of marrow hyperplasia but also to actually initiate autochthonous extramedullary myelopoiesis in kidneys and spleen.

6205

Effect of Light on Rats Receiving a Complete Diet.*

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Conditions in our colony have been standardized as far as practicable. The diet is of the greatest simplicity and constancy.[1] The humidity is not controlled, but is recorded. The temperature is now maintained throughout the year at 26° ± 1°. The light is as uniform as natural light can be, coming through a window across the entire north wall of the colony. No direct sun enters the room.

Even with this uniformity of light from the north sky, it was thought that seasonal changes and location of cages might materially affect our experimental animals. At no time is there any ultraviolet light of antirachitic value in the room since the daylight is filtered through 2 thicknesses of window glass.

It is well known that light 2900-3100 A° in wave length has an effect on the metabolism of animals and is of very great importance if the animal is receiving a poor Ca:P ratio and lacks vitamin D in the diet. The recent work of Clausen[2] emphasizes the importance of a daily exposure of rats to infra-red radiation if the rats are rachitic. As little as 10 minutes a day of this light from a carbon arc with an energy value of only 0.122 cal/min/cm^2 was sufficient to markedly affect the rats.

The object of this experiment was to find out whether light materially affects the growth, food and water consumption, ovulation, lactation or bone analysis of rats maintained on our very simple but complete diets.

Albino rats (from our stock colony) were put in the experimental cages at weaning time (21 days after birth). They were kept in individual cages previously described.[1] The maintenance diet consists of pure casein 12.0%, sucrose 84.1%, salt mixture 3.9%,

* This work was made possible by a grant from the Committee on Radiation of the National Research Council.

[1] Burr, G. O., and Burr, M. M., *J. Biol. Chem.*, 1929, **82**, 345.

[2] Clausen, E. M. L., *J. Nutr.*, 1929, **2**, 125.

supplemented by the non-saponifiable matter from 70 mg. of cod liver oil and from 35 mg. of wheat germ oil fed on the daily yeast dose of 0.65 gm. This is a good diet when supplemented by 10 drops of corn oil.

It occurred to us that the rats might not respond to light treatment if the 10 drops of corn oil were omitted. This allows the skin to become scaly and dry. Therefore, 2 groups of animals have been maintained on this deficient diet.

Two dark rooms were built in the colony room and were ventilated with a blowing fan so that their temperature was almost exactly the same as that of the colony. These rooms were totally dark and were opened only when the colony room was dark. Very dim electric light was used while working with the animals. A total of 48 rats has been used.

Following Clausen's technique we irradiated half the rats in the dark rooms daily for 10 minutes with an Everready Sunshine Lamp,† (carbon arc, 13 amperes) at a distance of 1 meter.

After it was found that irradiation did not affect any of the groups materially the fat-starved rats were cured with 10 drops of corn oil so that reproduction could be studied. Therefore, the bone analyses are all on rats receiving fat.

The comparison of growth and food consumption of the different groups is given in Table 1. There does not seem to be any

TABLE I.
Comparison of Growth and Ovulation by Groups Irradiated and Not Irradiated.

Group No.	Fat in Diet	Irradiation	Average wt. at age 84 days	175 days	Average daily food consumption during 6th month
	%		gm.	gm.	calories
67	2	Irradiated	145	189	36.5
69	2	Not irradiated	136	184	36.9
68	0	Irradiated	117	140	35.2
70	0	Not irradiated	127	144	36.0
71	0	Colony light	139	147	39.4

consistent difference between the animals in some light and those in total darkness. All groups consumed almost exactly the same number of food calories daily, except the rats in the main colony room (Group 71). The only explanation for this result is that the rats in the open room are disturbed more by workers and show more activity.

† We are indebted to the National Carbon Company, Cleveland, for the use of the lamp and carbons.

Records of ovulation and reproduction show no consistent difference between the irradiated and unirradiated animals. Ovulation rates and number of young born per litter may be said to be identical for comparative groups.

Bone analyses gave very similar results for all animals, whether irradiated or not (Table II). Chick and Roscoe's A/R[3] is high

TABLE II.
Average Bone Analyses for all Irradiated and Non-irradiated Rats.

Groups	Calcium (Dry wt. basis)	Calculated on Wet Weight Basis				
		Water	Fat	Ash	Organic Residue	A/R
	%	%	%	%	%	
67 and 68 (Irradiated)	21.6	26.2	5.2	44.2	24.3	1.82
69 and 70 (Not irradiated)	21.3	25.2	6.2	44.3	24.3	1.82

and identical for the 2 groups. The calcium agrees well with the standards of Korenchevsky.[4]

Conclusions. Rats reared on a highly purified and very simple diet do not suffer appreciably from living in total darkness. They show no consistent response to daily irradiation with an open carbon arc.

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Site of Hypersensitiveness of the Exaggerated Sinus Caroticus Reflex.

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Before Hering's[1] discovery of the carotid sinus reflex, the slowing of the pulse which results from pressure over the upper area of the carotid artery, particularly on the right side of the neck, was interpreted as the direct effect of pressure upon the vagus nerve. Variations in the effect on heart rhythm were considered as indicative of the condition of the heart muscle and the Wenckebach[2] school

[3] Chick, H., and Roscoe, M. H., *Biochem. J.*, 1926, **20**, 137.

[4] Korenchevsky, V., Medical Research Council, Special Report No. 71 (1922).

[1] Hering, H. E., *Die Karotissinusreflex auf Herz und Gefasse.* Theodor Steinkopff, Dresden, 1927.

[2] Wenckebach, K. F., *Die Unregelmässige Herztatigkeit.* W. Engelman, Leipzig, 1914.