effect upon the rate or intensity of growth of the bacterial species investigated and does not change the *p*H of the medium.

S. Stanley Schneierson
Daniel Amsterdam

Department of Microbiology,
Mount Sinai Hospital,
New York.
April 28.

Influence of Temperature and Light on Thyroid Function

Forty-four mature male albino rats weighing 150–180 gm. were divided into four equal groups. Two of these groups were kept at a temperature of 18° C., while the other two groups were maintained at 35° C. One group maintained at each temperature was kept continuously in light of intensity 30 ft.-candles, and the other groups were kept in darkness. After 12 days the animals were killed by decapitation under light ether anæsthesia, and their blood was collected. The levels of thyroid and thyrotrophic hormone in their serum was determined by the use of the stasis tadpole method[1]. The tadpoles were divided into five groups, each of twenty animals. A control group was injected with saline. The other groups of tadpoles were injected on alternate days with five injections of 0·02 ml. of serum obtained from the four groups of rats. Increase in length of the hindlimbs of the tadpole was the criterion of thyroid hormone concentration, while the increase in thyroid epithelial cell height was used as an index of thyrotrophic hormone-level in the serum of rats. The thyroids of the rats were examined histologically. They were fixed in Zenker without acetic acid and stained with Mallory's stain[2]. Analyses of variance and of correlation were performed.

At 18° C. the thyroids of the rats kept in darkness were heavier than those of rats exposed to light. At 35° C. the thyroids of the rats exposed to light were heavier than those of rats kept in darkness. The rats kept at 18° C. had more active thyroids and higher epithelia than those kept at 35° C. These findings are in agreement with those obtained by other investigators, indicating increased activity of the thyroid under the influence of cold and decreased activity at higher temperatures[3].

The rate of metamorphosis and the epithelial cell heights of tadpoles injected with serum obtained from rats confined to darkness at 18° C. were greater than those of rats maintained at the same temperature and exposed to light. At 35° C. this effect was reversed. Exposure to light induced a significant increase in thyroid and thyrotrophic hormones in the blood, whereas darkness decreased their level. These results indicate that there is a significant interaction between the effects of temperature and light on thyroid weights and levels of thyroid and thyrotrophic hormones.

Table 1. Influence of Temperature and Light on Thyroid Function

Treatment	Data obtained from rats		Data obtained from tadpoles	
	Thyroid wt. mgm./100 gm. body weight	Epithelial cell height (μ)	Mean increase of hind limbs above control (mm.)	Mean increase of epithelial cell height above control (μ)
Cold–light	5·77±0·68	10·47±0·04	1·01±0·53	2·49±0·01
Cold–dark	7·97±0·44	11·63±0·01	5·04±0·97	4·62±0·14
Temperature–light	7·45±0·55	9·36±0·14	5·01±1·08	4·12±0·17
Temperature–dark	5·38±0·67	9·53±0·01	1·81±0·57	2·24±0·20

± Standard error.

Although the levels of thyroid and thyroid stimulating hormones were high in the blood of rats kept at 35° C. and exposed to light, yet their thyroids were inactive from the histological point of view. The thyroid-stimulating hormone produced under such conditions is probably a stimulant to thyroid secretion, rather than to cell height.

Some investigators have found that exposure of animals to light stimulated thyroid function, while others state that rats confined to darkness have more active thyroids[4]. In the light of our results, it appears that the environmental temperature can modify or even reverse the effects of light and darkness on thyroid function.

F. A. Soliman
H. M. Badawi

Faculty of Veterinary Medicine,
and
Y. S. Ghanem

Faculty of Science,
Cairo University,
Giza.
April 24.

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Influence of the Thymus on the Reaction of the Adrenal to Adrenocorticotropic Hormone in the Rat

It has been shown previously that thymectomy is followed by a transitory stimulation of the adrenal in guinea pigs[1]. I have investigated whether this is due to interference of the thymus with the action of adrenocorticotropic hormone.

Eighty-eight male rats of a local inbred strain weighing 130–160 gm. were divided into two groups. Twenty-four rats in the first group were hypophysectomized, using Smith's method. Forty-eight rats in the second group were thymectomized by Segaloff's method and hypophysectomized ten days later. The technique of both operations was that described by Farris and Griffith[2]. From the sixth to the tenth day after the hypophysectomy, twenty-four thymectomized, hypophysectomized animals were injected daily with the thymus extract of Bezssonoff and Comsa[3], at the daily dose of 15, 30, 40, 50, 70 and 100 units[4] (four animals for every dose).

The hypophysectomized animals were kept at a constant temperature of 29 ± 5° C.

On the eleventh day after hypophysectomy, the animals were given a single intraperitoneal injection of adrenocorticotropic hormone (supplied by Messrs. Choay, Paris) as follows: (1) The hypophysectomized and the thymectomized and hypophysectomized animals which had not been treated with thymus extract received 0·4, 0·7, 1·0, 1·5 and 2·0 units (four animals of each group for every dose). (2) The