CLINICAL REMARKS ON TRANSIENT GLYCOSURIA OF NEUROTIC ORIGIN.

By JAMES F. GOODHART, M.D., F.R.C.P.,

Physician to Guy's Hospital.

We often hear nowadays of the albuminuria that is not due to disease of the kidneys, so much so that one would almost believe that it is quite a common occurrence. Whether it be so or not is not my purpose now to discuss, but I often wonder when reading papers on this just now fashionable topic that so little is said about the glycosuria which is not diabetes, which in my experience is certainly a commoner disorder of the urine. No doubt this is greatly due to the fact that such cases have been frequently described, and textbooks state quite correctly that over-work, care, and anxiety are frequently attended with saccharine urine. But for our present purpose the frequency of a disease or of a symptom is that which most entitles it to the attention and commands the interest of a meeting such as this; and therefore it is that I have put a few cases of this sort together for your consideration. I had thought that glycosuria, when transient, was supposed to be associated with, or in some way dependent upon, the gouty diathesis, but several cases within recent memory that have come before me have not been, so far as I could ascertain, in the least gouty, and they were, on the other hand, all of them either in markedly neurotic people or associated with over-work or worry.

The notes, I am sorry to say, are but fragmentary. The first case was a man, aged 57. His family history was unimpeachable, and he himself was free from gout or rheumatism. He would not allow himself to be a nervous man. All that could be got from him was that he had been working very hard with his brain of late, and that he had had lumbago. His urine when examined was found to contain a good deal of sugar, but he had no polyuria.

In my room he passed urine of specific gravity 1024, containing sugar 6 grains to the ounce. He was put on a moderately restricted diet, with half a grain of codeia three times a day, and an occasional dose of Carlsbad, and he was sent for a holiday. The sugar quickly disappeared from the urine, and he has remained quite well ever since.

The second case was that of a man, aged 38, a healthy man, but decidedly excitable, and described by his family as excessively nervous. It is a little difficult to say in what this nervousness consists except that he is over-anxious as regards little ailments in his family, and is mildly mercurial in temperament; and he is one of the most persistent and copious producers of phosphatic urine that I have known. One sister is decidedly neurotic, and there is apparently a strong cancerous tendency in the family, his mother and two brothers having died of it—two of cancer of the liver and one of cancer of the oesophagus.

It was after the death of one of his relatives that he came to me, looking worn and anxious, with pains in various parts of his limbs, but with no definite ailment; he was out of sorts, and felt uneasy about himself. I believe he fancied that he might be going off like his mother and brothers. I made him pass some urine, and found it of specific gravity 1026, and the colour of Pavy's fluid was at once destroyed by boiling. I cheered him up, told him to take a tonic of strychnine, quinine, and iron, and sent him off. Another examination four days later still gave the sugar reaction, but a week later the specific gravity was 1018, and the urine was natural. I have seen this patient several times since, and his urine has always been free from sugar, although it is frequently phosphatic.

Another case is that of a man aged 48. His father lived to 94, but had gout for many years. His elder brother had an attack of "nervousness," which sounds suspiciously suggestive of downright insanity. One relative died of diabetes, but I was unable to push questions in that direction lest the fears of the patient should be aroused. He has a largish family, and rents from the Emerald Isle to feed the items on. He came to me in a deplorably wrecked

state of nerves, trembling all over, and half sobbing as he detailed his varied feelings. He told me that he was always nervous, but that now he was especially knocked down by having lost his senior in a bank, whom he had known intimately for many years, had been closely associated with in his work for some time, and upon whom—as being a stronger mind—he had in great measure leaned. His urine was specific gravity 1022, contained lithates in excess, but also a good deal of sugar. He had no thirst, and no polyuria. I gave him some quinine, strychnine, and hydrobromic acid, reassured him, and told him to take a holiday. A week later the urine was 1022; it still contained a good deal of sugar. Three days later the specific gravity was 1020. Four days later specific gravity 1024, and a good deal of sugar; and then it finally disappeared. I have seen him many times since, and have examined his urine at least ten or a dozen times, and he has remained quite well.

Another man, aged 49, an exceedingly well-informed man, and holding a leading and very anxious position in the political world of one of our colonies, in addition to all the worry involved in holding office in a Colonial Parliament, had had a lot of domestic anxiety as well, and some six or nine months before I saw him he had consulted his usual medical attendant for a distressing pain across the lower part of the abdomen, and a frequent inclination to micturate, although he would pass very little urine at a time. He had also had much constipation, which was unusual to him. He was a healthy-looking man, somewhat anxious about himself, but feeling all the better already for the rest and change of the voyage over to England. Before he started the sugar had been copious, the specific gravity 1035 and 1040, but the quantity natural. His urine was now 1026, and contained 31 grammes per litre. The next day there was none; the next day a trace; the next none again; and so on. The feature of the case was the irregular appearance of the sugar. I made sixty examinations in the course of seven or eight weeks, and sugar was absent in thirty-six specimens. There had been none, when I saw him last, for several days, and only a trace for some days before that. He never had any polyuria, and the specific gravity averaged about 1024 or 1025. He was dieted to some extent—not very rigidly—and codeia and nux vomica, half a grain of each, given three times a day. Some urgent business called him home again unexpectedly, and I have not heard of him since; whether he is thoroughly well or not I do not know.

Another case is that of a man of 48, who had rheumatic fever when 18 or 19. He has never had gout. He has lived well. He is of decidedly neurotic type, fond of riding and driving, and he goes at a breakneck pace regardless of consequences, which have been grief to him more than once; but if anything happens to him either in business or pleasure his nerve tone collapses, and he becomes cowed and depressed quite beyond recognition. I wish it were possible to convey to your mind's eye the picture of the two sides of this man, big, jovial, bouncing when he is well; slouching, drawling, despondent, limp in mind and body when he is glycosuric. I had seen him once or twice with bad boils, but never with glycosuria, till one day he came saying that he had been quite knocked over by worry in business, and he quite looked it. If ever there was a dog with his tail between his legs it was he, and then. He had had an attack of pain in his side, which had suggested that he was suffering from gall stone; and Dr. Duncan's is the first note I have, that the urine contained sugar. His urine was at that time specific gravity 1025, and abnormally acid.

And perhaps here I may digress for a minute, to say a word about this attack of hepatic colic, as there is a point of special interest about it in this way. The resulting swelling was very persistent, and to palpation there was an ugly, hard, rather irregular swelling, more like a projecting tight-laced liver than anything else, which, with some history of cancer in the family, made us for the time somewhat uneasy. But it slowly subsided. What the exact state of affairs is in such a case it is not altogether easy to say; it was certainly much harder and more irregular than one is accustomed to ascribe to any acute congestion. His abdomen was not in such a condition as could allow us to suppose that we came down directly upon a gall stone, but I suppose that some local inflammation, plus gall stone and local swelling of the liver adjacent, do, by their combination, sometimes lead to the production of a mass such as is difficult to distinguish at once from a cancerous one. The practical point is that such cases are not very uncommon. I remember seeing an old lady with my friend, Mr. Roots, of Kingston, two or three years ago, who had a

very large hard mass in her abdomen, which had come on in the same way, with a severe colic and more jaundice in that case, and whose age justified the strong suspicion of cancer. The swelling entirely disappeared.

In another case, a lady of between 60 and 70, the medical man positively and unhesitatingly committed himself to cancer to the friends. I remember it well, because I had no doubt, in that case, that the lump was gall bladder. Still it will serve to show the difficulty that exists sometimes, for that was six or seven years ago, and the lady is, I believe, still alive. And quite recently I have had a man in Guy's, sent up by my friend, Mr. Coles. I will only say that his age, his history, his appearance, and the characteristics of the lump all combined to make me fear the existence of cancer. He had a severe attack of pain a short time ago, passed a lot of gall stones, and is, I believe, now in a fair way to get well.

But to return. Our patient was fed on a light diet, had an injection of morphine at first, and then, I think, a little opium and belladonna given him, and, subsequently, a tonic of dilute mineral acid and bark. He speedily pulled together again, and the sugar disappeared.

I have seen that man twice again since then with a similar history of worry—too much work and too little recreation; and combined, I think it must be admitted, with some irregularity of living, although he is certainly not a drinker. On each occasion he has been thoroughly out of condition, and his urine has contained sugar, but he has had none of the characteristic symptoms of diabetes. The second attack he quickly got well of by a tonic and rest; the third he is passing through now.

A gentleman, aged 59, whose mother had nerves, and who had done a great deal of hard head work in a responsible position, suddenly about ten years ago became melancholic. The state of his urine is not known, but he says that his attack then was quite like later ones. He was sent away at this time to Wales; while there he was little better, to his thinking, and suddenly, on his way back in the train, as he describes it, "the veil lifted." He was quite well, and so remained for ten years. In 1887, he was attacked in precisely the same way. From being a high-spirited, cultivated man, who made friends with all whom he met, he became despondent, morose, and irritable, and wasted rapidly. He had no inordinate thirst, had a dryish tongue, a little frequency of micturition during the day, but none at night. His urine was found to contain sugar in quantity. He was dieted and had medicine, and went abroad under medical supervision; but he returned not appreciably better; and again, after he had been a short while at home, the cloud lifted, the sugar left his urine, and he was perfectly well.

Last year he had a third attack of exactly the same kind, and again, after about eight weeks of mental wretchedness and glycosuria, the two conditions departed, leaving him bright and jovial as before. He was dieted to some, but not very rigid, extent, and treated by quinine and strychnine, and rest from all mental labour.

A somewhat similar case in an older man was one that I saw once with Mr. Stokes, of Lee, last year. He was an old man of 75, who for three years had been seen, on and off, with attacks of mental depression and glycosuria. In these attacks he not only became depressed, but also drowsy, languid, with dry tongue, and the sugar in the urine increased to a considerable quantity. It never was altogether absent, but was only slight at times. In this case, in addition to the sugar, there was at the time of my visit a copious deposit of uric acid also, so that, although there was no history of gout or lithæmia, it seemed likely that it belonged to this class of cases, if the two may be distinguished.

Of two other cases I have still more fragmentary notes. I saw each case but once: A solicitor, aged 58, in large city business, and who had had much worry of late, was brought to me for glycosuria. He had been seen by Dr. Hilton Fagge several years before, and sugar found in the urine. He had had no symptoms of diabetes, save some little dryness of the mouth. There had never been anything unusual in the quantity of urine passed. His urine had been examined from time to time, and now and again sugar had appeared. But for two years there had not been anything more than a trace until lately, when it had reappeared under stress of work. He was made to rest and his diet restricted somewhat, and when I saw him his urine was of specific gravity 1022, and quite normal. It should be said that he had never had gout, nor was there any in the family; but he was a full-faced, flushed-looking man, and he was accustomed to his port on "birthdays,"

and I unfortunately did not ask him how often these came. He was advised to get more rest, to live upon a moderate diet, and I think he had some salicylate of soda, and he remains well.

Another case was also a solicitor, a young man. He had been sitting up late at night, drinking strong tea, and by these means had knocked his nerves up completely. He became afraid of meeting anyone; a sudden noise would startle him, and make him quake, and palpitation of the heart was no infrequent occurrence. Three weeks before I saw him he had a bad attack of quinsy, and his medical man examined his urine and said it contained a good deal of sugar. He had no other symptoms of diabetes, although perhaps he does pass a full quantity of urine, and is always thirsty. He told me also that he thought he had passed sugar in his urine on one other occasion, and that then also it was in the course of a quinsy, to which he was prone. By the time I saw him the urine was quite natural. He was enjoined to keep himself warm, to be moderate in the consumption of sugars, starches, and tea, and in smoking, and for the rest to consider himself a sound man.

The last case I only narrate to show how necessary is a routine examination of the urine. A man of 36 was brought to me by Mr. Gibson, of Aldershot; he was very neurotic, and had had a sunstroke, or what the patient called one; but I should judge it was a simple fit of giddiness, and he had never been well since. He had suffered from all sorts of subjective sensations and erratic pains. He had slowly improved on a tonic, until he had the misfortune to fall through a trap-door some ten or twelve feet, which naturally produced a very severe shock, and he had never recovered from this. I could make out nothing decisive; he was depressed in manner and slow in speech, and all his reflexes were exaggerated. His nervous system was evidently decrepit, but that was all that one could say. His urine had been examined shortly before and found natural, so that there did not seem much to be learnt in this direction, and I was just on the point of dismissing him, when he asked to be allowed to empty his bladder. As the urine was there I examined it, and found a quantity of sugar. He has been moderately dieted, and has taken a tonic, and the sugar slowly disappeared from his urine and he is now quite free.

These cases seem to me to be of interest from one or two points of view. In the first place their chief features are, that the glycosuria occurs in a particular type of subject, and after worry or overwork, and the sugar is temporary, even though it may recur again and again in the same individual. It has been considered, as I have said, that these cases are of "gouty" nature, and upon the basis of intimate and exhaustive study of the physiological chemistry of uric acid and glycogen, Dr. Latham has suggested a very helpful treatment by the salicylates and benzoic acid; whereby the waste products are diverted to other formations, more easily disposed of, and sugar ceases to be found in the urine.

But we may allow all this, and there is yet room for the contention that gout, and its relative glycosuria if you like, owe their being to something further back in the economy than a simple repletion with waste products. We all know that there is many a case of gout engendered straight out of anxiety, and there is many a case of gout too which no amount of dieting or drugging will eradicate; although perhaps this may be in part due to the fact that the chemist cannot make his kettle boil.

But it may be gathered from cases such as I have mentioned, that glycosuria is often a nerve storm, or paroxysmal neurosis, if you like that way of putting it better, and I should certainly be much inclined to go with Dr. Latham, and think that in all probability there is some truth in his contention, because there is a strong resemblance between the glycosuric storm and the storm of uric acid, which is a well-known feature of disease in some individuals, and no doubt too, the two phenomena sometimes appear together or alternate, as at any rate in one of the cases I have given. The interest of this as regards glycosuria, for my present purpose, is this; that being so, it comes thereby into line with other so-called functional malacities, and by so doing the neurotic origin of diabetes derives strong confirmation. I have in former times done something in conjunction with Dr. Frederick Taylor, to combat the statement that definite lesions can be found in the central nervous system in diabetes. I believe that the objections advanced against that assertion still hold good; and that no one has yet seen the lesion which causes diabetes. Nevertheless I do not doubt that the disease is owing, perhaps not always, but in a great majority of cases, to faulty action of the nervous centres, and I believe mostly of the central nervous system, although we cannot see the lesion. That this is so is all but sufficiently plain

from what is well known as regards confirmed diabetes and its hereditariness; the fact that many cases attribute the onset to prolonged or heart-breaking anxiety; that some are the direct outcome of injuries to the nervous centre; that anon it follows acute and nerve-depressing illness, such as diphtheria. But this position is, I think, still further advanced and strengthened when transient glycosuria is brought into the same view, because the evidence is rendered much more complete. Transient glycosuria and the persistent form, or diabetes, then become part and parcel of one process, corresponding closely in these two features of remission and duration, with other maladies or states with which we are quite familiar, and whose neurotic origin no one would question.

For instance, I see their parallel in the simple heart-beating that is an everyday occurrence in the hundred and one excitements of life, and in that persistent rapidity of pulse occasionally seen in aortic and other cardiac affections, which is one of the most distressing and intractable complaints which we are called upon to treat. Again, they correspond in many ways to common blushing, also an everyday occurrence, and to the remittent blushing or flushing so common and so worrying in a multitude of phases in the neurotic woman, or in those whose sexual functions fail of development or fulfilment. And the resemblance perfects itself in that state of perpetual blush which is exophthalmic goitre, and even to this detail: that exophthalmic goitre is occasionally associated with remittent glycosuria—as I have reason to know from the case of a lady whom I occasionally see with Dr. Uthoff, of Brighton. In none of these affections can we yet demonstrate a lesion, and I think that from the study of the remittent forms of each, it becomes clear that, as diseases, the whole group is on the borderland of pathology only, which can never be very easy of demonstration, for, though morbid in one sense, it is but physiological excess in another.

The practical bearing of all this would seem to be that, as in some phases of this vasomotor disturbance, as it is—and I believe rightly—called, so in those that are glycosuric the early conditions are very successfully treated, without the necessity for any great anxiety on the part of the doctor, by good nerve tonics, such as strychnine, arsenic, quinine, and hydrobromic acid; by careful dieting and relief from worry; by rest from brain work, and change of scene. When the conditions are pronounced with either one or the other they are very intractable; and that they are not then easily remediable let both diabetes and exophthalmic goitre bear witness.

I think, too, that as opium is a remedy of unquestionable value for diabetes well established, so with paroxysmal glycosuria. Small doses of that drug have a steady power over the nervous system or circulation which is of value in the wrecked conditions which seem to me so often to precede and accompany it. And for the same purpose it might be well to make trial of antipyrin in these cases. I say this with some hesitation, first, because I have no experience of my own to relate; and secondly, for the reason that, being recommended for nearly everything nowadays, one eyes it askance as an acquaintance who has got into bad company, and whose reputation is hardly up to his professions. However, there are records of such cases. My friend, Dr. Battiscombe, of St. Mary Cray, told me lately of two such that he had seen, and it naturally occurs to one that a drug of so undoubted a value in migraine, in some cases of chorea, of whooping-cough, and other conditions that may all go under the head of paroxysmal neuroses, it might quite possibly be of value in such a condition as that now under discussion, and certainly is worth a trial.

ULSTER MEDICAL SOCIETY.—At the meeting of this Society on December 4th, the adjourned discussion upon the Notification of Infectious Diseases Bill was resumed. After some debate, the following resolution, moved by Dr. Lindsay and seconded by Dr. O'Neill, was carried unanimously: "That this Society approves of the application to Belfast of the Notification of Infectious Diseases Bill, provided that suitable accommodation for the reception of infectious cases be afforded by the municipality. It is also of opinion that the carrying into effect of the provisions of the Bill should be vested in the chief sanitary officer." Dr. O'Neill showed two interesting and successful cases of nerve suture. Dr. Lewers read a paper upon "The Abuse of the Out-patient Department of Dispensaries and Hospitals," the discussion upon which was adjourned to the next meeting.

ON THE CENTRAL MOTOR INNERVATION OF THE LARYNX.

A PRELIMINARY COMMUNICATION.

By FELIX SEMON, M.D., F.R.C.P.,

Assistant Physician in Charge of Throat Department, St. Thomas's Hospital.

AND

VICTOR HORSLEY, B.S., F.R.S.

Professor of Pathology, University College; Assistant Surgeon to University College Hospital.

(From the Laboratory of the Brown Institution.)

In 1886 and 1887 we carried out a large series of experiments (over 100) on different species of animals—monkeys, dogs, cats, and rabbits—with a view of investigating the central motor innervation of the larynx. Circumstances have hitherto prevented us from completing these researches; but we have received so many requests from those interested in the subject that we should publish our results, if only in a preliminary form, that we desire to comply and to add the deductions which we think may be legitimately concluded from our experiments. At the same time we wish to state distinctly that this is only a preliminary communication, and that we shall lay a full account of the experiments on which our conclusions are based, together with a complete theory of the motor innervation of the larynx, before the Royal Society in next May or June. We shall also give a full description of the same before the International Medical Congress at Berlin in August next.

The conclusions which we have arrived at are as follows:—

1. There is in each cerebral hemisphere an area of bilateral representation of the adductor movements of the vocal cords, situated in the monkey¹ just posterior to the lower end of the præcentral sulcus at the base of the third frontal convolution, and in the carnivora in the præcrucial and neighbouring gyrus. This area has a focus of intensest representation in the anterior half of the foot of the ascending frontal convolution. Stimulation of this point produces complete bilateral adduction of the vocal cords, which lasts as long as the stimulation is continued. Should, however, the latter be unduly prolonged the "*besoin de respirer*" overcomes the influence of the artificial stimulus and evokes a momentary but powerful abductor movement of the vocal cords. Stimulation of the more peripheral parts of the area evokes less and less perfect adductions as we proceed from the focus outwards, and when the extreme margin of the area is excited only what is known as the "cadaveric position" is assumed by the vocal cords.

The above description applies to the monkey, dog, and rabbit. In the cat we have observed curiously different conditions, for which, at present, we are not prepared to offer any explanation.

2. We have not been able to find an area of representation in the cortex of the abductor movements of the vocal cord.²

3. If one of the cortical areas for adduction be so completely excised that stimulation of the neighbourhood of the lesion produces no effect upon the larynx, and if the wound be allowed to heal aseptically, no paralysis of the cords is observed. Further, if subsequently the corresponding area in the opposite hemisphere be excited, just as completely bilateral an adduction of the cords is produced, as if the opposite area were intact.

From the above facts we infer that:

(a) Unilateral irritation produces bilateral effect. Thus clinically in any irritative unilateral affection of this area, spasm of the glottis, that is, bilateral adduction of the vocal cords, may occur, for example, in laryngismus stridulus. That this view is not purely theoretical is shown by the association, in severe cases of the last-named illness, of the glottis spasm with the so-called carpo-pedal contractions. This association is most easily explained on the assumption that we have an overflow of energy from the laryngeal to the neighbouring cortical areas for the limbs.

(b) Unilateral destruction produces no effect. There is, therefore, no such thing as unilateral paralysis of a vocal cord from lesion of a cerebral hemisphere, as has been asserted. The truth of our statement is made evident by the fact that motor aphasia is not identical with aphonia. Moreover, the observation by one of us [F.S.] of several patients with complete

¹ Demonstrated to the Physiological Society, 1887.

² *Vid. sup. re the cat.*