passes from the kidnies to the bladder, are seldom or never diseased unless consecutively, when inflammation may exist from the passage of a calculus or as an accompaniment to already existing inflammation in the kidnies, hæmaturia co-exists also. When a calculus remains impacted in the ureter, its pelvis, together with the walls of the kidney, become ultimately extended from the large accumulation of urine; the kidney in this manner may be transformed into a kind of sac which may fill the abdomen, containing a variable quantity of urine: a case of this kind was treated in St. John's Hospital, which was supposed to be ascites, tapping was performed, but death took place, and on the autopsy the enlarged kidney nearly filled the abdomen.*

The *Bladder*, the receptacle for the urine, would re-

* Druitt's Surgery.

quire more consideration than I am at present willing to give—its diseases are:

Cystitis, Inflammation of, either chronic or acute, producing suppuration, ulceration, hæmaturia, &c. The chronic form may depend upon fungus or ulceration of the organ, stricture at its neck, disease of the prostate gland, ureters, or kidnies; it is in this form that a large quantity of pus and mucus is poured out.

Enuresis or Incontinence of urine, arising from mechanical causes or from functional derangements of the bladder.

Dysuria, difficulty in voiding urine, produced by a variety of causes.

Ischuria Vesicalis, suppression of urine.

Here also might be considered the different *Urinary Calculi,* a class of products in themselves particularly interesting, as well to the Chemist as to the Pathologist.

The last organ here worthy of mention is the *Prostate Gland,* often the seat of Hæmaturia caused by the rude introduction of instruments, or by the irritation of stone, resulting in acute inflammation, which is generally however a consequence of acute gonorrhœa.

Abscess of the prostate is often the result of Inflammation.

Chronic enlargement is extremely frequent in advanced life, and seems to depend on the decay of age rather than on any disease.

Complete retention of urine does exist from enlargement of the prostate.

Calculi of the prostate are small reddish brown concretions of phosphate lime formed in the ducts of the gland.

Scirrhus of the prostate is of very rare occurrence.

Dr. Prout in his work on stomach and urinary diseases has divided them into two great classes, functional and mechanical diseases.

The *former* comprehending the description and treatment of diseases arising from derangement of the assimilating and secreting organs.

The four groups of alimentary proximate principles are considered in this division, and under each group are classed those diseases in which the urine contains the various substances either separated, changed, or decomposed, which originally formed the particular compound aliment treated under one of the groups ; I may cite for example as being treated in chap. I. book I., General Observations on the Pathology of Saccharine Assimilation and Secretion.

Diabetes—oxalic acid diathesis—lactic acid.

In the first, sugar exists in a natural state,

In the two last, it is decomposed.

The *latter* division comprehends the description and treatment of diseases arising from obvious lesions of the kidney and bladder, and from the presence of foreign bodies in these organs.

The origin and increase of various calculi are here considered.

I have deemed it necessary to give this division of Prout's, as this Thesis would have been incomplete without it.

The derangements occurring in the stomach are so intimately connected with urinary diseases, particularly those where various deposits occur, that it would also be unfair to omit giving the " Phenomena of Assimilation and Secretion" by Prout, which are *not only* important in

reference to stomach and urinary diseases, but truly valuable in the consideration of disease generally; in reading his work (Prout's) I experienced more pleasure and gained more knowledge from his Introduction, where this subject is considered, than many an hour's study on a less difficult subject; and as the subject is there treated at considerable length, I shall here give it in an abbreviated form :—

Prout's four great classes of Alimentary Proximate Principles are denominated the aqueous, the saccharine, the albuminous, and the oleaginous.

The processes of assimilation, in the general sense in which the term is used, include every process directly or indirectly concerned in the assimilation of the alimentary matters above mentioned, into the textures of a living animal body. In this sense of the term, therefore, the processes of assimilation may be divided into two great classes, which, from their relations to each other, may be termed the *primary* and *secondary assimilating processes*. The *primary assimilating processes* comprise the process of digestion, and all the intermediate processes up to sanguification inclusive; while the *secondary assimilating processes* comprise the processes by which the different textures of which the living body consists, are first formed from the blood, and afterwards re-dissolved and removed from the system.

In the processes of assimilation, both primary and secondary, *water* plays a very important part.

The *primary assimilating processes* viewed as a whole, and with reference to the chemical influence of water, may be considered of two kinds, directly opposed to each other. From the stomach to the duodenum inclusive, the operations are all of a *reducing* kind; that is, the

alimentary matters, however strong and firm, are gradually reduced by this first stage of the assimilating processes to the *lowest* possible condition,—to the tender and delicate state, as it were, of infancy. In this low state, the alimentary principles enter the lacteals as chyle; and from this moment they again gradually begin to be *raised*, and to become stronger and firmer in their texture, till they reach the thoracic duct, when their properties are found to be considerably developed. From the thoracic duct they are poured into the general mass of blood, and immediately subjected to the action of the respiratory function in the lungs. During the respiratory process, they part with the remainder of their combined water, (which is principally expelled from the lungs with the respired air,) and thus, being rendered *complete* in their properties, and identical in all respects with the blood itself, they are finally adapted for incorporation with that important fluid.

If we attentively consider the reducing portion of the assimilating processes, we shall find them to be at least of three kinds. In other words, the digestive organs, properly so called, exert a threefold function. First, the stomach has the power of dissolving alimentary substances, or of bringing them into a semi-fluid condition. This operation seems to be altogether chemical, and, probably, essentially consists in the combination of alimentary substances with water; that is, in *reducing* the alimentary substances from a high to a low condition. Secondly, the digested aliments, or the chylous portion of the chyme, taken up by the lacteals, though the proportions of its different ingredients may vary, is always essentially the *same* in its composition. The digestive

organs, therefore, and more especially the stomach, must possess the power, within certain limits, of changing into one another the simple alimentary principle formerly described. This part of the operations of the stomach appears, like the reducing process, to be *chemical*, but not so easy of accomplishment. It may be termed the *converting* operation of the stomach. Thirdly, the crude and dead aliments undergo changes in the stomach, &c., which render them fit to be brought into contact and even in union with the *living* animal body; the stomach and assimilating organs, therefore, must possess the power of *organizing* and *vitalizing* the different alimentary substances. It is impossible to imagine that such organizing agency of the stomach can be chemical. This agency is *vital*, and its nature is completely unknown.

As the term *Secondary Assimilation* is novel in the sense in which it is employed, it may require a brief explanation.

We have already stated, that under the head of secondary assimilation we range all assimilating processes, subsequent to those of sanguification. The secondary assimilating processes, therefore, include two great divisions; which, for the sake of distinction, may be termed the *formative* and the *destructive*. Under the head of the secondary formative assimilating processes, are included the different processes by which the principles of the blood are converted into the different tissues composing animal bodies, as well as the different secretions designed for ulterior purposes in the economy: while under the head of secondary destructive assimilating processes, are included the extinction (secondary

digestion) of the different tissues of the body and their conversion, either into new principles designed for ulterior purposes, or into disorganized products designed to be removed from the body; or, more frequently, into products belonging to both these classes of substances.

These, then, are the phenomena of assimilation, so clearly and ably explained by Prout: it follows, upon a derangement of either the primary or secondary processes, that disease, or a liability, or predisposition to it, in some form, is the consequence; and, from a derangement of the first or primary assimilating processes, depending upon mal-assimilation of alimentary matters in the stomach, results particularly many urinary diseases, I use the term generally. It would be a matter of doubt with some, whether the secondary assimilating processes could be deranged, independantly of the primary, although it might be stated, that disorganization in some of the tissues of the body are dependant upon derangement of the primary assimilating processes, that might be very true in certain cases—the assimilating processes, primary and secondary, are certainly intimately connected, but still a derangement of the latter without the former is supposed to take place: for instance, where *too much food* is taken relatively to the constitution of an individual, *either* the primary or secondary assimilating processes, or both may suffer. In some instances, individuals in whom this takes place, suffer more especially from derangements of the secondary assimilating processes, as from hepatic congestion, gout, &c., particularly about the middle periods of life, when the consequences of excesses of all kinds begin to be manifested.

There is no doubt if in viewing disease at the bedside, we were to keep in mind the doctrine of assimilation, we would find probably many, or I may say numberless cases depending upon secondary derangements, some influenced by external agents; for instance, an ordinary case of rheumatism, the secondary assimilating processes have become deranged in a patient, whereby there is an immediate predisposition to disease, cold, however slight, is now an exciting cause, the muscular fibre is attacked, and the disease exists, the blood is of course altered in quality, and the *urine* contains abnormal secretions; this latter is merely a sign, but *urinary* signs are pathognomonic in some diseases: again, take a case of chronic dyspepsia, the cause of the disease here, derangement of both primary and secondary assimilating processes or a constant derangement of the primary only, producing irritability of the nervous system, which ultimately, even if the primary processes are repaired, affect the system secondarily, well in the worst forms of this disease, we have the secretion of *oxalic acid* in the urine, and this proves to us how far the disease has resisted our efforts, and to what a dangerous length it has proceeded, it is in this form that the deposition of tubercle begins. I remember a case of chronic dyspepsia occurring in the hospital, the beginning of last summer, the patient a retired soldier of the 23rd fusileers; during the winter he was suffering from constant dyspeptic symptoms which were at times alleviated by appropriate remedies, he complained of chest disease in the latter part of the winter, which proceeded slowly, but surely, and carried him off three months after. I had not then paid much attention to

this form of disease: but I feel satisfied if that man's urine had been chemically and microscopically examined, oxalic acid would have been discovered.

I might run on and cite many more instances where we would observe the immediate connection between assimilation and disease, and I think by far the greater number of the so-connected will claim relationship with, if not forming, themselves, urinary diseases.

I have now come to that part of my subject where it is necessary to treat upon the Chemical and other means of Diagnosis in urinary diseases from the appearance of the urine itself, giving those means now adopted for detecting abnormal products whereby we discriminate between one disease and another; those *important* signs from which we form our Diagnosis and Prognosis, as well as lay down our proper rules of treatment. I shall not dwell upon the whole of them, but will confine my observations to a few of the more important, those particularly which I have annexed cases to illustrate. I shall also make such remarks on the cases as may appear necessary in pursuing the subject: one object in annexing these cases is to show the manner in which I tested the fluids successively, and the method I employed in estimating the exact quantity of albumen existing in the urine; the detection of sugar in the fluid of dropsy; and the complication of sugar and albumen in the first stage of Bright's disease. The first case is long, but as it is the most important, I have not deemed it necessary to abridge the first part of it.

I shall first speak of *Albumen*.

The existence of albumen in the urine is a pathognomonic sign of Morbus Brightii when of low sp. gr.; it

exists in the urine of pregnancy; urine of dysentery; sometimes in Scarlatina, when a congested kidney occurs as an almost necessary result from the temporary suspension of the cutaneous function; and in cases of some pelvic tumour.*

It is possible that the presence of a small proportion of albumen is sometimes consistent with the healthy state of the secretion. Its presence in the urine in Bright's disease may be said to be owing to an affection, or properly speaking, granular degeneration of the kidnies, produced, in some cases, by derangement of the primary assimilating processes; while in others by cold and wet acting as direct causes. Many ascribe it to sitting down on a cold stone, or taking cold water while over heated, or getting wet during night watching, or even to blows upon the loins; uncleanliness is considered by Mr. Wakley, the Editor of the Lancet † as one great cause among the lower orders. Dr. Lever ‡ has found in nine cases out of ten of Puerperal Convulsions that the urine was albuminous. Mr. Ross, in his Clinical Contributions published in the 1st vol. of the Lancet for 1844, considers albuminuria a consequence of an arrest of the functions of the skin—a doctrine he had already published; his reasons for this conclusion were derived from observations of the fact of the urine being found uncoagulable, when the anasarca was trifling, and the skin in a freely perspiring state; but that when the skin was dry, and the anasarca mounted to the hips, coagulable urine would be certainly found, unless, at the same time, any one of

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* Dr. Bird. † Vol. 1, 1844. ‡ Lancet, vol. 2, 1844, p. 372.

the serous surfaces should commence a secretion of albuminous fluid, and by such means relieve the kidnies. If also, extensive anasarca should remain in *statu quo* for several days, or weeks, the urine during this time would be found albuminous; but if, as before, effusion into a serous cavity should take place during the previous twenty-four hours, the urine would cease to render a coagulum, which would again appear, upon an arrest of the functions of the secreting surface. Hence (he says) albuminuria did not alone depend upon the state of the kidnies as organically diseased, but also upon the state of the skin and serous surfaces.

These observations are important, and I was struck with their correctness upon paying particular attention to the cases I had taken, where on reference it will be invariably found throughout, that as the anasarca increased or diminished, so did the albumen exist in greater or minor quantity, and the perspirations frequent or not; and in case No. 2, one of the objects of the attending Physician was to promote free and unlimited perspiration, for the reason, he said, of its having been found by experiment that when perspiration was checked in animals the urine became albuminous, and on removing the cause of, it disappeared. I afterwards read a paragraph headed causes of albuminuria,* a memoir read before the Academy of Sciences, Paris, by Dr. Fourcault, where these experiments are noticed, to which I refer the reader.

The following are the means employed for detecting albumen:

Heat throws it down, as well as the phosphates, the latter however are soluble in nitric acid.

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* Vol. 1, Lancet for 1844.

Nitric acid throws down a dead white precipitate when albumen is in excess—so do the other mineral acids; it sometimes throws down a white precipitate when persons are taking copaiba, cubebs, and resins, this is not, however, produced by heat.

Ferrocyanide potassium when acetic acid is present, and sometimes without, is a most delicate test, detecting it when in small quantity; as also does

Bichloride Mercury, which is particularly important to bear in mind, from the reason of albumen being the antidote to poisoning by.

Creasote, alcohol, and *ether* coagulate it.

Alum and *acetate lead* precipitate it.

Tannin is a delicate test; if tinct. of galls is used, there is a double test, the albumen being partly thrown down by the tannin, and the alcohol remaining and coagulating some at the top; either it or the infusion may be used, whichever is readiest at hand.

Sulphate copper throws down a white floculent precipitate soluble in acetic acid; when the phosphates are present with albumen as in the *case of anasarca* annexed, where the fluid tested was from the abdomen, a compound is formed which I have called the albumino-phosphate of copper: on adding the sulph. copper in that case a *very thick* precipitate of a bluish pea green occurred which seemed to fill the whole vessel; on filtering this fluid and drying the precipitate, a peculiar substance was obtained of a hard nature, which on breaking had a vitreous appearance, with alternate layers of green of all shades; by subsequent analysis this substance from the nature of its constituents was proved to be the compound named. Synthetically, it may be prepared by adding a solution of phosphate of soda to a

solution of sulphate of copper in water, when a slight cloudiness is produced, if a solution of white of egg is now added, a thick gelatinous precipitate occurs of a pale pea green colour, in some instances it remains scattered through the liquid in the form of small cysts.

Under the *Microscope* albumen appears in the urine in the form of large organic globules, much resembling the mucous particle or globule, composed of a granular membrane investing a series of transparent nuclei which become visible on the addition of acetic acid. In some, two nuclei of a crescentic shape with their concavities opposed, are alone seen.

They occur in the greatest abundance in albuminuria, and have been seen in such quantity as to resemble diluted pus microscopically.*

The first *case* of Bright's disease will be found particularly interesting, for the notes were commenced in the first stage, and the patient (now in Hospital) is supposed to be in the third stage of the disease. A great deal of interest was excited when its first part was noted, from the circumstance of sugar being detected with albumen in the urine, and of its sudden disappearance afterwards, urea which was not present with the sugar, taking its place, and as my experiments were most satisfactory and conclusive, the sugar procured having been tasted and smelt by the attending physician and the students present, I hope the doubts of those, if there be any, as to the correctness of this case will be removed.†

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* Bird's Deposits.

† There were one or two persons absent when the sugar was examined, who doubted the fact of its being sugar.

Although no mention has been made by authors (I believe) on sugar existing in albuminous urine, I find it stated by Willis,* Christison,† Hooper,‡ Elliottson,§ and Prout,‖ that albumen exists occasionally in *saccharine* urine; and certainly from the difficulty in detecting *small* quantities of sugar in albuminous urine, it may have escaped notice.

On referring to the first part of this case, it will be found that some very remarkable changes in the character of the urine occurred within twenty-four hours from the exhibition of aromatic sulphuric acid, they are so important and singular that I consider it necessary to dwell upon them. In the notes of the case, when the patient's medicine was changed, on 6th March, 1845, from squill and digitalis to m. x. acid sulp. aromat. ter in die, I made an analysis of the urine voided on the morning of that day, and that voided on the afternoon of the next day (7th) when the following were the results:

6th March, previous to taking acid sulp. aromat.	7th March, 24 hours after taking the acid
grs.	grs.
4 oz. yielded of solid albumen 50½ =151½ grs. to lb. Troy.	4 oz. yielded of solid albumen 11 =33 grs. to lb. Troy.

A difference of 118½ grs. in the 24 hours.

The same evaporated to dryness (the albumen being separated) yielded 45 grs. residue, principally *Sugar*, with traces of Chlorides and Sulphates,=135 grs. to lb. Troy.	The same evaporated to dryness (the albumen being separated) yielded 69 grs. residue, principally *Urea*,=207 grs. to lb. Troy. ½ oz. urine by evaporating and saturating with Nitric Acid yielded 6¼ grs. of Nitrate of Urea.

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* Urinary Diseases. † Library Prac. Med., article Diabetes.

‡ Vade Mecum. § Pract. Physic. p. 708. ‖ Urinary Diseases.

Now if the total amount of solids of each are examined, it will be found that the urine

of 6th yielded 286½ grs. in the lb. of urine,	and of 7th 240 grs. in the lb. of urine,

showing a difference of 46½ grs. of solids. It will be seen further that these results will prove nearly the same as the amount of solids stated in Dr. Bird's work, relatively to the specific gravity of the urine; the urine of 6th sp. gr. 1.026 should yield according to said table 302.90 grs. in lb. Troy, which is a difference of 15 grs. above that obtained; and that of 7th sp. gr. 1.020 should yield, per same table, 233 grs., which is 7 grs. less than that obtained, so that allowing his table to be the average result of numbers of experiments, these of mine may be considered correct. The patients urine voided was increased also one pint within same period.

The *reasons* of this extraordinary change within twenty-four hours I must leave at present for wiser heads than my own to determine, I think it right however to suppose the possibility of a decomposition of the sugar, and conversion into urea; we know sugar to be composed

of	C	H	O	
	12	14	14	=198
and urea	C	H	N	O
	2	2	4	2=60

Now it would not require the decomposition of a large quantity of sugar to form urea, and although no nitrogen exists in sugar it does in albumen—the composition of which is

C	H	N	O	
48	36	6	14	(Liebig)

with indeterminate proportions of S & P.; and as the reduction in the quantity of albumen was very great,

may not the nitrogen of that albumen have gone to form the urea, which proved so abundant; the theories of the decomposition of bodies resulting in the formation of new compounds are all speculative, and this may be viewed as a temporary explanation for the disappearance of the sugar, and formation of the urea.

To show the variability of albumen in the urine in this case,

On 10th March,	1 lb.	yielded	46½ grs.	sp. gr.	1.040
16 ,,	1 ,,	,,	27 ,,	,,	1.028
11 May,	1 ,,	,,	19½ ,,	,,	1.012
11 June,	1 ,,	,,	87 ,,	,,	1.032
6 December,	1 ,,	,,	9 ,,	,,	1.010
1846,4 January,	1 ,,	,,	16½ ,,	,,	1.011

Whether the quantity of albumen existing was influenced by the amount of perspiration occcasionally present, I cannot say, as in this case, I had not paid any attention to that important enquiry.

In part first of case No. 2, Bright's disease, the quantity of albumen when first known to exist (on 11th June) was 103 grs. to lb. troy, sp. gr. 1.016; the sp. gr. of the urine in this case throughout, is averaged at 1,020, and the *quantity* of albumen varied considerably; on his leaving the hospital on 12th August, sp. gr. of urine was 1,023 and did not contain 10 grains to the lb. of albumen; this would prove in this case the benefit of free perspiration, for when the diaphoretic plan was commenced by Dr. Sewell, the rapid cure was very evident. In case No. 3, the disease was brought on by working up to the waist in water, the diaphoretic plan did not prove so successful here, as tapping had to be performed two weeks after its commencement, still the albumen *decreased* in the urine from the perspirations.

I shall turn my attention now to *Sugar*, which exists largely in the urine of *Diabetes*.

There are many valuable ways for discovering it :—

1st. Its presence may often be discovered by its sweet taste in the urine, but it must not be relied on, for sometimes it has not a sweet taste although one half of its solids consist of sugar.

2nd. Yeast is a most delicate test, from its fermenting with sugar, this does not occur in healthy urine ; if sugar is present, and the temperature raised to 80°, effervescence occurs, a brisk discharge of gas takes place, and at length a yellowish fluid is formed, with the odour of beer, and will yield an alcoholic liquid by distillation.

3rd. The formation of oxalic acid by the addition of nitric acid aided by heat.

4th. Evaporation, when a thick syrup of a honey-like odour, or I may say of maple sugar, which under protracted heat dries into a substance like barley sugar—by a particular process crystals may be obtained.*

5th. Trommer's test, see case of anasarca annexed for its details.

6th. Capezzuoli's test, see same case for details.

7th. Moore's test : place in a test tube ʒij of suspected urine and add nearly half its bulk of liquor potassæ. Heat the whole over a spirit lamp and allow actual ebullition for a minute or two ; the previously pale urine will become of an orange brown or even bistre tint, according to the proportion of sugar present.

8th. Liebig's test : if urine contains sugar, simply add to it some common cheese, well cleansed from foreign

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* Lib. Prac. Med., vol. iv, Article Diabetes.

matter; let it stand for some hours, and add acetate of zinc or magnesia: if sugar be present in the urine, a white precipitate will be thrown down; it is, however, nearly certain that a portion of the sugar will have previously been converted into *lactic acid*; in this case the mere addition of acetate of zinc will detect it; Mr. Ross says this appears to be a more accurate and simple means than that proposed by Trommer of Berlin.*

In some works, as Dr. Bird's for instance, only the 5th, 6th, and 7th tests are given, and it would appear as if the other tests are valueless; I have experimented with the whole except Liebigs', and I must say I did not always succeed with those three mentioned, notwithstanding I had put a large quantity of sugar in some urine for the purpose.

It will be seen on referring to the case of anasarca, that I succeeded well with two of the tests, but with Moore's, although considered the most accurate by Dr. Bird, I entirely failed. Had I known of these latter tests when examining the saccharine urine in the first case of Bright's disease, I should certainly have used them, as they would have still further proved the existence of sugar.

The sp. gr. of diabetic urine ranges from 1,020 to 1,050.† Albumen is frequently found in it as stated before. Dr Percy infers, from some experiments made in the case of a Diabetic patient, that grape sugar may be formed out of previously assimilated matter, or out of the protoeine series of compounds of the food.‡ If such

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* Vide Ross's Letter, vol. 1 of Lancet for 1844.

† Hooper's Vade Mecum. ‡ Med. Gaz. 1844.

should be the case, it would not prove such a problem to account for sugar existing in albuminous urine, and as generally there is little or no urea in diabetic urine, it is not surprising that we should have it in albuminous urine where there was no urea at all to be found, further, the disappearance of the sugar and reappearance of the urea, may not improbably be owing to a change in the nature of the secondary mal-assimilation influenced by the aromatic sulphuric acid, causing the elements of the sugar to be separated, and forming urea, using a certain amount of nitrogen from the albumen, as stated before when speaking on this singular change under the head of albumen. Another equally curious fact is the discovery of sugar in the fluid of dropsy; no case has been recorded of such a fact being hitherto known, and I can attribute the present case only to accidental circumstances, we know of no reason why it should be existing in the abdomen unless from the saccharine secretion taking a wrong channel, filling the abdomen, and rendering the whole body anasarcous, no albumen was found in the urine nor the least trace of sugar, and still the kidnies were found diseased; the woman was found eating an immense quantity of brown sugar as if her ordinary diet; would this be considered a reason for its existence in the abdomen?

In the notes of her case it will be found that she was ravenous and screaming for food: well, great hunger, as well as thirst, is a common symptom in Diabetes. Now Dr. Prout considers the proximate cause of diabetes mellitus to be partly in the assimilating organs and partly in the kidnies, well, the disease of the kidnies here is difficult to account for, her urine was small in

quantity on her admission, only a few ounces in the twenty-four hours, the cones were found contracted, probably owing to their defective action, and if such fluid did form it must be carried somewhere, but to meet with it in the abdomen is surprising. I shall henceforth pay particular attention to the analysis of dropsical fluids, and if I meet with such another case or several cases, I shall be glad to make them known to the Medical World.

Oxalic acid: this acid in combination with lime was considered rare in urine, but it has been proved by Dr. Bird that it is more common than the earthy phosphates. It is seen under the microscope in the form of beautiful transparent octahedral crystals; when collected and ignited on platinum foil, oxalic acid is decomposed, and carbonate of lime left, which dissolves in dilute nitric acid with effervescence. It is insoluble in aqua potassæ and acetic acid.

Mr. Stanley* has observed the frequent existence of oxalate of lime in the urine of Acute Rheumatism.

Oxalic acid might possibly be formed in the blood when respiration is sometimes difficult, the too slow elimination of the carbon in the lungs, in the form of carbonic acid, causing its union with oxygen in the relative proportions existing in the composition of oxalic acid, two eq. carbon with three eq. oxygen, or, in a direct union of carbonic oxide and carbonic acid, forming oxalic acid which would exist in solution in the blood; the probable cause would be owing to the small quantity of oxygen taken in at each inspiration, which being unable to form carbonic acid vapour with the large quan-

* Vol. 1 Lancet, 1844, p. 138.

tity of carbon to be consumed, would at once form oxalic acid. This idea occurred to me as some of the theories I have read on the subject did not seem very conclusive in all cases, although that of Prout's is generally adopted, and certainly with reason, and there cannot be a doubt that cases do frequently occur where this acid may have been a constituent of certain kinds of deleterious food taken by the patient.

In Asthma complicated with Rheumatism, where oxalate of lime would be found to exist in the urine, my theory of its formation might be considered reasonable, and as there is great difficulty in the arterialization of the blood, it is not improbable that such chemical changes as I have mentioned, might occur.

Urea may be detected by adding to a small quantity of urine in a watch glass, an equal bulk of strong nitric acid: if this is placed in a cool place, crystals of nitrate of urea will be formed; if the quantity of urea is small, evaporation must occur before using the nitric acid; oxalic acid may be used for same purpose.

In the pale-coloured albuminous urine of low sp. gr. there is always a deficiency of urea, this deficiency is uniformly in proportion to the abundance of albumen, a fact which plainly points to a connexion between these two proximate organic principles. In the deep-coloured albuminous urine of average or high sp. gr. again, the urea is not necessarily deficient in quantity.*

Convulsions in albuminuria are said to be owing to a large quantity of urea existing in the blood, and when coma was present it contained less, and when no cerebral

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* Willis's Urinary Diseases.

symptoms were present, scarcely any. But of late, urea has been formed in healthy blood.*

Nitrate of urea has been used as a diuretic in some dropsical affections by Mr. Kingdon, who has published some cases successfully treated, in Vol. I. of Lancet for 1844.

Uric or lithic acid can be detected by the microscope in the form of Rhomboidal Crystals, (fig. 1,) sometimes so thin as to be merely pale, lozenge-shaped laminæ; more generally they are thicker, and by properly adjusting the light their shape becomes marked.

Many appear nucleated, from the presence of certain internal markings, as if one crystal included another.

When the deposit has been of long continuance, especially in cases of calculous disease, the rhomboid outline of the crystal is replaced by a square one (fig. 2). The deposit is then generally high coloured, and the crystals much thicker. Several accidental varieties of these rhomboid and square crystals exist; of these, the most curious present a spindle-like figure, the obtuse edges being rounded, and the margin on either side excavated, (fig. 3) so as sometimes to approach a fleur-de-lys outline. Many uric deposits appear at first sight to be made up of flattened cylinders, presenting a very remarkable appearance, (fig. 4). There are still some other varieties of form.

Urine depositing this acid always reddens litmus paper, and often contains an excess of urea, so as to crystalize slowly when mixed with nitric acid in a watch glass. Its sp. qr. is generally above 1.020.

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* Vol. 2 Lancet, 1844, p. 114.

Urate of ammonia: deposits of this, vary in colour, from absolute whiteness to a pale fawn colour, which is the most frequent tint, brick-red, pink, or purple. All these various coloured deposits present certain characters in common; they never appear in the urine until after it has cooled, and disappear readily on applying heat. The purple deposits require rather a higher temperature for solution than the other. The addition of liq. am. or liq. pot. immediately dissolves deposits of urate of ammonia.*

In the case of constipation of Isabella E. existing for so many months and now in Hospital, I detected an immense quantity of uric acid and urate of ammonia in the urine, which (18th June, 1845) was voided in small quantity, only ℥iij in twenty-four hours, her ingesta was about ℥xvi. of fluid, and even a considerable portion of that she vomited, this patient now lies exceedingly low with fever, added to her other complications.

I procured some uric acid from experiments on my own urine two years ago, by Dr. Reid's method, the crystals obtained were of the size of fig. 5.

Bile is very often found in the urine, not only in Jaundice but in many other diseases, it may very easily be known.

First: by the dark brown colour of the urine.

Second: immersing a clean linen rag in the urine, and its assuming a yellow colour when withdrawn.

Third: a drop of nitric acid allowed to fall in the centre of a thin layer of urine on a white plate, produces

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* Bird's Deposits.

a transient play of colours in which green and pink predominate.

Fourth: add to a few drops of suspected fluid, on a white plate, a little strong sulphuric acid; when the mixture becomes hot, add a drop of a saturated solution of sugar. The mixture will immediately assume a fine purple colour, if bile exists.—*(Pettinkoffer.)*

Fifth: on adding sol. of acet. lead to some of the urine, a flocculent yellow precip. occurs if bile is present, of choleate of lead, from union of choleic acid of the bile with the lead: but this is subject to a fallacy, as acet. lead throws down the chlorides and sulphates.

Earthy Phosphates. Deposits of these salts are always white, unless covered with blood; soluble in dilute hydrochloric acid, and insoluble in ammonia or liquor potassæ. On heating the urine, the deposit undergoes no further change, except agglomerating into little masses. Mucus, pus, and blood, are often present in the urine, and mask the chemical characters of the deposit.

The chemical constitution of the phosphates, and character of the urine depositing them, is well described at page 165, et. seq., of Bird's urinary deposits, and would occupy too much space for insertion here.

Iron, I have on two or three occasions detected in the urine of chlorosis; and have also detected it where patients were on the use of iron internally.

Kiestein I have discovered in the urine of a patient I suspected of pregnancy, the case of which is annexed. I tried a similar experiment on another female who appeared actually pregnant, but her urine did not give any

indication of kiestein whatever, the swelling has now been found to depend upon some other cause.

Vaginal Concretions. I obtained these last summer from a woman who died of some uterine disease, a number of small concretions varying in size from a pin's head to a very small pea, (fig. 2) which were situated between the external or dartoid and the middle coats of the vagina, they were not confined to any particular spot but were chiefly scattered over the anterior surface of the coats; they seem to be of the consistence and hardness of bone, and are probably osseous deposits, I believe no calculi have as yet been found in such a situation. Mr. Guthrie* speaks of a prostate gland existing in the female, but these are not prostatic concretions as they were not found in the prostatic portion of the urethra of this female.

I have now come to the conclusion of my Thesis; and perhaps I have exceeded its required length by some pages, however that circumstance will not be condemned.

It will be observed that I have refrained from dwelling upon the treatment of any of these diseases, as I could not confidently speak on the subject, my experience from the few cases I have seen, being limited on that point; it is as well though, here to state, that Dr. Rees has used mercury in some cases of albuminuria, apparently with good effect†; now Dr. Prout, as I have stated before, considers the abuse of mercury as one of the sources of these diseases.

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* Sexual Anatomy. † Vol. 2 Lancet, 1844.

It will be seen also that I have spoken of those abnormal products particularly, where I could do so from experience, and if some of my assertions prove to be erroneous regarding them, they must be excused, for it is not to be expected that a student, even supposing he should have studied many years, can have a sufficient amount of knowledge to state facts which have frequently puzzled clever and able men. And although these are my first lines on such an important subject, and one worthy of more consideration than I have been able to bestow in a Thesis, still, at a future day, if my life is spared, I hope to resume a subject fraught with such interest and importance to the Profession.

CASES.

No. 1.—*Case of Bright's Disease of the Kidnies, primarily complicated with Saccharo-Albuminous Urine.*

PART FIRST.

Patrick McNamara, ætat 28, a native of Ireland, married, was admitted into Ward No. 10, Montreal General Hospital, on 17th Feb., 1845, under Dr. Sewell. He complained of a swelling in the legs and abdomen; pain in small of the back, shooting downwards and forwards into the groin: pain in the præcordia; general weakness, lassitude, and a feeling of feebleness when walking; loss of appetite; perspirations sometimes at night; bowels regular; pulse 80, slow and compressible; urine voided in great quantity, a thick sediment remaining at bottom, and, upon subjecting to heat, coagulating to a great degree, showing albumen in excess. He presented a pale appearance, nervous temperament, and looked dropsical. He had a similar attack to the present about six years ago, in Ireland, and was there treated and cured after an illness of two months, and underwent a course of Mercury.

Previous to his present illness he had cramps in his hands and legs; he was formerly a gardiner and used to feel pain in the small of the back when digging, and has since been in the habit of dram drinking.

He was put on low diet and no medicine ordered till the 23rd, when Pulv. Dig. gr.ss. and Pulv. Scillæ gr. j were to be taken every morning.

3rd March. Is beginning to feel hungry, and gaining some strength; the urine does not contain so much sediment, but the quantity voided is about the same: its sp. gr. 1.024, feebly, acid

reaction. *Albumen* was coagulated by heat, Nitric Acid, Bichloride of Mercury, solution of Alum, and Ferrocyanide of Potassium. *Sugar* was detected by boiling equal parts of urine and Nitric Acid, which, after cooling, deposited rough crystals of Oxalic Acid; on collecting, and dissolving them in water, they were thrown down in the form of Oxalate of Lime by adding Lime water.

The urine was evaporated to a syrup, which tasted like sugar, smelt like maple sugar, and which was collected as a sample. On the addition of yeast the urine fermented, giving off an odour similar to that of olefiant gas. *Urea* could not be at all detected by the usual means. There were traces of Chlorides and Sulphates, but no Phosphates.

He was ordered to rub his back with Velpeau's Liniment, and to take Potas. Bitart. ʒvi, to day.

4th. Slept badly during the night; he feels a peculiar trembling within his chest, head-ache, fresh pain in small of the back, accompanied with tremors of his body; pulse 72, full and strong; legs more swollen, belly tense and hard, measuring 35 inches, tongue furred.

Allowed Cream of Tartar water as a drink.

6th. Urine voided in the twenty-four hours 3 pints less 3 ounces, sp. gr. 1,026.

The powders of Squill and Digitalis to be omitted as well as Velpeau's Liniment, and to have Acid Sulp. Aromat. ♏x thrice daily.

8th. Feels better, but is pained in the back from the Liniment used, which has produced a papular eruption over the whole back and loins; looks better about the face, still feels weak on walking; coughs occasionally, when pain is felt in præcordia; perspired gently in the night; bowels freely open; pulse 80, small and feeble; measures 34 inches round abdomen, a decrease of 1 inch since 4th. His urine is of a dark brown colour and measured yesterday for the twenty-four hours 4 pints less 3½ ounces, an increase; sp. gr. of that voided yesterday (7th) 1,020, less than that of 6th.

I boiled 4 oz. of urine voided on 6th (the day previous to taking the Aromatic Sulphuric Acid) and carefully filtered and dried it, the solid albumen from which weighed 50½ grains, making 151½ grains to the pound troy. I *also* boiled 4 oz. of urine voided yes-

terday, carefully filtering and drying, the solid albumen yielded was 11 grains, making 33 grains to the pound troy of urine, a difference of 118½ grains per pound between the two only in twenty-four hours.

Both were then evaporated to dryness, when that voided on 6th yielded 45 grains of residue, principally sugar with traces of chlorides and sulphates; and that on 7th, 69 grains and nearly all urea.

The following tests were applied to the new urine, as I shall call it.

Possesses neither an acid nor alkaline re-action.

Nitrate silver produced a white precipitate, a chloride, soluble in ammonia; if a phosphate were present, a yellow precipitate would have occurred not soluble in ammonia.

Muriate of Barytes—a trace of sulphates.

Hydrochloric and hydrosulphuric acids produced no change.

By evaporation and saturating with sulphuric acid a dark, oily, liquid was obtained, which resembled that in preparing sulphate of ammonia.

The same result was obtained with hydrochloric acid.

I evaporated by heat half an ounce of the filtered urine and saturated with nitric acid, when I obtained crystals of nitrate of urea, yielding by weight 6¼ grains.

10th. Measures 35 inches round abdomen; last night he was seized with a very severe cramp across the middle of the abdomen, which lasted about six minutes. Urine voided for last twenty-four hours 4 pints exactly, it has a sweetish smell, sp. gr. 1.040, no sugar present, 4 oz. yielded 15½ grains solid albumen, equal to 46½ grains to the pound troy.

16th. Colour of urine is changed, being lighter and almost natural, sp. gr. reduced to 1.028, 4 oz. yielded 9 grains solid albumen, equal to 27 grains to the pound troy.

23rd. Much about the same, abdomen apparently more swelled, and measuring 36 inches; has had slight gastritis; complains of pain in small of the back; feet more swelled; cramps in his hands; bowels open, but confined during the week; pulse 84, feeble; tongue clean; sleeps soundly, and feels stronger in body.

On 17th, the Aromatic Sulphuric Acid was omitted, and he was again put on Digitalis and Squill, and to have in addition Elaterium, gr.¼, with Pulv. Jalap Comp. ʒi, once daily.

27th. Walks about more easily, but feels weak and feeble; swelling of abdomen much abated; pulse stronger; bowels open; has no appetite; feet as before; passes a good deal of urine, which is still albuminous.

29th. He left the Hospital.

PART SECOND.

He was admitted into Hospital on 29th April, 1845, under Dr. Hall, not in any way improved. He complained of pain in the abdomen; inability to lay on his left side; weakness in the loins; oppression about chest when speaking; headache; dyspnoea; sickness in stomach; his abdomen was very much swelled, measuring 39 inches; legs œdematous; waxy appearance of face; tongue red, not furred; urine of a dark brown colour, no smell, albuminous, sp. gr., 1.016. He took an emetic before admission, and vomited blood with other matter.

I shall confine myself to the characters of the urine and the treatment.

He was put on low diet, Inf. of Dig , and water of the Bitart. of Potass. as a drink.

3rd May. Urine scanty, albuminous, sp. gr., 1.015. Measures 36½ inches round abdomen. Omit Digitalis, and to have Inf. Pyrolæ, ℥ij thrice a day.

11th. Abdomen measures 35 inches; urine lighter in colour, sp. gr., 1.012; sweetish smell; odour resembling sap from the maple; 4 oz. yielded 6½ grs. solid albumen, or 19½ grs. to the lb. Troy; obtained small quantity of Nitrate of Urea.

19th. Voided 5½ pints urine during last twenty-four hours; feels much improved.

26th. Urine dark straw colour; sediment at bottom; no smell; sp. gr., 1.021.

11th June. Swelling of legs gone; abdomen measures 33½ inches; urine now small in quantity, albuminous, feebly acid, sp. gr. 1.032, 4 oz. yields 29 grs., equal to 87 grs. to lb. Troy; urea normal in quantity; no sugar. Was discharged from Hospital in tolerable health.

It will be observed that throughout part second the specific gravity of the urine varied to a remarkable extent.

PART THIRD.

For the third time, was admitted on 24th Oct., 1845, for the same disease, this time suddenly brought on from getting wet at a fire in Griffin Town, a few nights previous. His abdomen was very much swelled, as well as his chest; his urine, as before, albuminous.

On 28th his abdomen measured 38½ inches, and on 6th November 40¾ inches.

18th Nov. His abdomen was so much enlarged and tense, respiration enfeebled, that it was resolved to tap him; and without delay the operation was done, withdrawing 27 pints fluid—this fluid possessed the usual characters of serous fluid of dropsies; although on a former occasion I detected *sugar* in the fluid drawn from a woman.

20th. No bad consequences from the tapping, but the abdomen again beginning to swell. He was ordered

Hyd. Chlor., gr. j; Pulv. Scillæ, gr. iij; Pulv. Dig., gr. ss., thrice a day, in the form of pill.

Cathartic powder to be taken to night.

Dec. 6. Sp. gr. of morning urine 1.010, and evening 1.012. Albumen was feebly detected by the various tests, 4 oz. only yielded 3 grs., equal to 9 grs. to the lb. Troy. Urea existed pretty largely.

January 6, 1846. Measuring 43 inches round abdomen; was again tapped, and 25 pints fluid withdrawn. Sp. gr. of urine 1.011; acid; slightly albuminous.

This abruptly terminates the third part: as this Thesis had to be forwarded to the Secretary of the College.

No. 2.—*Case of Bright's Disease of the Kidnies.*

PART FIRST.

Thomas Garratt, ætat 30, a native of Ireland, was admitted into Ward No. 11, Montreal General Hospital, on 5th June, 1845, under Dr. Hall. He states that three months previous to admission he had a severe pain about scrobiculus cordis, dizziness of the head, pain in the loins, general weakness, and debility; for all which he was treated by Dr. W. Nelson; he after that came to

this hospital two or three times, and was treated as an out-patient; is a single man, joiner by trade, and in the habit of stooping; he has been addicted to venereal excesses.

On admission, the whole body appeared swelled, so much so as to impede walking; he complained of oppression about the chest, soreness at lower part of abdomen, at times weakness in small of the back; pulse was small and weak: in fact, the usual symptoms of Dropsy. On 6th, Dr. Hall prescribed Inf. Dig. ℥ss. thrice a day, which was increased to four times a day on 10th, when he had Pulv. Jalapæ comp. ʒj.

11th June. I examined the urine and found it contained a very large proportion of albumen, which, with the sp. gr. 1.016, proved the disease that denominated Bright's. Four fluid ounces yielded 34½ grs. solid albumen, equal to 103½ to the pound troy. Urine of this sp. gr., according to a table in Bird's Urinary Deposits, should yield in every 1000 grs. 37.28 of solids. The urine smells like milk turning sour, and has a darkish yellow colour, it is voided in small quantity, no sugar present, proportion of urea normal, acid reaction. He measures 39¾ inches round abdomen, the body is more swollen, penis becoming altered in shape and screwed up, scrotum infiltrated, feet and legs enormously swelled and œdematous; pulse 64, slow and slightly full; bowels regular, feels dizzy.

12th. Omit Inf. Dig., and take Pulv Jal. comp. ℈ij. with Elaterium gr.⅙ every morning and evening. Diet changed to milk. His pulse is 64 and full, and two pints urine were voided in twenty-four hours.

14th. Swelling diminishing, measures 37 inches round abdomen, a decrease of 2¾ inches since 11th; pulse small but not weak; bowels freely open; sleeps well, but has headache and dizziness.

22nd. Urine still albuminous, sp. gr. 1.015, containing 34.95 grs. solids in 1000 grains, feebly acid, fine brownish sediment in, which appears in round masses under microscope, with imperfect crystals scattered among them, and all possessing a snuff brown colour. He measures 37½ inches round abdomen, pulse 60, not perceptible at wrist from the swelling, sleeps well.

26th. Measures 35½ inches, swelling decreasing, pulse slow, full and soft, stools watery and frequent, urine albuminous.

4th July. Sp. gr. of urine 1.020, acid, albuminous, containing 46.60 grs. solids in 1000 grains. Measures 34½ inches round abdomen. The same treatment continued.

12th. Body now of natural size, feet only swollen ; felt well, and asked to be discharged ; his urine was still albuminous.

PART SECOND.

He was re-admitted on 23rd July, under Dr. Bruneau. His feet were swollen, and his abdomen slightly so ; urine as before, albuminous. He was put on half diet on admission, and on 25th had Pulv. Jalap. gr.xx. and Pulv. Camb. gr.viij., which purged him very freely ; the powder was subsequently repeated on the 27th and 30th July and 1st Aug. : on the latter date he was allowed chicken broth.

5th Aug. Urine still albuminous, sp. gr. of morning 1.020, and of evening 1.021. Dr. Sewell (under whose care the patient came on 4th) prescribed a warm bath at night and Pulv. Jacob. Ver. gr.x., stating that experiments had been tried on animals, their urine becoming albuminous by covering their bodies with oil silk, which checked the perspiration ; and he would try in this case the effects of free perspiration on the patient, to see whether the albumen would disappear from the urine.

6th. Copious perspiration since the bath, continuing all night. Powder and bath to be repeated.

7th. Urine of a pale straw colour, acid reaction, sp. gr. of morning 1.022, and evening ditto 1.026, containing albumen still but in small quantity, nitric acid scarcely detecting it.

9th. Ordered Inf. Gentian ℥j, Vinum Ferri ʒj, thrice daily. Bath and James's Powder to be still continued.

12th. Improving rapidly, pulse strong and 60. Ankles still a little swollen ; perspires a *great deal* during the day ; bowels regular ; feels strong, and he says well. No abnormal sounds about the chest exist. Morning urine sp. gr. 1.023, pale straw colour, acid reaction, heat detecting albumen, but nitric acid barely doing so.

Was discharged from hospital.

No. 3—*Case of Bright's Disease of the Kidnies.*

Eugene Mc. Cann, a native of Ireland, ætat 34, was admitted into Chapel Ward, Montreal General Hospital, on 3rd July, 1845, under Dr. Bruneau, supposed to be suffering from Anasarca.

He states that about six weeks previous to admission he was working up to the waist in water moving wood, and on his retiring to bed after that, his legs, feet, hands, and face began to swell during the night, and subsequently his whole body became swelled and continued so up to the present period; has always been a very healthy man.

4th July. His abdomen measures 39¼ inches round, pulse moderately full and soft, bowels open. Ordered Pulv. Jalap gr. xx and Pulv. Cambog. gr. viij at 3 p.m., which caused during the afternoon and evening about twenty copious watery stools.

5th. Abdomen is softer, pulse fuller and 96, tongue a little red, urine scanty and containing a dark red sediment, supernatant fluid dark amber colour, sp. gr. 1.014, acid re-action.

Purgative to be repeated on morning of 6th.

The treatment from 7th to 31st was principally Jalap and Gamboge, Cream of Tartar water as a drink, his abdomen painted for several days with Tinct. of Iodine, and on 1st August was put on Infus. of Digitalis. He then came under Dr. Sewell's care, who prescribed on

August 5. Pulv. Jal. Comp. ʒij, and Elaterium gr. ¼ every morning and evening; Inf. Dig. to be omitted. He was most terribly purged with this, and on 6th Dr. S. prescribed the following:

℞ Hyd. Chlorid. ʒss
Pulv. Fol. Dig. ϑj
Scill. Contrit. ʒj

Make the mass into 18 pills, one to be taken every two hours.

7th. He says he is £20 better; pulse 84, passes urine freely.

9th. His urine was heated and slightly coagulated, nitric acid also detected albumen. His former medicines to be omitted and to have a warm bath, with Pulv. Jacob. Ver. gr. x at night, and to be cupped over the loins.

12th. Treatment of bath and James's powder continued; he

measures 42 inches round abdomen, makes a good deal of water, pulse is regular.

13th. Urine acid, sp. gr. 1.016, heat detects albumen in small quantity, nitric acid feebly shows it; colour of urine is dark yellow.

19th. Was so much swelled, being 45 inches round abdomen with great dyspnœa, that he was ordered to be prepared for tapping on 20th, which was accordingly done, and 22½ pints of serous fluid withdrawn, and the abdomen tightly bandaged.

22nd. No bad effects. Ordered Ext. of Taraxacum ʒij thrice a day in water and milk.

24th. Ordered to be bled to 10 ounces, to promote absorption and assist the medicine.

29th. Ordered Inf. Dig. ℥j thrice a day in addition to the Taraxacum.

26th Sep. He measured 33 inches around the abdomen.

2nd Oct. Form of the body is natural, urine voided 5 pints, albumen could only be detected by Ferrocyanide of Potassium and Bichloride of Mercury; his appetite very good; was discharged well.

No. 4.—*Case of Anasarca where Tapping was performed: the fluid withdrawn containing sugar; terminating fatally.*

Rose Kelly, ætat, 37, a native of Ireland, married, was admitted into Ward No. 4, Montreal General Hospital, on 23rd June, 1845, suffering from Anasarca. From the very low state in which she was brought in, (seemingly dying) no previous history of her case could be obtained; but we found that her dropsy must have existed for 4 or 5 months. A parcel containing about a pound of brown sugar was taken out of her pocket by the nurse, and the parcel looked as if it had contained about 4 lbs. of sugar.

She was ordered 4 oz. of wine, and was put on Squill, Calomel, and Carb. of Ammonia. Her urine, which was obtained with difficulty, produced no precipitate by boiling, Nitric Acid detected nothing, Liquor Ammonia caused a little cloudiness increased by

boiling, the precipitate soluble in acetic acid, showing the presence of phosphate of lime; Oxalate of Ammonia, a white precipitate, the ammonio magnesian phosphate; its sp. gr. 1.013; acid reaction; no sugar could be detected.

24th. Her legs, thighs, abdomen, back, chest, in fact all the body except the arms enormously swelled and œdematous; is constantly screaming for food and her parcel of sugar; she seems ravenous, and even robs her fellow patients of their food; stated herself to be pregnant, which however was not the case.

25th. Great Dyspnœa; pulse 108, very small and feeble: Dr. Hall instantly resolved to perform Paracentesis Abdominis, which was accordingly done at noon, and $24\frac{1}{4}$ pints of fluid withdrawn; her pulse became fuller and stronger after the operation, but during it she had to be supported with wine; she was firmly bandaged. I tested the fluid as a matter of curiosity, and strange to say found sugar present. The fluid was of a pea-green colour; neutral; albumen in large quantity; no urea nor uric acid; phosphates in excess; sp. gr. $1.0122\frac{2}{9}$. I examined for sugar as follows:

Trommer's test. I added a solution of sulphate of copper, sufficient to tinge the fluid slightly blue, a deposit of phosphate of copper occurred; liquor potassæ was then added in excess, a heavy precipitate of hydrated oxide of copper fell, which was redissolved in the excess of alkali, forming a blue solution like ammoniuret of copper. On heating the mixture to ebullition, a deposit of red suboxide of copper fell—sugar was thus doubly detected.

Capezzuoli's test. I added a few grains of blue hydrated oxide of copper to some of this fluid, in a conical glass vessel, and rendered it alkaline by adding some liquor potassæ. To prove the presence of sugar, the fluid assumed a reddish colour, and in a few hours the edge of the deposit of oxide assumed a yellow colour, which gradually extended through the whole mass from the reduction of the oxide to a metallic state.

Moore's test was not satisfactory.*

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* I performed these experiments before Dr. Hall, who seemed satisfied with their correctness; he tried the same at his own house, but failed in detecting sugar; the fluid was then some days old.

26th. Pulse 112, a little full, severe pain in the back, belly again swelled but with wind, urine of a white colour.

Ordered an Anodyne Liniment to rub the abdomen, and an Enema of Ol. Terebinth to open her bowels.

I was absent till the 30th, when I found on my return she had been improving, but at 2 o'clock p.m. of to-day, severe pains in the abdomen commenced, increased on pressure, her knees were drawn up, pains across her shoulders, restlessness, head-ache, constant crying and moaning, pulse 116, very small and feeble. She was again put on Wine.

1st July. No improvement, pulse 136, quick and sharp, severe pain in the back, very weak, swelling of abdomen entirely diminished, now eats nothing.

2nd. She died at half-past 8 a.m.

Autopsy. Body very much emaciated; liver small, and gall bladder contracted; a quantity of fluid existed within the abdomen with flakes of lymph floating through it, peritoneum inflamed round about where the tapping was performed, with lymph adhering to its surface; kidnies were longer than usual, of a dark greenish appearance externally and indurated, the tubular portion or cones seemed contracted, and the vascular portion was hard, but gave way easily on squeezing with the fingers, possessing also a dark brown colour on its cut surfaces, the pelves of the kidnies were remarkably small. Heart and lungs healthy. May it not be probable that disease of the kidnies was the cause of the dropsy in this case, although there was no remarkable deviation in the healthy character of the urine?

No. 5.—*Case of Catarrhus Vesicae with Stricture of the Urethra and Syphilis.*

John Paxton, ætat 54, seaman, a native of England, was admitted into Ward No. 11, Montreal General Hospital, on 12th June, 1845, under Dr. Hall, suffering from a large Chancre on glans penis, secondary eruptions on the inner sides of both thighs, a number of boils on the back of the neck, stricture of the urethra

which had existed for twenty years, and constant dribbling away of his urine for the last three weeks. Bougies had been passed into the urethra about eighteen years ago with relief, when a seaman in the Navy; he was afterwards treated for the stricture in the Naval Hospital, Chatham, where he was partially cured. On 13th, Dr. Hall endeavoured to pass the catheter, but without success, as false passages had formed evidently in the prostatic portion of the urethra, and now offered obstruction; he was ordered to remain quiet, and to have the chancre cauterised with Argento-Nitrate of Mercury, a new salt, which I had recently prepared. There was a strong ammoniacal odour from his whole body.

14th. Is able to retain his urine since attempted introduction of bougie yesterday; and on examining his urine, which is of a light yellow colour, a large quantity of purulent mucus is adherent to the bottom of the vessel, of a viscid tenacious character and strong ammoniacal odour, forming a continuous rope when poured from one vessel into another; I detected no urea, I supposed in consequence of its combination with the elements of water and forming carbonate of ammonia, which process would be aided by the excess of mucus present in the urine; has voided four pints during last twenty-four hours and is alkaline. The chancre has on a dry yellow scab; pulse 94, full, strong, and hard; bowels confined; tongue clean. Was ordered Inf. of Buchu, ℥iv, thrice a day, with 1 Pil. Hyd. every night.

15th. The urine does not contain so much purulent mucus, and the chancre has assumed a fine healthy appearance. Sp. gr. of urine 1.0125, containing 27.96 grs. solids in 1000 grains (principally sulphates and chloride sodium) according to Dr. Bird's Table; Alkaline.

22nd. Chancre nearly well, eruption on thighs fading, is able to retain his urine much longer, still alkaline, sp. gr. 1.0175, containing 39.61 grs. solids in 1000 grains, quantity of pus and mucus very much decreased; treatment continued.

26th. Is about well, can retain his urine longer still, and passes it in a full stream, it does not contain near so much purulent mucus.

Felt desirous of leaving, and was discharged.

No. 6.—*Case where Pregnancy was detected by the urine showing Kiestein.*

14th Oct. 1845. Laid aside in a glass vessel some urine of a young girl named Rafferty, in Ward 13, Montreal General Hospital, whom I suspected of being pregnant. After two days repose, it became quite cloudy and a thin pellicle began to form on its surface of a very greasy appearance which continued to increase till the 7th day, this pellicle seemed then complete and broke during the afternoon and fell to the bottom, I kept the urine a short time longer and then threw it away. This girl was probably in her 4th month of pregnancy. The phenomena observed tallied with those related in Dr. Golding Bird's work on Urinary Deposits.

Some time after, the truth of this experiment was proved by Drs. Hall and Crawford, who distinctly heard the Bruit de Placentaire.

Table showing the ordinary Appearances of the Urine in different Diseases, extracted from various authors.

Synocha.	Scanty and high coloured, depositing a red sediment.
Typhus Mitior.	Pale and watery.
Typhus Gravior.	At first pale, then becomes extremely high-coloured and fœtid, and in the last stage often deposits a dark or black sediment.
Feb. Intermittens	Cold stage : scanty, pale, and limpid.
	Hot stage : high-coloured.
	Sweating stage : deposits a sediment.
Synochus Icterodes.	1st stage : deep-coloured and but little in quantity.
	2nd stage : small quantity and of a dark croceous colour.
	3rd stage : sometimes total suppression of, black colour.
Feb. Infantum. Remittens.	Scanty and high coloured.
Feb. Hectica.	During exacerbations, urine is high coloured and deposits lateritious sediment.
Cachexia.	High-coloured and depositing a dark, and often fœtid sediment.
Rachitis.	Turbid.
Purpura Nautica.	Transparent, high-coloured, and acid.
Arthritis.	Acute form, high-coloured.
Paraplegia.	Generally highly ammoniacal and prone to form calculous deposits.
Phthisis.	High-coloured and deposits a branny sediment.
Hydrothorax.	Is in small quantity.

Dyspepsia.	Pale, depositing a red (lithic acid) or a white sediment (the Phosphates), with an oily pellicle on the surface.
Enteritis.	High coloured.
Constipation.	In a case, existing for nearly twelve months, in the Montreal General Hospital, I have procured large quantities of uric acid; urine very scanty.
Tympanites.	Dysuria and in some instances even Ischuria.
Cholera Maligna.	Suppressed.
Icterus.	High coloured, yellow, containing bile.
Hepatitis.	High coloured.
Peritonitis.	Scanty and high coloured.
Ascites.	At first urine is diminished; after as distension increases, high coloured, thick and scanty, depositing lateritious sediment.
Anasarca.	Small in quantity, high coloured, and deposits a reddish sediment.
Scarlatina.	Sometimes albuminous.
Granular disease of Kidney.	*Acute form.* Scanty, highly albuminous, occasionally bloody.
	Chronic form. Scanty or superabundant, pale, sometimes cherry red, or brown, and often muddy.