

the resources of the most accurate chemistry to furnish him with quantitative analyses of the phosphates in the urine, but at the end of his most laborious researches he is unwilling to commit himself one way or the other, to any opinion on the subject! There is, no doubt, something in these finer mental actions, which, though they may produce death by "shock" or may produce such formidable symptoms as those of chorea, hysteria, epilepsy, &c., still may not be measured by the chemical balance. But at the same time I feel it right to tell you that both in America, in Germany, and France the discovery of phosphate in the urine, after inflammation of the brain or nervous excitement engaging the brain material has been strongly insisted upon as an actual fact.

In rickets, according to the excellent authority of Lehmann, the phosphates are decidedly increased in the urine, as also in tuberculosis; this latter fact agrees with the view now generally entertained that in the process of cell formation the most essential inorganic element is phosphorus in some of its forms or combinations. It is said oxalic acid is sometimes found, and carries off the earthy phosphates in rickets, &c., no doubt there is a coincidence of the two generally in the urine in such cases as I speak of, but still phosphate of lime is not soluble in oxalic acid. Phosphate of lime as well as phosphate of magnesia, as found in the urine, it is well to recollect are in the condition of amorphous powders, while the ammoniacal magnesia phosphate is in crystals. If you wish to be correct, I think it is as well you should take particular note of this, as some of the class-books may mislead you.

[Dr Parks next explained to his class how the phosphoric acid in urine in clinical practice and elsewhere might be detected and measured after the "Volumetric" method. The essence of this plan depends on the fact as observed by Liebig that phosphate of iron is altogether insoluble in acetic acid. A certain quantity of solution of chloride of iron, therefore, is first taken; and to a measured amount of urine, to which acetate of soda and acetic acid are added in certain proportions, the chloride of iron is dropped in. A paper dipped in yellow prussiate of potash tells when the process is completed and all the phosphate separated. The subsequent ascertaining of the quantity of phosphoric acid in the urine is a matter of simple detail.]

There are fallacies of twenty per cent, even in the best concerted plans of estimating the phosphates, so that we are, as yet only at the threshold of the inquiry; but I would advise pupils to make themselves familiar with these "Volumetric" methods of Liebig, which are very ingenious: and as regards the phosphates the "Volumetric" plan is the best we have.