

subject according to the point of view from which it has been studied. Thus, some have studied the phosphates only as they appear as a sediment in the urine, others have separated the earthy and alkaline phosphates, but have neglected the total amount, whilst others have, very properly, I think, considered the total amount of phosphate excreted to be the only proper basis for a practical study of the subject. According to this last view, phosphaturia means any deviation from the normal amount excreted, whether increased or diminished. As might be expected, the views put forth by various authors differ as much as their methods of studying it. Some declare it to be merely a symptom of disorder of the stomach or liver, others believe it to be only a question of reaction, etc.

In order to prove that I am not drawing on my imagination, I shall trouble you with a few short quotations from prominent authors. Prout: "nervous irritability the cause of increased excretion of phosphates;" Berce Jones: "merely depressed acidity;" Dickenson: "exaggerated mobility the cause of an excess of phosphate;" Dana: does "not find excess in nervous irritation;" DaCosta: "in spite of the distinct sediment of phosphates it is doubtful if the latter are in excess;" Beale says: "there is not really an excess, but the urine being alkaline, the earthy phosphate is thrown down."

I need not trouble you with any more quotations. I have given enough to show the indifferent manner in which the subject has been studied. In my opinion, the important thing is to ascertain the amount of phosphoric acid excreted, but as this would be somewhat troublesome, we adopt the simpler method of estimating the amount of phosphate. The base with which the acid is excreted is largely dependent on the diet, if that be full the tribasic compounds are common, and the urine is neutral or alkaline, but if the diet be low the reaction becomes acid from preponderance of monobasic compounds and no phosphate is precipitated although there may be more present. Hence, precipitation is rather an evidence of deficiency than excess of phosphates. Indeed, it must always mean either an excess of base, or a deficiency of acid.

A similar change may be brought about by the administration of alkalis. A patient whose urine

does not present any precipitation of phosphates is given alkalis, and in a short time it becomes muddy and deposits a crust of phosphate on the vessel. Now I am satisfied that increased alkalinity may be the result of true dyspepsia, or even of some peculiar diet, but an increase or deficiency of phosphoric acid to any notable degree and for any length of time, must have an entirely different cause. When dyspepsia occurs under such circumstances, it will always be found to be due to some nervous disturbance. This is an important and definite statement, and if I am wrong I would be glad to be shown my error. If it be true, then it must be important to ascertain whether the amount of phosphoric acid is increased or diminished in all such cases. On examining a sample muddy with precipitated phosphates, if I find the amount of phosphoric acid increased, I order more rest to the nervous system; if on the other hand, I find that the amount of phosphoric acid is normal, I request for a time a change or reduction of diet. In the latter case there is an increase of base due probably to diet; in the former an increase of acid due to nervous exhaustion.

The phosphates appear in the urine in three principal forms; the triple phosphate, earthy phosphate, and crystalline calcium phosphate; each of which, if continued for any length of time, has a certain amount of clinical significance. The triple phosphate is found in cystitis, in states of decomposition of the urine, and in some disorders of digestion, and along with other symptoms is valuable in deciding a doubtful diagnosis. The earthy phosphate, when largely deposited, generally indicates a neutral or alkaline condition of urine, which, if pathological and continued for a length of time, is an indication of a grave constitutional disturbance. The crystalline phosphate of lime is, according to my observations, found mostly in chronic diseases of the brain. If a doubtful diagnosis lay between some functional disturbance and an obscure disease of the brain, the discovery of this salt in the urine would decide me in favor of the latter. On more than one occasion I have seen this symptom determine the diagnosis, and correctly so, as the future histories showed. In only one case have I seen it absent where I felt sure there was organic disease of the brain.

But as before stated, the most important point