more particularly of the first—urea. The methods recommended in the works on animal chemistry and organic analysis are, however, very far from satisfactory.

Thus Simon, in his *Chemistry of Man*, effects the determination of the quantity of urea by forming the sparingly soluble nitrate, and Bowman, in his medical chemistry, resorts to the acetate, but both of these are very tedious and very disagreeable operations, and what is worse, uncertain in their results. Liebig has recently recommended the ternitrate of mercury, but the preparation of the test liquors is troublesome, and since the estimate eventually depends on the production of a particular tint or shade of a yellow color, it cannot be exact.

There are however some simple methods which will give absolutely accurate results. These all depend on the principle, that urea and uric acid, when brought in contact with nitrous acid, undergo immediate decomposition with a brisk effervescence, owing to the escape of carbonic acid and nitrogen gas.

The quantity of these nitrogenized principles in the urine may be ascertained by determining the quantity of carbonic acid or of nitrogen thus set free, during the destructive decomposition of urea and uric acid by nitrous acid. Forty-four parts of carbonic acid, or twenty-eight of nitrogen, answer to sixty of urea.

One of these methods which is extremely exact, I have recently described in the London and Edinburgh Philosophical Magazine. It is to conduct the disengaged carbonic acid into water of barytes, and weigh the resulting carbonate of barytes.

I have also, in examinations which I am constantly making of the urine, frequently resorted to the other plan of estimating the urea, from the quantity of nitrogen set free; and this I have done in two different ways:—1st, by determining the quantity of nitrogen by weight; or 2nd, by volume. The following is a more particular description of each of these:

A liquid suitable for the decomposition of urea is easily and economically prepared by taking a single cell of Groves' voltaic battery, and placing strong nitric acid in the porous cup, and otherwise charging the cell in the usual way. After a few minutes the nitric acid turns green, becoming charged with nitrous acid. It is then to be decanted for use. If this liquid be poured into urine, filtered from its mucus, or into a solution of urea, a brisk effervescence sets in, and if a sufficient quantity of acid is used, so that red fumes are disengaged, the urea is totally decomposed, carbonic acid and nitrogen gases escaping.

In the first of the preceding methods, viz.—That of determining the urea from the weight of the nitrogen, a known weight of urine (2 grammes), filtered from mucus, is placed in a bottle containing a tube filled with the nitroso-nitric acid above described: from the bottle a bent tube conducts the escaping gases through potash-water, and then through a chloride of calcium tube. The operation is conducted in the manner well known to laboratories for the analysis of the carbonate, the loss of weight of the whole apparatus gives the quantity of nitrogen which has been set free. This operation requires about half an hour, and is quite exact.

In the second method, viz.—that of determining the urea from the volume of the resulting nitrogen—the operation is essentially the same, only instead of letting the nitrogen escape into the air, it is received into a gasometer, and its quantity ascertained. As conducted in my laboratory, the amount of urea in a sample of urine may thus be determined in from ten to twelve minutes, and with certainty, to one thousandth part of the weight of the urine; a degree of exactness far beyond that of the old processes, and an expedition which at once recommends this method to the physiologist and pathologist.—*From the Virginia Medical and Surgical Journal.*