

It has been observed, however, that the neutral salines in the urine and its pigments inhibit this decomposition.

Since the bi-urate is changed to the quadri-urate by the action of the acid urine, there is no more important fact to be remembered in the treatment of gravel and renal calculi than that uric acid cannot be deposited from alkaline urine, and that it cannot be deposited even prematurely in the renal passages even in urine that is neutral or feebly acid.

Hence uric acid gravel or calculi may be due to the following causes:

- (1) Excessive acidity of the urine.
- (2) Excessive concentration of the urine.
- (3) Deficiency in neutral salines.

(1) *Excessive Acidity of the Urine.*

The diet is important. Meat, since it increases the excretion of the acid sodium phosphate, the normal cause of the acidity of the urine, should be avoided and vegetables and fruits substituted, since their acids are excreted as the carbonates in the urine and therefore reduce its acidity. Alkalies may also be given, e.g.; Potassium citrate is one of the most useful; also plenty of fluids, water, Vichy water, milk, buttermilk.

(2) *Excessive Concentration of the Urine.*

(a) Avoid too long intervals between food, since fasting increases both the acidity of the urine and its concentration. Since sleep is the equivalent of fasting, the measures of relief should be given towards the end of the day, e.g., at bedtime.

(b) Free evacuation of the bowels is important, for the following reasons: The tissue purins ( $C_5N_4$ ) are probably synthesized from the proteins and carbohydrates of the food, and by oxidation of these purins, hypo-xanthin, xanthin, uric acid and urea are formed, in successive stages, the final oxidation of uric acid to urea taking place in the liver. If this last step fails uric acid may be in excess. Also, it is possible that there are certain intracellular ferments in the liver which cause destruction of the uric acid, i.e., uricolysis. Therefore, deficient action of the liver may leave the uric acid unchanged to urea.

(3) *Deficiency in Neutral Salines in the Urine.*

Since it has been shown that the neutral salines in the urine inhibit the change of the quadri-urates to the bi-urates and uric acid,

