view of the fact that arginine is only a semi-essential amino-acid. The results of Penn, Mandeles and Anker[12] suggest that the rate of re-utilization must be different for each individual amino-acid.

On the basis of kinetic data, Swick[6] was able to give a more precise definition of the extent of amino-acid re-utilization in the liver. He defines it as the probability that the carboxyl-carbon atom of arginine, liberated from liver protein by catabolism, will be re-incorporated in liver protein. Under his experimental conditions this probability was about 50 per cent. If in the present experiments all the arginine entering the liver pool from different sources had had the same specific activity, the "isotope replacement ratio" would be identical with the probability ratio calculated by Swick. The fact that they are of the same order of magnitude suggests that the isotope replacement ratio may be a useful indication of the extent of amino-acid re-utilization in the strict sense defined by Swick. Because an increase in the extent of re-utilization may be an important feature of the process of adaptation to low protein intakes, even an approximate quantitative measurement of the effect may be of value.

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Intracellular Repressor of Alkaline Phosphatase

THE repression of β-galactosidase in *Escherichia coli* has been demonstrated to be sensitive to 2,4-dinitrophenol[1]. This presumably indicates that high energy phosphate bonds are involved. Alkaline phosphatase is repressed by *ortho*-phosphate in the medium. We have used this as a test to determine whether high energy phosphate bonds are essential to the mechanism of enzyme repression. Is the intracellular repressing phosphate *ortho*-phosphate or must it participate in a high energy compound for the formation of "active repressor"?

Cells of *E. coli B* were grown and alkaline phosphatase assayed as previously reported[2]. Addition of 0·001 M 2,4-dinitrophenol had no effect on enzyme production or repression. 0·01 M abolished enzyme synthesis. We were unable to find any concentration that stimulated alkaline phosphatase production. A similar result was obtained with arsenate. If, then, *ortho*-phosphate is itself the intracellular repressor, a phosphate acceptor which would reduce the intracellular concentration of *ortho*-phosphate should stimulate enzyme synthesis. Various nucleosides were tested, and it was found that inosine stimulated normal enzyme production and also reduced the amount of time required for recovery from repression by added phosphate (Fig. 1). A similar but less pronounced effect occurred with guanosine and adenosine.

Manson *et al.*[3] have discovered a mechanism for repression of alkaline phosphatase synthesis by *ortho*-phosphate in a particulate fraction of *E. coli*. Our observations make it more probable that the intracellular repressor is indeed *ortho*-phosphate and that their mechanism is the one operative *in vivo*. In view of this, the function

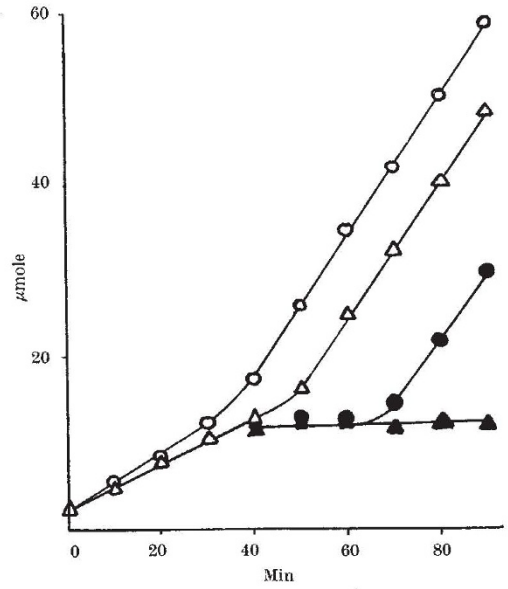

Fig. 1. *E. coli* was grown and the enzyme induced as previously described in run 1 (△). In run 2 (○) the induction medium was fortified with 0·01 M inosine. After 30 min, 0·001 M sodium monohydrogen phosphate was added to portions of run 1 (▲) and run 2 (●). 0·5 ml. portions were withdrawn at the times indicated and the enzyme assayed. The vertical scale represents micromoles of *p*-nitrophenyl phosphate hydrolysed in 60 min.

of the organic repressor the properties of which have been inferred[4] becomes even more obscure.

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A Sex-determined Renal Calcification in Rats

AN examination of several hundred white Wistar rats from the only source of laboratory animals available to this institution revealed a 100 per cent incidence of renal calcification in female animals and a complete absence of this condition in males of the species. This situation also applied to pure line white Wistar, black Wistar and black and white Wistar strains but was not observed in several species of mice from the same source and fed the identical diet.

These animals were bred and maintained on a commercially produced feed pellet with a calcium and phosphorus content of 2·0 per cent and 1·6 per cent of the dry weight respectively. The relatively high level of these two elements was found to result from the use of bonemeal in the pellets. The renal calcification, however, could not simply be related to the intake of these minerals as female rats bred and raised on synthetic diets[1] (calcium 0·31 per cent, phosphorus 0·27 per cent) also showed invariable occurrence of the nephrocalcinosis. A satisfactory control diet was provided by the use of 'Farex' (Glaxo Laboratories, Ltd.), a supplemented, mixed cereal baby food, and milk (1 : 5 w/v). This diet had a content of 0·88 per cent calcium and 0·68 per cent phosphorus on a dry weight basis, and female rats were free of kidney deposits after even 6 months on this diet. The condition also did not occur in female animals raised on a low phosphorus rachitogenic diet[2] (calcium 1·42 per cent, phosphorus 0·28 per cent), which is not surprising in view

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