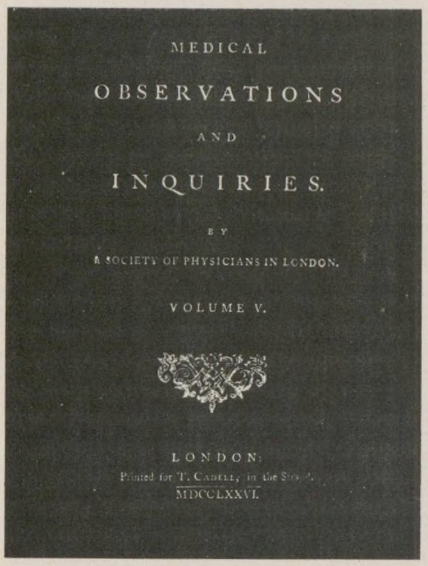
Men and Medicine



Matthew Dobson

Thomas Willis was apparently the first to describe the sweetness of the urine in patients with diabetes mellitus. (His observation was published four years after his death in 1675.) However, evidence that the sweetness of the urine was due to the excretion of a sugar was not advanced until a century later, when Matthew Dobson presented his findings before the Medical Society in London.

All that is known about Dobson is that he was born in Yorkshire and was the son of a nonconformist minister. Although destined for the clergy he preferred medicine and took his degree at the University of Edinburgh in 1756. He was a friend of John Fothergill in London and was a member not only of the highly select group that made up the Medical Society (London) but also was elected a fellow of the Royal Society. He was physician to the Liverpool Infirmary from 1770 to 1780, after which ill health forced his retirement. He died in 1784.

Although there is little information available about his personality and character much can be guessed from his simple, precisely-planned, and clearly-described experiments published in 1776 in the *Medical Observations and Inquiries of the Medical Society*.

EXPERIMENT I

Some of this patient's urine, which was quite transparent and of a very pale straw colour, sweet and not the least urinous to the taste, was set by in an open vessel to observe its spontaneous changes. This was in the month of November, when Fahrenheit's thermometer stood about 52 during the warmest part of the day.

In 24 hours, a separation began to take place; some wooly clouds appeared, which gradually subsiding covered the bottom of the vessel with a loose white precipitate. At the same time, air bubbles were detached, which carried small portions of the wooly clouds to the surface, where they remained suspended. This intestine motion continued for several days, and produced a thin head on the surface of the urine, much resembling that which is formed on the surface of fermenting liquors. On shaking the vessel, the intestine motion was increased, and a vinous smell was easily distinguished. Soon after this the fluid became sourish; and the resolution going on, the next change was to the keen smell of vinegar.

The further and last change was to the putrid and offensive.

EXPERIMENT II

Eight ounces of blood taken from the arm of this patient, exhibited after standing a proper time, the following appearances. The *crassamentum* had a slight buff, a due degree of firmness, and was in the usual proportion to the *serum*. The serum was opaque, and much resembled common cheese whey; it was sweetish, but I thought not so sweet as the urine.

EXPERIMENT III

The urine of this patient, exposed to a boiling heat, suffered no degree of coagulation.

EXPERIMENT IV

Neither was it coagulated, on being mixed with the mineral acids.

EXPERIMENT V

Two quarts of this urine were, by a gentle heat evaporated to dryness, under the inspection of Mr. Poole, apothecary to the hospital, and Mr. Walthall, one of the house apprentices. There remained after the evaporation, a white cake which weighed ʒ iv. ʒ ij and ℈ ij. This cake was granulated, and broke easily between the fingers; it smelled like brown sugar, neither could it from the taste be distinguished from sugar, except that the sweetness left a slight sense of coolness on the palate. It had no saltness, nor was there any effervescense, on the addition of the acid elixir of vitriol; but on the addition of a more concentrated vitriolic acid, an effervescence ensued, and some fumes arose which had the pungent smell of the marine acid.

Dobson concluded "that a considerable quantity of saccharine material passed off by the kidneys in this case of diabetes, and probably does so in every instance of the disease, where the urine has a sweet taste. . . . This saccharine matter was not formed in the secretory organ, but previously existed in the serum of the blood. . . . This idea of the disease, also, well explains its emaciating effects, from so large a proportion of the alimentary matter being drawn off by the kidneys, before it is properly assimilated, and applied to the purpose of nutrition."

In addition to these clearly stated conclusions some others are implicit in the reported findings: The reported opaqueness of the serum, like whey, suggests lipemia; the absence of effervescense of the urine when acid was added suggests a marked decrease in urine (and hence blood) bicarbonate.