Pacific Coast Branch.

Hopkins Marine Station, Pacific Grove, April 29, 1929.

4432

Effect of Insulin on Protein Metabolism. The Rôle of Hypoglycemia.*

JAMES MURRAY LUCK AND JEAN SPAULDING.

From the Biochemical Laboratory, Stanford University.

In our studies of the effect of insulin upon protein metabolism we have been concerned most recently with the rôle of hypoglycemia in relation to the changes in the amino acid content of the animal. It was demonstrated by Kiech and Luck[1] that insulin decreased the amino acid nitrogen and increased the rate of urea formation but the extent to which these effects were secondary to the accompanying hypoglycemia was not determined. The experiments which we have conducted are similar in principle to those of Kiech and Luck. Standard albino rats in groups of 6 were used. Each group was divided at the time of experiment into 2 sets of 3 each. The members of the first set received insulin subcutaneously (6 units per kilo). Immediately after, 1 cc. of 20% glucose was administered A second injection of the same amount of glucose was made an hour later. The control animals received insulin only, 1 cc. portions of 0.9% sodium chloride being given in place of the glucose administered to the experimental animals. One half hour after the last injection the bladders were emptied and the animals placed in individual, small, metabolism cages. Thereafter the animals constituting a set, were killed at intervals of 1, 3, and 4 hours. The whole carcass, including any urine voided within the time, was analyzed for amino acid nitrogen and urea. Forty-nine animals were used. The results are presented in Table I.

As was observed by Kiech and Luck, insulin alone was found to decrease the amino nitrogen content of the animal. The administration of glucose with the insulin did not nullify the characteristic

* This investigation has been made with the assistance of a grant from the Committee on Therapeutic Research, Council on Pharmacy and Chemistry, American Medical Association.

[1] Kiech, V. C., and Luck, J. M., *J. Biol. Chem.*, 1928, lxxviii, 257.

TABLE I.
The Effect of Insulin on the Amino Nitrogen Content of Rats.

Insulin	Saline	Insulin and glucose	Insulin
36.8	44.8	39.5	36.5
40.2	50.1	39.9	38.8
43.9	43.9	37.4	41.6
39.5	49.5	45.0	36.5
41.8	47.4	36.3	39.7
40.2	46.4	36.5	43.0
41.9		38.0	39.4
42.0	47.1	37.4	37.9
42.5	46.5	38.2	38.2
42.4	47.0	47.0	36.5
35.4	40.5	36.5	44.2
32.2	37.9	40.2	41.9

insulin effect. Although these experiments are preliminary in nature, they necessitate the conclusion that the effects of insulin on protein metabolism are not secondary to the accompanying hypoglycemia but are probably primary phenomena. The final report will include the results of urea estimations and experiments in which the hypoglycemic action of insulin has been combated in other ways.

4433

Infection of Monkeys With Poliomyelitis Virus by the Gastro-Intestinal Route.

E. W. SCHULTZ.

From the Department of Bacteriology and Experimental Pathology, Stanford University, California.

Aycock[1, 2] has recently reported 3 outbreaks of poliomyelitis which he believes can be traced to contaminated milk. The observations recorded by Aycock are of particular interest in the face of essentially negative results which have been realized under experimental conditions. Leiner and v. Wiesner[3] succeeded in producing the disease in only 2 out of 5 monkeys fed with large quantities of the virus, after neutralizing the hydrochloric acid of the stomach with sodium bicarbonate and reducing the motility of the intestines

[1] Knapp, A. C., Godfrey, E. S., Jr., and Aycock, W. L., *J. Am. Med. Assn.*, 1926, lxxxvii, 635.

[2] Aycock, W. L., *Am. J. Hyg.*, 1927, vii, 791.

[3] Leiner, C., and v. Wiesner, R., *Wien. Klin. Woch.*, 1910, xxiii, 91.