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Effect of Thyroxin on Carbohydrate Metabolism of Hypophysectomized Rats.*

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Hypophysectomized rats differ from the normal in the disposition of fed carbohydrate, depositing a smaller proportion of absorbed glucose and oxidizing a greater part.[1] However, the actual amounts of carbohydrate oxidized appear to be about the same in the 2 cases; for not only is the oxygen consumption low in hypophysectomized rats, but also the rate of absorption of glucose from the intestine in these animals is decreased by about one-third. Whether, if the intestinal absorption rate were nearer normal, the proportionate disposition of the absorbed carbohydrate would also be different has not been known.

It was found by Althausen[2] that treatment with thyroxin produces a marked increase in the absorption rate of glucose and other sugars in normal rats; therefore, at Dr. Althausen's suggestion (personal communication) the possible effects of thyroxin on the rate of absorption of glucose and its disposition were investigated in hypophysectomized rats.

Hypophysectomized rats, 2 weeks post operative, weighing 150 to 180 gm., were given 10 to 20 gamma of crystalline thyroxin daily for 10 days. Then, after being fasted for 18 hours, the rats were fed glucose and the disposition of the carbohydrate was determined as described elsewhere.[1] Determinations were also made of the carbohydrate levels and respiration of unfed hypophysectomized rats treated with thyroxin.

The amounts of thyroxin given, although very small, were sufficient to increase the glucose absorption rate of the hypophysectomized rats quite to normal. The oxygen consumption was increased about 30%, although being still somewhat subnormal. Under these conditions, the proportionate disposition of the absorbed carbohydrate was practically unchanged from that found in untreated hypo-

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1 Russell, J. A., PROC. SOC. EXP. BIOL. AND MED., 1937, **37**, 31; *Am. J. Physiol.*, in press.

2 Althausen, T. L., *J. Clin. Invest.*, 1937, **16**, 658.

physectomized rats. The actual amounts of carbohydrate deposited were increased only in proportion to the change in absorption rate; the amount of carbohydrate apparently oxidized was increased approximately in proportion to the increase in oxygen consumption. The maintenance of carbohydrate levels in the fasted hypophysectomized rats was not improved in any case by the thyroxin treatment. It was concluded, therefore, that thyroxin substitution therapy in hypophysectomized rats can completely restore the rate of absorption of glucose from the intestine, as it does the basal metabolic rate; but that it does not otherwise improve the carbohydrate metabolism of these animals.

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Effects in Female Young Born of Pregnant Rats Injected with Androgens.

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Hormonal factors are known to influence parturition and the condition of the young. Interference with parturition in the rat has been reported with pituitary and placental extracts and pregnancy urine,[1] pituitary implants,[2, 1e] luteal extracts,[3] hypophysectomy,[4] estrogens,[5] and androgens.[6] The present report deals with some of the permanent effects on female rats whose mothers received androgenic substances during pregnancy.

Study has been made of 10 female young which have grown to

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3 Nelson, W. O., Pfiffner, J. J., and Haterius, H. O., *Am. J. Physiol.*, 1930, **91**, 690.

4 Pencharz, R. I., and Long, J. A., *Am. J. Anat.*, 1933, **53**, 117.

5 *a.* Parkes, A. S., *J. Physiol.*, 1930, **69**, 463; *b.* Hain, A. M., *Quart. J. Exp. Physiol.*, 1935, **25**, 131.

6 *a.* Dantchadoff, V., *Compt. rend. Soc. de biol.*, 1937, **124**, 516; *b.* Greene, R. R., and Ivy, A. C., *Science*, 1937, **86**, 200; *c.* Hamilton, J. B., and Wolfe, J. M., *Anat. Rec.*, in press; *d.* Scipiades, E., PROC. SOC. EXP. BIOL. AND MED., 1937, **37**, 242.