

The completeness of the hydrolysis of the proteins was determined by experiment for periods of 2, 4, 8, and 24 hours and checked against Van Slyke's procedure. It was found that there was no further hydrolysis at the end of 24 hours than at the end of 2 hours, but to insure complete hydrolysis of the various blood samples the 4-hour period was employed.

The formation of humin nitrogen from the basic amino nitrogen is rather small. Roxas<sup>5</sup> showed that less than 10% of the basic amino nitrogen played any rôle in humin nitrogen formation. In the results reported here the differences in basic amino nitrogen between normal and hypertensive animals is far too great to be explained by the possibility of humin nitrogen formation from this fraction.

In the control animals there were no appreciable changes in the total nitrogen, amid nitrogen, or amino-nitrogen fractions or a rise of blood pressure after injection of putrescin, tryptophane, or tyrosin.

In those animals in which hypertension was produced by the injection of aspartic acid and guanidine very definite changes were observed in the blood serum fraction. (Table I.)

The basic amino nitrogen precipitated by phosphotungstic acid is about 20% of the total nitrogen after hydrolysis for normal animals, and the monoamino nitrogen is between 70-80%. In those animals with hypertension the basic amino nitrogen varied between 4.9-10%, while the monoamino nitrogen varied between 80-90%. There were no changes in the amide nitrogen either before or after injection of aspartic acid or guanidine.

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#### Studies in Hypertension. III. Blood Proteins in Children with Hypertension.

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In rabbits with hypertension changes in the basic amino nitrogen, and the monoamino nitrogen fractions of the blood proteins have been described by Bernhard and Drekter<sup>1</sup>. The investigation has

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<sup>5</sup> Roxas, M. L., *J. Biol. Chem.*, 1916, **27**, 71.

<sup>1</sup> Bernhard, A., and Drekter, I. J., *Proc. Soc. Exp. Biol. and Med.*, 1932, **29**, 1245.

been extended to include a study of the blood of normal children and the blood of children and adults with hypertension.

Fifteen normal children between the ages of 17 months and 12 years served as controls. In this group the basic amino nitrogen content of the whole blood varied between 370 and 620 mg. per 100 cc., and the monoamino nitrogen between 1200 and 1990 mg. per 100 cc. Considered in per cent of the total nitrogen after hydrolysis the basic amino nitrogen of the whole blood varied between 19.4% and 27.0%, while the monoamino nitrogen varied between 62 and 79%. The basic amino nitrogen in the red cells varied between 280 and 490 mg. per 100 cc., and the monoamino nitrogen between 900 and 1650 mg. per 100 cc. The percentage of the total nitrogen after hydrolysis ranges between 17.8% and 27.8% for the basic amino nitrogen. The basic amino nitrogen of the serum protein is fairly constant from 100-150 mg. per 100 cc. and the monoamino nitrogen is between 300 and 420 mg. per 100 cc. The variation in per cent of total nitrogen after hydrolysis varies between 20.0% and 27.8% for the basic amino nitrogen, and between 55.5 and 77% for the monoamino nitrogen.

The blood proteins were analyzed in 4 cases of hypertension. One case, a child, 4 years of age, had a blood pressure of 170/86 mm. The other 3 cases were adults, with blood pressures of 170/95, 230/124, and 210/125 respectively. In all of these cases the blood urea and creatinine were within normal limits.

In all 4 cases of hypertension there was a marked decrease in the basic amino nitrogen precipitated by phosphotungstic acid, of the serum protein fraction of the blood. The values for this fraction varied 60 and 80 mg. per 100 cc., while the per cent of the total nitrogen after hydrolysis varied between 10.3 and 15.0%. There was an increase in the monoamino nitrogen fraction.