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Metabolism of Methionine in a Case of Cystinuria.

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The metabolism of dl-methionine in cystinuria has been studied in a male cystinuric (age 14 years) using a normal subject of the same age and sex as a control. The oxidation of l-cystine has also been compared with that of racemized cystine. While both are readily oxidized, the urinary results indicated slightly more efficient oxidation of the l-cystine, confirming the work of duVigneaud, *et al.*[1]

Administration of dl-methionine equivalent to 0.500 gm. S with urine collection for the following 48 hours results in an increase in sulfate sulfur corresponding to approximately two-thirds of the methionine administered with a simultaneous increase in unoxidized sulfur. The excretion of the extra sulfur by the cystinuric is much slower than by the control. In the cystinuric, no significant increase in the cystine output was observed by the Sullivan method.[2]

Methionine determinations[3] were run on all urines. Normal urines give a small titration by this method and both normal and the cystinuric subject showed 4 to 6 fold increases in the titration during the 24 hours following methionine ingestion. However, the absolute amount of the increase accounts for not more than 10 to 15% of the methionine sulfur. With both subjects, the increase in unoxidized sulfur was too great to be accounted for by the methionine increase. The urine of the normal subject after methionine administration gave negative cyanide-nitroprusside tests.

Prolonged daily administration of 10 gm. sodium bicarbonate (or its equivalent in sodium citrate) over a period of months has not changed the cystine output.

Administration of equimolar amounts of glycine and glutamic acid for a period of one week was also without effect on cystine excretion.

The increase noted by Brand, Harris and Biloon[4] in the appar-

[1] duVigneaud, V., Craft, H. A., and Loring, H. S., *J. Biol. Chem.*, 1934, **104**, 81.

[2] Brand, E., Cahill, G. F., and Harris, M. M., PROC. SOC. EXP. BIOL. AND MED., 1934, **31**, 348.

[3] Baernstein, H. D., *J. Biol. Chem.*, 1934, **106**, 451.

[4] Brand, E., Harris, M. M., and Biloon, S., *J. Biol. Chem.*, 1930, **86**, 315.

ent cystine content of these urines on standing, as indicated by the Sullivan method, has also been observed by us.

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A Preliminary Analysis of the Spectra of Some Hemoglobin Derivatives.*

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The absorption spectra of oxyhemoglobin, carboxyhemoglobin, cyanhemoglobin, methemoglobin (pH 5.9) and methemoglobin (pH 9.2) have been studied quantitatively in both the visible and ultraviolet regions.

These pigments have complex absorption patterns. The absorption curves are all very different in the visible region, but exhibit a general similarity of shape in the ultraviolet where most of the light absorption is evident.

The absorption curves of certain far simpler substances have yielded to an analysis which resolves the complex of peaks and troughs into a series of curves (bands), whose summation gives the observed absorption pattern.[1] Bands whose peaks are at equal frequency distances from each other may be considered to possess an intimate relationship, and probably represent the same fundamental disturbance in the molecule caused by the absorption of energy. This is an important deduction since it greatly simplifies the interpretation of a complex absorption curve.

It is noteworthy that this type of analysis may be applied to the absorption curves of such complex molecules as these various hemoglobin derivatives. The spectrum of cyanhemoglobin is composed of a single series of bands, spaced at regular intervals. The absorption curves of the other pigments studied possess bands which belong to the same series, although they also show other bands. Cyanhemoglobin and oxyhemoglobin may be used as examples (Table I).

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[1] Hagenbach, A., and Percy, R., *Helv. Chim. Acta*, 1922, **5**, 454. Brode, W. R., *Proc. Roy. Soc. (Lond.)*, A, 1928, **118**, 286.