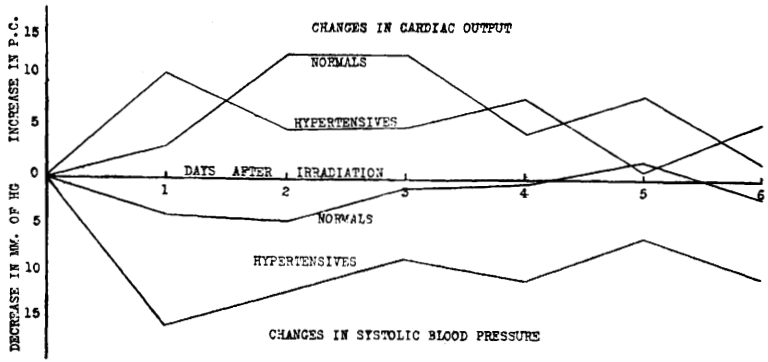

diation, while in the normals it is not manifest until the second or third day. In both types of individuals the first and foremost reaction to the irradiation is a widespread peripheral vasodilatation. In normal individuals this is compensated almost entirely by an increase in the cardiac output, the blood pressure remaining practically unchanged. In the hypertensives, on the other hand, there is nearly always a significant depression of the blood pressure, but the cardiac output, as above stated, may in individual cases increase, decrease, or remain unchanged. The prevailing response, however, is an increase, as in the normals, as shown by both its more frequent occurrence and its greater degree of magnitude.

These changes are quite temporary as a rule, and do not outlast the erythema to any extent. In a few cases the depression of blood pressure in the hypertensives has persisted for 10 to 12 days following the last irradiation.

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Effect of Light and of Darkness on Thyroid Gland.

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That darkness or the absence of ultraviolet radiation, particularly of the antirachitic portion, leads to an hyperplasia of the thyroid gland has been suggested by some investigators[1] and denied by

[1] See review by Levine, H., and Remington, R. E., *J. Chem. Ed.*, 1933, **10**, 649.

others.[2] A critical analysis of these results, however, reveals many discrepancies and contradictions.

The present study extended from November, 1932, through July, 1933, and involved the use of 140 albino rats. Of this number, 40 were offspring of stock animals bred and kept in the rat room illuminated by diffuse daylight filtered through window glass. The remainder were offspring of rats kept and bred in a dark room, the only radiation coming from a ruby lamp used for a brief period daily while feeding, cleaning, or weighing. The animals were grouped at weaning (21-28 days), weighed weekly, and kept under the various experimental conditions until they were from 12 to 16 weeks old. At the end of each 4-week period, representative animals from each group were sacrificed and the thyroids removed for histological examination. The experiments were divided into 2 series: (1) in which the rats were fed a balanced stock ration, Bal-Ra, rich in iodine; (2) in which the rats were fed bread and fresh milk, a diet relatively poor in iodine. In the first series, one-half of the animals born in light were allowed to remain in the "light room" and groups exposed for 15 minutes every other day at a distance of 1 meter from a flaming carbon arc, burning "Sunshine" carbons (total energy value of each exposure = 6.51 gm. cal. per sq. cm.; ultraviolet = 0.273 gm. cal. per sq. cm.) and to sunlight from 10 A. M. to 2 P. M. daily. The remaining 20 rats were placed in the dark room and kept there except when they were being irradiated. The same number of animals (40) born in darkness was divided so that half remained in the dark and the rest in the "light room" and were irradiated as above. The second series consisted entirely of animals born in the dark and was divided in a similar manner, except that in this series additional groups were exposed to the radiation from a quartz mercury vapor arc for 15 minutes every other day at 1 meter (total energy value of each exposure = 0.591 gm. cal. per sq. cm.; ultraviolet = 0.041 gm. cal. per sq. cm.) and to sunlight (4 hours daily) through window glass transmitting no wave lengths shorter than 310 mμ and under Corex purple glass, which transmits only ultraviolet radiation. Appropriate control groups were maintained throughout.

No significant differences could be detected in any of the experiments with respect to the body growth, size or histological picture of the thyroid gland. With few exceptions, all of the rats fed

[2] Von Fellenberg, T., *Biochem. Z.*, 1931, **231**, 205; McCarrison, R., *Indian J. Med. Res.*, 1932, **20**, 359; Kraus, W. E., and Monroe, C. F., *J. Biol. Chem.*, 1930, **89**, 581.

the stock diet in Series 1 showed non-hyperplastic thyroids irrespective of light environment. Likewise with few exceptions, the animals in Series 2 fed bread and milk showed various degrees of hyperplasia, which condition was not corrected or perceptibly modified by any of our experimental procedures. Our experiments fail to confirm the suggestion that darkness leads to thyroid hyperplasia or that antirachitic ultraviolet radiation is essential for the maintenance of proper thyroid development.