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.

The financial support of the Children's Research Fund, Liverpool (Research Fellowship for B.F.), The Action for the Crippled Child and the Friends of the Royal Manchester Children's Hospital is gratefully acknowledged.

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Fucose in Urine of Fasting Human Subjects

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By quantitative t.l.c. (Bell & Talukder, 1970) we observed that urines from fasting (12–15h) human volunteers invariably contained, besides galactose, glucose and fructose, the additional free monosaccharides ribose, xylose and arabinose. In experiments using a differential stain to reveal the sugar spots we found that fucose occupied the same chromatographic position as xylose. We could find no evidence of any chromatographic system in which fucose did not coincide with at least one of the accompanying urinary sugars (cf. Partridge, 1948).

One of us (M.Q.-K.T.) has now devised a rapid (65min) t.l.c. system that clearly separates fucose (R_F 0.72) from all other monosaccharides of 'fasting' urine (R_F 0.55 to 0.10); the method can be used quantitatively over the range 5–80 μ g. The plates are coated with Kieselguhr G (Merck) buffered with 0.15M- NaH_2PO_4 and developed with a mixture of ethyl acetate, methanol, butan-1-ol and water (16:3:3:2, by vol.). Sugars are revealed by spraying with aq. 90% acetic acid containing 1g of 4-aminobenzoic acid, 0.6g of sulphosalicylic acid (Bell, 1966) and 2g of SnCl_2 . After heating at 110°C for 20min hexoses show up yellow and pentoses pink, enabling separation to be confirmed. Areas containing the 6-deoxy sugars are scraped off, extracted with 90% acetic acid containing 2% (w/v) of SnCl_2 and the extinction read at 370nm, when a stoichiometric relationship holds between E 0.04 (5 μ g) and 0.6 (80 μ g) for each sugar.

Results from normal subjects and some pathological subjects will be presented.

We are indebted to the Medical Research Council (D. J. B.) and the Government of East Pakistan (M.Q.-K.T.) for financial support.

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The Metabolism by Rats of Phenylmercury Acetate

By J. W. DANIEL and J. C. GAGE. (*Imperial Chemical Industries Ltd., Industrial Hygiene Research Laboratories, Alderley Park, Cheshire, U.K.*)

We have previously shown (Daniel & Gage, 1969; Daniel, Gage & Lefèvre, 1971) that methoxyethylmercury salts are rapidly degraded by the rat to yield mainly ethylene and inorganic mercury. This is probably connected with their lability *in vitro* in the presence of acid and cysteine (Weiner, Levy & Mudge, 1962). Phenylmercury salts are stable under these conditions, yet they are known to be rapidly metabolized in the rat to yield inorganic mercury (Gage, 1964).

The metabolism of phenylmercury in the rat has been studied after the subcutaneous administration of [^{14}C]phenylmercury acetate. About 85% of the radioactivity appeared in urine within 4 days and about 5% in the breath. Most of the mercury (50–60%) was excreted in faeces, with about 12% in urine.

About 2.5% of the dose appeared in urine as unchanged phenylmercury. Most of the radioactivity in urine was associated with sulphate and glucuronic acid conjugates of phenol. It seems likely therefore that phenylmercury is hydroxylated before cleavage of the carbon-mercury bond; if breakdown before hydroxylation occurred it is probable that substantial amounts of benzene would have been detected in expired air. Hydroxyphenylmercury salts are unstable *in vitro* in acid-cysteine, so it is possible that the liberation of inorganic mercury *in vivo* is not catalysed by an enzyme system.

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C₂₉-Carboxylic Acid Intermediates of Cholesterol Biosynthesis in Rat Liver

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Cholesterol biosynthesis from lanosterol in liver involves oxidative demethylation at C-14 and C-4 for which the sequence $\text{RCH}_3 \rightarrow \text{RCH}_2\text{OH} \rightarrow \text{RCHO} \rightarrow \text{RCOOH} \rightarrow \text{RH} + \text{CO}_2$ has been suggested (Olson, Lindberg & Bloch, 1957). Carboxylic acids are the only intermediates in this demethylation sequence to have been trapped (Miller & Gaylor,