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Observations on a Case of Diabetes Insipidus, with an Account of some Experiments on the Urine. By Mr Thomas Jarrold, from Essex, Student of Medicine at Edinburgh.

MARGARET POTTER, aged nineteen, of a fair complexion, and of a somewhat full habit of body, was admitted, on 28th May 1801, into the Clinical Ward of the Royal Infirmary, at Edinburgh, then under the care of Professor Gregory. She complained of the common symptoms of menorrhagia, under which she had laboured for upwards of two months. For this the pulvis aluminis compositus was successfully prescribed, and on the 2d of June, the menorrhagia had ceased, and she complained only of a slight œdema of the lower extremities. The pulvis aluminis compositus

positus was then omitted, and in its place ten grains of the pilulæ scilliticæ were ordered to be taken morning and evening. That the effect of this medicine might be ascertained, the urine was desired to be measured daily; by which it was discovered that this discharge was in much greater quantity than natural,—a circumstance which till that time she had carefully concealed. But as this circumstance rendered her case interesting, it may not be improper to give a short account of her previous history.

For the last five years, she had been employed at a cotton-manufactory near Hamilton, at which she was confined fourteen hours a-day, standing nearly the whole time. As her employment required but little exertion, she was seldom warm through the winter; nor did her own habitation increase her comforts. But, notwithstanding every privation to which she was subjected, her health continued good till the middle of March, when going down a flight of steps, her feet slipped, and, with very great exertion, she saved herself from falling. Immediately after this, the menorrhagia began, and on the evening of the same day, she

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experienced

experienced inordinate thirst, attended with a very profuse discharge of urine.

After this circumstance was detected in the Hospital, her urine, though without any sweet taste, was often found to amount to upwards of fifty pounds in the space of twenty-four hours, sometimes even to sixty, and one day to seventy-two pounds; and from excessive thirst, she employed nearly an equal quantity of liquid, by way of drink. After a trial of different remedies, her urine and drink were reduced to between ten and five pounds in the day, under the use of the powder of galls and lime-water; and she was dismissed from the Hospital in good health about the middle of August.

As it was important to know the nature of this disease, as far as it could be learned, by ascertaining the quality of the urine; and as Professor Gregory's very extensive professional engagements rendered it impossible for him to pay that strict attention to it which he wished, he requested me to analyze the urine, and acquaint him with the result. As this was somewhat interesting, I shall here briefly state it.

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The sensible qualities of this urine were not easily distinguished from those of the urine of a healthy person, when much diluted with water. When it was examined by the tests recommended by Fourcroy, Vauquelin, and Cruickshank, all the ingredients of healthy urine were detected, but in smaller proportions than in the natural, except the muriatic acid, which was often in excess.

Notwithstanding these appearances, the urine in one day became ammoniacal, and somewhat putrid;—a circumstance, the more difficult to account for, as the gelatin and albumen, which effect this change, were so trifling, as to require close observation to detect them. But a change, thus singular and unexpected, must be brought about by a powerful agent; and what that agent was, is a subject of curious inquiry. It was evidently not sugar, as this substance could never be discovered to be present; and if it had been present, it would have produced a contrary effect. But it may have been what Mr Cruickshank endeavours, with some probability, to prove to be the basis of sugar, namely, mucilage.

cilage. And this idea is favoured by the following experiments.

EXPERIMENT I.

To an ounce of this patient's urine, was added a dram of lime-water, and ten drops of an infusion of nut-galls. A white precipitate took place, greater than from healthy urine. The colour of the urine was at the same time changed to a dark green, inclining to black. To ascertain how far this appearance was peculiar to the present patient, the urine of many other sick persons, and also of persons in health, was treated in the same manner. But on none of them was a similar change produced, excepting on the urine of a diabetic patient, who is since dead, and on that of a patient with acute pneumonia, whose urine contained a very unusual quantity of animal matter.

EXPERIMENT II.

To an ounce of her urine, were added a few drops of a solution of acetat of lead, which

which threw down a very small quantity of phosphoric and muriatic salts.

EXPERIMENT III.

To the urine, already treated with the acetat of lead, a few drops of Goulard's extract of lead were added, which, with the muriatic and phosphoric salts, throws down albumen, gelatin, and mucilage. Upon this, a copious precipitation took place.

EXPERIMENT IV.

To an ounce of urine, as voided, a few drops of Goulard's extract of lead were added. This threw down a precipitate out of all proportion larger than that which was produced by the acetat of lead, indicating the presence of some animal substance in great abundance. From the known deficiency of gelatin and albumen, it is fair to conclude that this was mucilage.

I have avoided giving the weights and measures of the different precipitates, because they
daily

daily varied in their proportions, and because the results were so different one from the other, that the eye was a sufficient judge of the disproportion. But to guard against deception, every product was weighed, and by this more accurate method, the general facts mentioned in the experiments were fully confirmed.

Should it be objected, that mucilage has no tendency to produce the ammoniacal smell, to hasten the putrefaction of other substances, or to putrefy itself, I have to observe, that the urine of the diabetic patient, alluded to in Experiment I., was alternately sweet, and of the natural taste. In this last state, I repeatedly examined it, and I found it to become, in the course of one day, extremely ammoniacal. It then exhibited all the appearances of the urine, now under consideration, discharged by Margaret Potter. They differed, however, in one circumstance; for when the diabetic urine was even the most ammoniacal, yet on its being evaporated and burnt, it gave out the smell of *caromel*, which the other did not. But this only proves, that sugar actually formed, existed in the one, and not in the other, though in such small quantity as not to be detected

ted by the taste. This test of the presence of sugar, ought perhaps to be more frequently had recourse to than it is.

Having mentioned to Professor Gregory, that nut-galls and lime-water produced a considerable change on this urine when out of the body, he observed with his accustomed liberality, that they were of the description of the medicines he intended to prescribe, and that he would make choice of those particular articles. How far they contributed to the removal of the disease, it is perhaps difficult to ascertain, as the complaint to appearance was on the decline when this medicine was first administered.

The following circumstances, however, give me a favourable opinion of the effects of the medicine. On using the medicine for a few days, the urine ceased to put on a green colour. Another circumstance also worthy of notice, is, that at this period the pain of the kidneys began to abate; and with this perhaps, as a consequence, the nausea and vomiting, which had often been troublesome. In addition to these circumstances, it may also be mentioned, that from the time she began

gan the nut-galls and lime-water, she recovered her strength very rapidly. From these considerations, this combination of medicine appears worthy of farther trial in similar cases; and if there be sufficient evidence to conclude, that the urine of this patient abounded with mucilage, and if mucilage be the basis of sugar, this medicine merits attention in cases of confirmed diabetes.