

III. PHOSPHATES.

About two to six grams are excreted in twenty-four hours. The phosphates of Ca. and Mg. constitute about one-third of the total phosphates in the urine. They are derived chiefly from the food. They are only soluble in acid urine, for when the urine is faintly acid, neutral or alkaline they precipitate as "white gravel" the amorphous calcium magnesium phosphate. When the alkalinity is due to ammonia, as in the ammoniaical decomposition of urine, they form the ammonium magnesium phosphate, or triple phosphates. Phosphaturia is due to undissolved earthy phosphates of Ca. and Mg. which are derived largely from the food, and it is usually an indication only of diminished acidity of the urine. For example, after a meal rich in the salts of the vegetable acids or carbonates there may be a temporary phosphaturia.

In children, owing, for example, to intestinal inflammation, calcium is not eliminated by the bowel and may appear in the urine as calcium phosphate (stellar phosphates), without increase in the total phosphorus excretion. This may give rise to scalding urine and frequent micturition.

In nervous and neurotic patients, or those under a severe nervous strain, there may be phosphaturia owing to diminished formation of HCL, on account of a general depression of metabolism. These patients are often dyspeptics and suffer from hyperchlorhydria, constipation, dull aching in the loins, scalding urine, and frequent and unsatisfactory micturition.

In the severe cases, called phosphatic diabetes, besides pain in the back, there may be aching in the suprapubic region and cystitis may arise, but there is no decomposition of the urine. Such pronounced phosphaturia may be a prelude to bacteriuria, especially when accompanied by dyspepsia and intestinal derangement of long standing.

Treatment of Phosphaturia.—

(1) In children the diet should be poor in calcium salts and a partly meat diet substituted for the milk.

(2) In adults, in depressed metabolism, give the patients the mineral acid they cannot make, e.g., nitro-hydrochloric acid dil.

(3) Suitable diet, change of surroundings, relief from worry. When hyperchlorhydria is present, then administer fruits and vegetables more freely in the diet.

(4) When triple phosphates are present in the urine relieve the cystitis.

Calculi of the earthy phosphates are greyish white in color,