A peripheral action of the benzothiadiazine compounds on tissue glucose metabolism has been suggested by *in vivo* experiments. Tabachnick *et al* found that the hyperglycemia due to diazoxide occurs even in depancreatized or alloxanized animals(5). Evidence for a possible peripheral effect of chlorothiazide on membrane premeability to phosphorus has been presented by Beardwood *et al*(6). The current studies substantiate a direct action of these agents on fat tissue.

Summary. Chlorothiazide added directly to the incubating medium decreases the *in vitro* rate of utilization of glucose by rats' adipose tissue. The degree of reduction in glucose utilization is greater as the amount of chlorothiazide present in the medium is increased. It can be demonstrated even with low concentrations of the drug (1×10^{-6} molar). These experiments demonstrate a direct inhibitory effect of chlorothiazide on the glucose utilization of fat tissue.

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Brain Maturation in the Neonatal Rat after Varied Light Cycles.* (31708)

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Previous studies have shown effects of varied light cycles upon growth and reproduction of birds and mammals(1,2,3). Continuous illumination directed on specific hypothalamic areas influenced gonadotropin release and the estrous cycle(4,5). LH concentration was markedly decreased in the pituitaries of rats after 50 days of continuous light(6). Furthermore, photovoltaic cells stereotaxically implanted in the hypothalamus of rodents have shown that light penetrates the mammalian brain(7).

This investigation was undertaken to study the effects of various light patterns upon brain maturation and brain convulsibility. The rat was the experimental animal used because its central nervous system is still partially immature during the first few weeks of life(8).

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The phases of postnatal brain development in the rat are characterized by specific responses to electroshock and a correlation exists between these responses and developmental changes which are both biochemical and structural(9,10).

Material and methods. A total of 16 litters, 8 Long-Evans rats per litter, was used for this experiment. A standard rat pellet diet and water were given *ad libitum* to the mothers and after weaning to the young rats. The animal rooms had a constant temperature of 72°F and were artificially illuminated by automatic light switches regulated for control and experimental groups.

Beginning at one day of age 4 litters with mothers were subjected to one of the following light schedules: 1) 12 hours of light followed by 12 hours of dark, control environment, 2) 6 hours of light alternated by 6 hours of dark, 3) continuous light and 4) continuous dark.

Convulsive seizures were produced by electroshock stimulation through corneal elec-

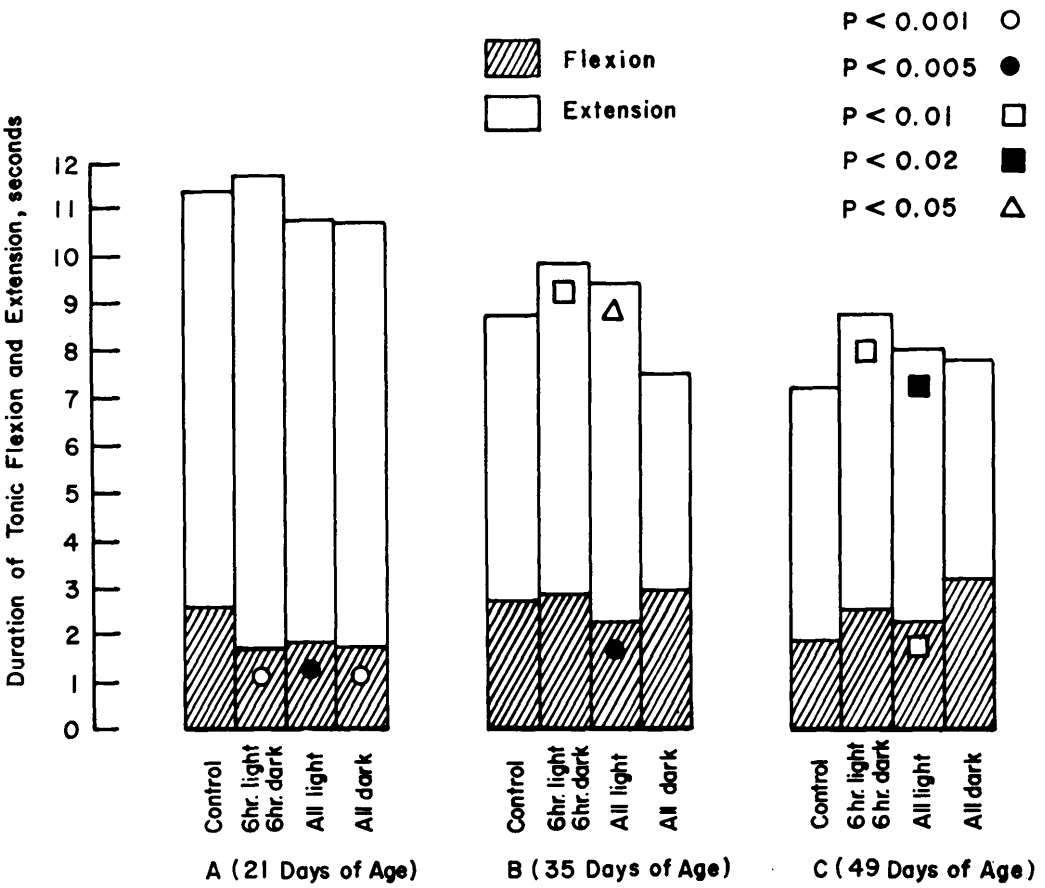

FIG. 1. Long-term effects of varied light schedules on tonic flexion and tonic extension in young rats at a) 21 days of age, b) 35 days of age, and c) 49 days of age. Ordinate is duration of tonic flexion and tonic extension in seconds. Abscissa indicates light cycles.

trodes(11,12). In the neonatal rats, daily electroshocking produces a high mortality rate (12). Rats from each light schedule and controls were further subdivided; half of the animals in each environment were shocked on alternate days beginning on day 11 of age, the other half beginning on day 12 in order to study development of all tonic phases. Thus, half the animals from each category were shocked on alternate days until the appearance of the adult maximal electroshock seizure response (MES). The adult MES pattern (fully mature pattern) is characterized by the following sequence of phases: hindlimb tonic flexion, hindlimb tonic extension and whole body clonus. All data were subjected to the T-test to determine significance.

After the appearance of the first MES, experimental animals were placed in the control environment until they were sacrificed by decapitation at 49 days of age. Adrenals, pituitary and thymus were weighed fresh.

Results and discussion. The varied light schedules hastened the appearance of the adult seizure pattern in all categories studied. The fully mature tonic-clonic electroshock seizure pattern appeared at 22.5 days of age in control environment; the pattern was hastened to 19.9 $\pm$ 0.02, 21.1 $\pm$ 0.07 and 21.4 $\pm$ 0.3 days of age when the animals were subjected to 6 hours of light alternated by 6 hours of dark, continuous light and continuous dark, respectively. In succession P-values, control *versus* varied light treatment, are <0.001, <0.005, <0.05.

There was a shortening of flexion and/or a lengthening of extension in all experimental

rats as compared with controls at the first MES; these changes persisted in those animals subjected to 6 hours of light alternated by 6 hours of dark and in animals exposed to an all light environment until the rats were sacrificed at 49 days of age (Fig. 1). Shortening of flexion and/or lengthening of extension of the tonic phase of a maximal seizure indicate increased convulsive activity(13).

Weights of thymus glands were: 370 ± 1.7 mg/100 g body weight, control; 299 ± 1.6, 300 ± 2.1, 340 ± 2.7 mg/100 g body weight for animals subjected to 6 hours of light alternated by 6 hours of dark, continuous light and continuous dark, respectively. Significance of difference between experimental and control animals is <0.01 for each of the light schedules. Adrenal and pituitary weights remained unchanged.

It is possible that light cycles, as produced in this experiment, altered hypothalamic-hypophyseal pathways. Obviously, the hypophyseal gonadotropins can be influenced as evidenced by rats subjected to constant illumination(6). Ovarian steroids administered during the first week of life hastened brain maturation as measured by electroshock seizure responses and were less effective when administered during the second week of life (14). On the other hand, administration of cortisol during the second week of life hastened brain maturation(8). Thus, the ACTH-adrenal cortical axis may be involved in the present study since a modest thymic atrophy was noted and is a tissue responsive to corticoids(15).

Summary. Alterations in light cycles hasten brain maturation of the young rat, produce greater brain excitability and involution of the thymus gland.

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Influence of Protein Synthesis Inhibitors on Circulatory Dynamics.* (31709)

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It was recently demonstrated in this laboratory that actinomycin D, an inhibitor of DNA-dependent protein synthesis, lowered the blood pressure of normotensive and renal hypertensive rats(1). The degree of blood pressure depression was a function of the dosage, and was significant even in amounts well below that which induced general toxici-

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