tinization of urinary-tract mucosa was seen on histopathological examination.

The intake of animal protein, fat and vitamin A in stone-former adults was low. The amount of phosphate in the diet was found to be high in stone-former adults and the amount of protein and carbohydrate was found to be low in stone-former children. The aetiological factors contributing to the process of calculogenesis seem to be lack of control of urinary pH, crystalluria of calcium oxalate dihydrate, hypercalciuria, raised serum and urine mucoprotein, low protein and vitamin A intake and poor nutrition.

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The Uptake of Calcium from Urine *in vitro* by Powdered Phosphates and Oxalates

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Measurements of the quantitative uptake of ions from urine by the crystalline constituents of renal calculi might provide information about the degree of saturation of various urines. Also, information might be obtained on the presence of inhibitors of stone formation.

Experiments were performed in which powdered minerals and renal calculi were added to urine at controlled pH at 37°C. At pH 6.5 some sort of uptake occurs rapidly on to powdered phosphate calculus and a sample of hydroxyapatite. This occurs at all concentrations of urine calcium above about 0.25 mmol/l. It is not possible from these experiments to say whether the uptake was due to crystallization or entry into the liquid film surrounding the crystals. If it was the former then there seems to be little activity from inhibitors in urine. If it was the latter then from the high degree of uptake it seems that in the renal tract the local high concentration round a microlith may allow incorporation of salts into the stone by subsequent molecular rearrangement.

At pH 5.5 there is virtually no uptake on to phosphates. Moreover, there is very little uptake on to oxalate powder at this pH and at pH 6.5. This suggests either that oxalate of this particular structure is very much slower at growing, or that inhibitors are more effective.

The Detection of Heterozygotes for Homocystinuria by Oral Loading with L-Methionine

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Homocystinuria is an inborn error of methionine metabolism caused by deficiency of cystathionine synthase (EC 4.2.1.21). Up to now no conclusive distinction has been demonstrated between heterozygotes for homocystinuria and normal subjects after loading tests with L-methionine (see, e.g., Brenton, Cusworth & Gaull, 1965; Chase, Goodman & O'Brien, 1967).

In the present study oral L-methionine loads have been administered to six parents of homocystinuric patients and to seven normal adult subjects. Measurement of plasma concentrations of methionine, cysteine-homocysteine disulphide and homocysteine at specific times after methionine load were performed by automatic ion-exchange chromatography (Piez & Morris, 1960). The use of an automatic continuous-flow analysis system, in which the column effluent was monitored with iodoplatinate ($\text{H}_2\text{PtCl}_6\text{-KI}$) reagent (Awwad & Adelstein, 1966) and ninhydrin in parallel, facilitated the identification and quantitative determination of sulphur-containing amino acids in the urine of subjects loaded with L-methionine (Fowler, B. & Robins, A. J., unpublished work). The identity of sulphur-containing amino acids in urine was confirmed by analysis of relevant fractions of the column effluent by paper chromatography before and after treatment with Raney nickel.

Plasma amino acid analyses revealed significant differences in methionine concentration between heterozygotes and normal subjects at 4 h post load ($P < 0.01$) whereas differences in cysteine-homocysteine disulphide were highly significant ($P < 0.001$) at 12 h post load. Homocystine (0.002–0.011 $\mu\text{mol/ml}$) was detected in some post-load plasma samples from heterozygotes but not in normal subjects. The urine of each heterozygote contained significant amounts of homocystine (0.011–0.077 mmol/24 h) whereas only one normal subject excreted homocystine, but in an amount substantially less than that excreted by heterozygotes.

It was concluded that, in the subjects so far studied, the plasma concentration of cysteine-homocysteine disulphide after methionine load provided the most reliable biochemical parameter for distinction between heterozygotes for homocystinuria and normal subjects.