excited heart becomes exhausted and dilated in its futile attempts to maintain tension in unfilled arteries.

Iodine.

Iodine is often more valuable than thyroid, as its metabolic effects, as shown by Professor Stockman, are attained by its stimulating action on the thyroid gland. I have seen two cases of exophthalmic goitre produced by the rather excessive use of iodine. Both these cases got rapidly well on the stoppage of the drug. As a rule I prefer for medicinal use the tincture of iodine and the syrup of iodine and tannic acid to the more stable iodides. The latter, however, are more easily prescribed in compound mixtures.

Adrenalin.

This remedy raises arterial tension, and is, as a rule, injurious in arterio-sclerosis, but when combined with thyroid or iodine it occasionally does good by maintaining arterial tone and stimulating the heart.

Citrates.

Dr. A. E. Wright has shown that the citrates have a decalcifying effect on the blood. At first they lessen its coagulability, but, after prolonged use, this again increases, and Dr. Wright believes that this is due to the citrates dissolving the lime salts out of the tissues.

Benzoates.

The benzoates have long been favourite remedies with me, especially where the kidneys are involved. I have frequently seen uraemic convulsions cease under their free administration. They are said to convert uric acid into the more soluble hippuric acid, and I believe they also eliminate other purin bodies. Like the salicylates, they have a cholagogue action.

Sulphates and Sulphites.

The sulphate and hyposulphite of sodium, sulphate of magnesium, and numerous purgative mineral waters have a good effect in clearing out the intestinal tract and in lowering blood pressure.

Chlorides.

The chlorides are pressor agents, and consequently their use should be limited. Calcium chloride should be avoided unless there be some indication for its use, such as a severe haemorrhage or cardiac failure. Sodium chloride should only be taken by gouty individuals in limited quantities.

Depressor Agents.—Dr. George Oliver has added some valuable agents for lowering blood pressure to our armamentarium, such as the hippurates of ammonium and sodium, lichenin, leucin, and Witte's peptone. The nitrites are exceedingly valuable for emergencies, but their effects are too evanescent to render them desirable for constant use.

Ladies and gentlemen, my wish is that your lives, whether long or short, may be characterized by efficiency.

REFERENCES.

¹ *The American Journal of the Medical Sciences*, March, 1904. ² Note on the Agglutinating Power of the Blood, by John Hay, M.D. ³ *The Purin Bodies of Food Stuffs*, 1903. ⁴ *Guy's Hospital Reports*, vol. lv. ⁵ *The Lancet*, April 30th, 1904. ⁶ *BRITISH MEDICAL JOURNAL*, December 5th, 1903. ⁷ *The Lancet*, June 17th, 1899, and June 20th, 1903.

THE INTERNATIONAL MEDICAL PEACE ASSOCIATION.—The first official banquet of the International Medical Peace Association, founded by Dr. J. A. Rivière, of Paris, to help in the suppression of war, was held on December 15th, 1905, Dr. Rivière, the President, in the chair. The speakers, among whom were Professor Langlois, Dr. Bérillon and Professor Richet, dwelt on the prominent part in bringing about the reign of universal peace which the medical profession throughout the world is destined to play by its social influence. The Association, which was founded only a year ago, has already a membership of more than 600 members, all belonging to the medical profession.

A DIRECTORY OF DEFAULTERS.—It has already been stated in the *BRITISH MEDICAL JOURNAL* that the medical practitioners of St. Louis recently decided to publish a directory of defaulters for their own protection. The first edition of this directory will, it is said, contain the names of some 15,000 persons who have forgotten to settle their doctors' bills. The work, which will be entitled the *St. Louis Medical Credit Guide*, will be kept up to date by the issue of a monthly sheet, and will be revised once a year.

An Address

ON THE

SIGNIFICANCE OF SMALL QUANTITIES OF SUGAR AND OF ALBUMEN IN THE URINE.

READ BEFORE THE ILFORD MEDICAL SOCIETY.

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My attention was first attracted to the question of slight albuminuria in youths by having to see the successful candidates who had just passed a severe competitive examination. The number who had a small amount of albumen in the urine was considerable, somewhere about 1 in 12. In most it proved to be transient, but in a few it persisted. What the after-history of these lads was I cannot tell, as I was unable to follow it out. My attention has also for some time been directed to cases in which a trace of sugar is found, like the albumen, almost unexpectedly, at all events almost accidentally. What significance are we to attach to the finding of small and not persistent quantities of albumen and of sugar in the urine?

I desire to omit from consideration those cases in which on the one hand there is indubitable evidence of renal degeneration or of diabetes on the other. The cases we now want to consider are totally distinct from those in which there is evidence of mischief of either sort; this has already been indicated above by the fact stated that the condition is often accidentally discovered.

Whether these cases of slight albuminuria or of glycosuria are not, in some instances at least, related to those showing signs of actual disease; whether, indeed, in some, it is only a question of the different stages of the clinical history; whether, in other words, permanent pathological changes do not in some cases develop or become evident later on; is one of the questions we have to ask ourselves not infrequently in trying to arrive at a diagnosis and prognosis when dealing with these patients.

The two conditions—the presence of albumen and of sugar in the urine—may at first sight appear totally distinct and may not seem to have much, if any, connexion one with the other, but I think that closer examination will show that both conditions may arise, if not from the same causes, at least under similar circumstances. These are cases in which by reason of strain, of long continued severe mental exertion, anxiety, or other such cause, the metabolic processes have been disturbed, the digestive functions have become disordered, and the nutritive activities seriously hampered, with the result that we find our patient more or less out of health, and although most probably we cannot put our finger on any definite sign of actual organic disease, we feel that things are not going rightly, are not working smoothly, and on examining the urine we find a certain amount of albumen or of sugar, or of both. We see this condition mostly in the young and in my experience mostly in males.

Another class of case, which I mention only to put it on one side, is one with which we are all familiar—namely, persons of pronounced gouty type, whose urine contains a trace of albumen, and who at times also pass small quantities of sugar, which, under treatment, and under favourable conditions of diet and climate, disappear, to recur again if health becomes disturbed; and if our patient attains to old age, as these persons not infrequently do, to become more or less persistent, but never acute, and counting only for so much evidence of general and gradual degeneration, to be summed up under the head of "senile change." These cases form a class by themselves.

ALBUMEN.

We sometimes hear the term "physiological albuminuria" employed. I may say at once that I doubt the justice of the term. I doubt, indeed I deny, the existence of physiological albuminuria. I believe that since normal urine admittedly contains no albumen, all albuminuria is

pathological, I mean in the widest sense. That there may be no evidence of course or progressive change associated with its appearance I grant, and where there are no evidences of organic disease, where after a time it disappears, and health is apparently entirely restored, we may call it functional, for want of a better term; but that there are abnormal conditions of nutrition, of digestion and of the circulation of the kidney, involved in its appearance, I have myself no doubt. Because these disturbances are temporary and slight and are recovered from, we do not therefore need to doubt their existence.

Different explanations have at different times been offered. Probably no one explanation is wholly right or applicable to all cases. Writing as long ago as 1881, Austin Flint, a careful and sound pathologist, recognizing disturbance of circulation as a cause, observed that:

While spasm of the small arteries of the kidney has not been actually demonstrated as a pathological occurrence in man, it is assumed to exist in a variety of conditions which are attended by, or followed by, slight temporary albuminuria.

That acute and careful observer, Dr. Osler, the recently appointed Professor of Medicine at Oxford, says:

In a normal condition of the kidney only the water and the salts are allowed to pass from the blood. When albuminous substances transude there is probably disturbance in the nutrition of the epithelium of the capillaries of the tuft, or of the cells, surrounding the glomerulus.

He goes on to state his opinion that the presence of albumen in the urine, in any form and under any circumstances, may be regarded as indicative of change in the renal or glomerular epithelium, a change, however, which may be transient, slight, and unimportant, depending upon variations in the circulation or upon the irritating effects of substances taken with the food or temporarily present.

One more quotation only before I pass on. Butler in his *Diagnostics of Internal Medicine* (pp. 631-633) says:

Probably the presence of albumen in the urine always implies some interference with the integrity of the epithelial cells of the glomeruli of the tubules, which epithelium, when intact, prevents the passage of the proteids of the blood into the urine. Speaking of the so-called functional albuminuria, he says, "a large proportion of these cases recover after a time, but in some the albuminuria becomes persistent, the pulse tension is increased, and organic changes develop."

Enough has been said, I think, to lead us to hesitate before we look too lightly upon the occurrence of even traces of albumen in the urine, but, on the other hand, unless we have evidence of increased tension in the arteries, or of casts, etc., showing epithelial desquamation, we need not take too serious a view of these cases. Formerly, no doubt, all such patients were supposed to have Bright's disease; then a reaction set in, and those cases of temporary albuminuria were spoken of too lightly as of little or no consequence. My point is this—where we find small quantities of albumen without any other signs of disease, while we cannot ignore or make too light of the matter, we are wise if we pause and wait, meanwhile putting our patients under as favourable conditions as possible in regard to work, environment, and diet. My belief is that, under favourable circumstances, most of them do well, but that, under conditions the reverse of favourable, a certain number, at least, drift on into organic disease.

The unfavourable conditions comprise strain, over-anxiety, overwork, unsuitable clothing, exposure to chills, unwholesome food, and the free use of alcoholic stimulants. Where it can be attained a sea voyage is often attended by excellent results; if this course cannot be followed a change to a mild equable climate is good, and if the patient cannot leave home then let him lead a quiet, simple life, avoiding exposure to changes of temperature, hot rooms, late hours, and over-fatigue. Attention to diet is necessary, not only as to what the patient eats, but seeing to it that meals are not hurried, and that there are no long fasts and no large meals, or, in other words, that the food is simple and light, and that it is divided into small or moderate meals.

These means give him the best chance for the restoration of the disturbed equilibrium between supply and demand, that is, between the ingoings and the excretion of waste. I will give an example of the sort of case I mean, one that I have been able to follow for the last 15 years.

In 1889 I saw a young man who was manifestly out of health, though in a somewhat vague and indefinite way. He had been an active boy at a public school, entering into games, and having usually quite good health. Suddenly his life was altered. He went into his father's business, and being a conscientious, somewhat sensitive lad, he not only set himself diligently to learn his work, but did not avail himself of all the liberty he might have had as regards relaxation and exercise; his life suddenly became sedentary. For some little time before I saw him he had gradually been losing his former good health and sense of well-being; he was depressed; he had not the same strength and energy as he used to have; he suffered from constipation, and he felt the cold weather try him in a way he had never before felt. Physical examination revealed no evidence of organic disease in chest, etc., but on examining the urine it was found to be of specific gravity 1020, and contained a trace of albumen and of sugar. He was able to carry out a scheme which proved successful; he went away to a mild south-west coast place, then he went for a long voyage, and he has now for a number of years been in the enjoyment of excellent health, while he keeps up a moderate amount of exercise.

Another example, I might here mention, is curious and interesting, as, apparently, the nervous conditions were so unstable that the very fact of coming up for examination was enough to bring on temporary albuminuria.

A young man came before me some few years ago to be examined for life insurance. He did not look strong, and though there was no evidence of cardiac weakness his circulation was languid. A little albumen was found in the urine, but no sugar. He was advised to come up again in a few months' time. Meanwhile I communicated, with his doctor, who treated him and made frequent examinations of the urine, reporting it after a time free from albumen. The proposer, therefore, came up again, and again there was albumen in the specimen passed at the time of examination. The same process was repeated several times, the doctor writing to me that he found albumen present after each time the patient had been up to town for examination, and that it gradually diminished, and in a few days disappeared.

That is a case in which I should give a guarded prognosis; the slowness of the cause seems to me to indicate grave instability, and I should be afraid that later on organic changes will follow.

As regards the significance of albuminuria from the point of view of life insurance, I am not prepared to go as far as those who say that all proposers whose urine shows any albuminuria should be refused, but I do not consider that they can be classed as first-rate lives, even when all traces of albumen have ceased and remained absent for some considerable time. I think they should be postponed and given the chance of coming up again, when, if the albumen has disappeared and the physical condition is in every way satisfactory, they may probably be accepted at an increased rate.

SUGAR.

With regard to traces of sugar in the urine in the same class of patients of whom we have already been speaking, I look upon the appearance of sugar as indicating more serious disturbance in the nutritive processes than is shown by a trace of albumen. I do not mean that it at all necessarily implies any permanent organic change. I do not think it does, but the appearance of sugar in the urine in young people does mean that for the time being the powers of digestion and the working out of the chemical equations in the system are not at all satisfactory. In middle-aged people I do not think that a small amount of sugar is of such grave import; it is usually found in what are termed free livers, a synonym often for large eaters who also consume a considerable quantity of alcohol. The late George Johnson spoke of them as "people in whom the taste for rich food had survived the power of digesting it." I have seen the sugar entirely disappear in some cases when the habitual constipation that accompanied it had been overcome.

One young man whom I know had some years ago a trace of sugar in the urine for some time. It was, I believe, due to over-training, and especially to trying to train and to work hard at business involving a considerable mental strain as well. He had got into the habit of eating largely of meat and had kept it up too long after the special exertion—in this case rowing—had ceased. A careful diet and an improved condition of the action of the bowels led to the disappearance of all unpleasant symptoms. He remains well, but has to be careful to guard against constipation, and he has given up hard rowing.

We are told that whenever the sugar in the systemic blood exceeds a definite amount (about 0.2 per cent.) it is discharged by the kidneys, producing glycosuria. We

can therefore easily realize that, given circumstances such as I have narrated in the foregoing cases, the occurrence of glycosuria is just what we should expect. Sugar in the urine of young persons, even without the presence of any symptoms of diabetes, such as wasting, thirst, etc., is a much more important matter than when occurring in people past middle life, and in some cases, I fear, could we follow out the clinical history, would be found to end in diabetes.

We have at present no definite means of arriving at a sound prognosis, but if there has been some distinct breach of the laws of healthy living—a breach that can be overcome—and if the response on the part of the system is ready and complete when the cause has been removed, then I think we can take a hopeful view.

I have recently seen a rather delicate boy of one of our public schools whose urine showed a trace of sugar but no albumen. He had worked very hard during the term before Christmas, and when at home for the holidays seemed tired, thin, and not up to the mark. Examination showed a trace of sugar in the urine. I felt that the only thing was to advise his removal from school for a term, to diet him carefully, and to have the urine looked to periodically for some time to come. I confess that I am somewhat uneasy as to the future history in this lad's case, although at present he keeps well.

Another case I may mention, because the patient is doing well, and it is now eight years since I first saw him.

He was then 22, out of health, and the urine, of moderate density, contained a trace of albumen and of sugar. Last year the patient's general condition was satisfactory, and the urine was free from albumen and from sugar.

The occurrence of sugar in the urine in young subjects must always occasion us some anxiety, even if it does not persist, for the reason that we feel that there is a risk of its passing on to diabetes, a disease so often rapidly fatal in the young.

CONCLUSIONS.

1. I think it may be said that the presence of albumen in any appreciable amount in the urine is not normal or physiological, but that it does not necessarily imply coarse pathological change, and that it does not necessarily mean that the existing disturbance of function is permanent or progressive. At the same time, it cannot be denied that a certain number of cases which at first are rightly placed in the above category do later on show signs of definite organic kidney disease.

2. That the presence of sugar in the urine in any appreciable quantity is abnormal, that in the young it is of serious import, and that if persistent, it is likely to lead on to diabetes; that in people past middle life, and especially in those of gouty type, it is of less consequence and usually yields to treatment more or less speedily, to recur, however, in some cases, under conditions similar to those under which it first appeared.

3. That the presence of both albumen and of sugar in the urine indicates serious disturbance in the metabolic processes, calling for relief to the nervous strain which the patient may have been undergoing, and an adjustment as far as can be of his environment, but that under favourable conditions these patients may continue in at least fair average health for many years.

CLINICAL ESTIMATIONS OF PURIN BODIES IN GOUTY URINES, ETC.

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DESPITE the numerous publications upon the metabolism in gout and the allied conditions, the advance towards the real etiology of the disease is very slow. For practical purposes it still is necessary to confine our attention to the eliminated products, although, from the theoretical standpoint, the intermediary changes of metabolism now form the chief centre of interest. The substances resulting from the decomposition of proteids and nucleins by bacteria and ferments are at present being carefully investigated, and already it has been demonstrated that certain micro-organisms and ferments possess the power of breaking down amino-purins into simpler substances and of oxidizing the latter into uric acid. Evidence has

also been adduced to show that in extracts of the spleen, lung, liver, intestine, muscle, and kidney, there exist hydrolytic ferments which, in the presence of a sufficiency of oxygen, are able to transform the amino-purin to an oxy-purin, and finally to uric acid. In kidney, muscle, and liver extracts ferments which are able to break up the newly-formed uric acid are thought to be present. Whether such conditions obtain in the living organs is not yet determined. Ferments are able, we know, to act in a reverse direction, and therefore the effects of their action *intra vitam* may be quite different from that ascertained from extracts of organic tissues. The relation of the ferments to the large quantities of hypoxanthin produced in the muscle tissues during ordinary muscular contraction is also at present undetermined.

During the period necessary for the accumulation of facts ascertained by experimental investigation and of the records of the elimination of endogenous purins, we may do something towards the betterment of the gouty individual by an endeavour to introduce an element of exactness into the measures for dietetic treatment. If, in the meantime, we agree to practically neglect uric acid in regard to the etiology of gout, we cannot yet overlook its importance in regard to treatment, since it expresses the degree of hepatic sufficiency and thus indicates the amount of tissue reaction to the general toxæmia. There are numberless theories from which our choice of causation may be made, but the only, or almost only, well-grounded reason for prophylactic measures is the presence of an excess of uric acid in the tissues. So far as we know to-day, we are unable to prescribe any medicinal treatment which directly affects the deposited uric acid. We are, therefore, driven to regard dietetic treatment as the at present only available resource, and to recognize its great possibilities. The determination of the individual capabilities for certain foods has already mitigated the severity and recurrence of the attacks in many cases of gout. The value of the exact estimation of the individual factor, as opposed to the haphazard construction of dietaries, lies in the fact that it is of supreme importance to the gouty individual that he should be sufficiently nourished, and that his daily food should approach, as nearly as possible, the régime to which he has been heretofore accustomed. A knowledge of the "personal powers" often permits a greater choice of foods than one may dare to allow when giving empirical directions. When the patient is able, within certain limits, to follow his fancies and usual habits, his mental condition is less constrained than is the case with a patient who is placed under a rigid or a severely-restricted dietary. This recognition of the mental factor is of much comfort and importance to the gouty patient, and possibly tends to sustain the nervous control of the liver functions.

Since 1902,¹ when I first suggested the determination of the individual powers of assimilation for purin substances, I have had the opportunity of examining many gouty cases for this purpose, and have had the satisfaction of observing a retardation of the course of the disease and a diminution in the number of the acuter manifestations. I append an example, additional to those recorded in 1903.² The Table I indicates the procedures followed and precautions observed.

TABLE I.

Days.	Dietary.	Urinary Purin Nitrogen.
1	Diet of milk, bread, cheese, eggs, milk, oats, etc.	0.2010
2	" " " " " " " "	0.1560
3	" " " " " " " "	0.1600
4	Plus ½ lb. beefsteak=0.25 gram purin nitrogen	0.2560
5	Purin-free diet again	0.1760
6	" " " " " " " "	0.1650
7	" " " " " " " "	0.1560
8	Plus ½ lb. beefsteak about=0.50 gram purin nitrogen	0.2463
9	Purin-free diet	0.1560
10	" " " " " " " "	0.1800
11	Plus ½ lb. beefsteak=0.28 gram purin nitrogen	0.2445

In this case it will be observed that, while the addition of 4 oz. of best beefsteak (weighed raw) was followed by an immediate output of about 38 per cent. of the purin ingested, the addition of 8 oz. of beef resulted in an output of only 16 per cent., the remainder being retained in the system. Taking 40-55 per cent. as an