urine of adrenalectomized rats decreased significantly, whereas there was slight increase in that of dioxogulonate. Also, there was slight decrease in the total ascorbate content of blood.

Decreases of about 20 and 30% were observed in the activities of D-glucurono- δ -lactone hydrolase and L-gulono- γ -lactone oxidase respectively, whereas that of L-gulono- γ -lactone hydrolase remained practically unchanged. An appreciable increase in the activity of dehydroascorbate and a moderate increase in that of dioxoaldonate decarboxylase were observed in liver and kidney of adrenalectomized rats. All corresponding alterations were more conspicuous in rats 12 days after adrenalectomy.

Hepatic Enzymes and Vitamin Deficiency

By MAHTAB S. BAMJI and D. SHARDA (*National Institute of Nutrition, Indian Council of Medical Research, Jamai-Osmania P.O., Hyderabad-7, A.P., India*)

Enzymic changes associated with deficiency of B-complex vitamins have in recent years become the basis of functional tests for the evaluation of nutritional status of certain vitamins (Bamji, 1969, 1970). Since multiple deficiency is normal in Nature, the influence of nutrients other than the vitamins in question on the test has to be known. Erythrocytes form a convenient biopsy tissue, and metabolic alterations in erythrocytes can be expected to indicate the trend in other tissues as well.

In this study the effects of thiamin, riboflavin and pyridoxine deficiency on the activities of hepatic transketolase and glutathione reductase were studied. In addition to thiamin deprivation, pyridoxine deficiency also produced a significant depression in transketolase activity but no change in thiamin concentration.

In a longitudinal experiment erythrocyte glutathione reductase was found to be more sensitive to riboflavin deficiency than was liver glutathione reductase, though the riboflavin content of the liver diminished at a faster rate than that of the erythrocytes. Hepatic xanthine oxidase was more sensitive than was glutathione reductase.

Liver enzymes of deficient animals could not be stimulated by addition of the corresponding co-enzymes *in vitro*.

Bamji, M. S. (1969) *Clin. Chim. Acta* **26**, 263

Bamji, M. S. (1970) *Amer. J. Clin. Nutr.* **23**, 52

Studies on the Biochemical Parameters of the Ontogenesis of Electrical Activity in Developing Chick-Embryo Brain

By ZAFAR IQBAL, NARGIS F. JAFFERY and G. P. TALWAR (*Department of Biochemistry, All India Institute of Medical Sciences, New Delhi-16, India*)

In the developing chick brain spontaneous and evoked electrical activity matures on or about day 12 of incubation and is practically absent at the embryonic age of 4 days or less. Present studies aim at the systematic analyses of the pertinent chemical and enzymic changes that underlie the development of such functional attributes in the maturing brain. The activities of $\text{Na}^+ + \text{K}^+$ -stimulated adenosine triphosphatase, an enzyme implicit in the active transport of cations, and that of acetylcholinesterase, an enzyme involved in synaptic transmission, have been found to increase with the increasing age of the embryo. Further, the increase in the activities of these enzymes show a correlation with the onset and maturation of electrical activity in brain. Changes in these membrane-linked enzymes also imply the changes in the structural components of the membrane with age. In this context membrane proteins have been extracted from synaptosomal fractions isolated from chick brain of various ages. The electrophoretic profiles of these proteins have been studied on polyacrylamide-gel columns. The results will also include the observations taken on the content of gangliosides, the membrane markers, and that of phospholipids at various stages of the development.

Photolysis of Citrulline in the Presence of Hydrogen Peroxide

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Irradiation of aqueous solution of citrulline (5 mM), pH 5.2, with u.v. light (high-pressure mercury-vapour lamp) in the presence of H_2O_2 (2.94 mg/ml) resulted in the formation of ammonia, urea and amino acids. Irradiation of citrulline without H_2O_2 was found to produce only ammonia and urea. The formation of these products as a result of irradiation was found to be related to the period of irradiation. H_2O_2 alone was found to be ineffective.

After irradiation of citrulline in the presence of H_2O_2 for 2h no significant change in pH was observed. The amount of H_2O_2 consumed was 1.75 mg/ml. The sample was subjected to ion-exchange chromatography on Dowex 50 (X8; Na^+ form) as the ion-exchanger. A 15cm column was used for basic