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Seasonal Variation of Antirachitic Effect of Sunshine in the
Latitude 42° 39' (Albany, N. Y.)

ARTHUR KNUDSON.

*From the Department of Biochemistry, Medical Department of Union University,
Albany Medical College.*

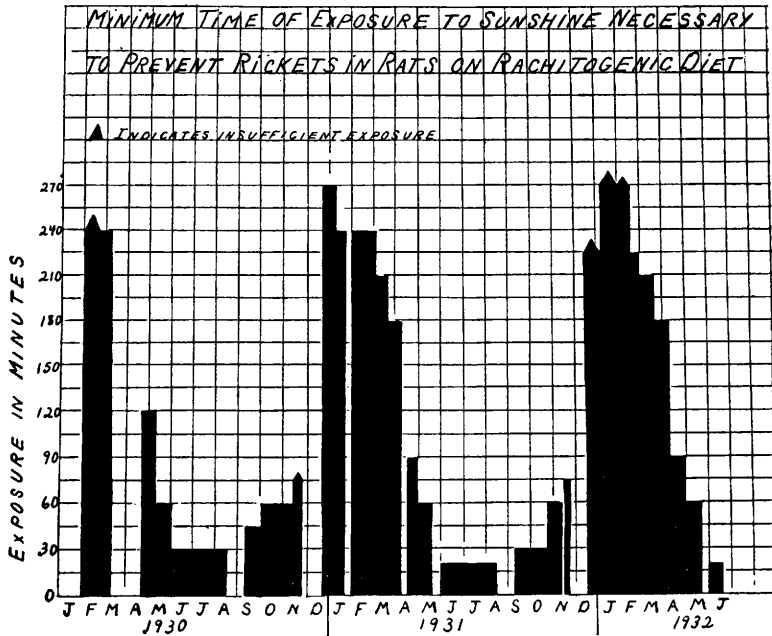
In the course of studies on the comparative value of various light sources for the cure and prevention of rickets¹ a study was also undertaken to determine the seasonal antirachitic efficiency of sunshine in latitude 42° 39' (Albany). These experiments have been continued over a period of 2½ years.

Rats at 4 weeks of age were put on the Steenbock rachitic diet 2965 and both the curative and preventive type of experiments were used. In the curative type of experiment the animals, having developed a severe degree of rickets within 21 days, were exposed to sunshine for varying lengths of time between 10 A.M. and 3 P.M. in the winter months and between 11 A.M. and 1 P.M. in the summer months. Treatment was continued for 21 days. In the preventive type of experiment the animals were exposed to the sun's rays for a period of 6 weeks from the time that they were put on the rachitic diet. Skyshine as well as sunshine was available in these experiments. No attempt was made to compensate for the cloudy days so that on cloudy days rats received skylight or reflected light from the clouds and sky. Several different dosages were tried in each type of experiment in order to determine the length of exposure required either to bring about complete healing of rickets within 3 weeks or to prevent the development of rickets. Diagnosis was based on roentgenograms. Along with these observations determinations of the ash in the dry fat-free extracted femurs were made and also in most instances the blood phosphorus.

In the curative experiments exposures of 240 to 270 minutes per day during the months of December and January showed very slight or no healing. In February, particularly the latter half, there is noted an increase in healing but it is not until April that 270 minutes exposure per day shows complete healing. The months of June, July and August are the most effective periods of the year and it was found that 90 to 120 minutes exposure per day gave complete healing. September, October, and November show

¹ Knudson, Arthur, *Am. J. Dis. Children*, 1932, 44, 531.

gradual falling off of antirachitic effect but beginning about December first there is a very decided decrease.



The preventive type of experiments show the variations throughout the year more strikingly than do the curative experiments. From the roentgenograms taken at intervals of 3 weeks the minimum length of exposure necessary to prevent rickets has been plotted and is shown on the accompanying chart. In this chart there are certain gaps, particularly in 1930, in which there were no experiments covering those periods. The year 1931 and 1932 up to June 20th are however more complete. In the latter half of December and the months of January and February 240 to 270 minutes exposure per day is just about sufficient to afford complete protection. There is some increase in antirachitic efficiency March first, but a much greater increase occurs around April first. June, July, and August require an exposure of only 20 minutes per day. The antirachitic effect of midsummer sunshine is therefore about 12 to 14 times that of midwinter sunshine. September, October and November show gradual decreases in antirachitic action of sunshine. In December as in the case of observations on curative experiments, there is a sudden drop in antirachitic activity.

Since very little radiation is effective through the hair and as has

been show previously² exposure of about one-eightieth of the surface area of the skin of the rat produces greater healing of rickets than of the whole animal, it may be inferred that perhaps the above data might be applied to humans. One-eightieth of the surface area in the human would always be less than the area of the face and hands. It should be possible to obtain ample radiation in this vicinity for the prevention of rickets for at least 8 to 10 months of the year by exposure of the face and hands to sunshine.

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Effects of the Introduction of Blood from Bred Rabbits upon Immature Rabbits.*

CHARLOTTE DUMONT, F. E. D'AMOUR AND R. G. GUSTAVSON.

From the Research Laboratories, University of Denver.

The purpose of this study was to demonstrate the occurrence of anterior lobe hormone in the blood of the bred rabbit during the time elapsing between coitus and ovulation.

In the first series of experiments 24 rabbits were bled to death at times varying between 1½ and 12 hours post-coitum. The serum varying in amounts between 20 and 60 cc. was injected into immature females. One animal that had received 60 cc. of serum from a donor killed 1½ hours post-coitum responded positively.

In the second series, the donors were killed between 1½ and 2 hours post-coitum, the blood defibrinated and immediately introduced intravenously into immature females which had first been bled of part of their own blood. Five of the 12 animals used

TABLE I.

Post Copulation Time	Blood Removed from Recip't	Blood Int'd from Donor	Time Killed Post-Injection	Results
Hr.	cc.	cc.	hr.	
1¾	50	95	51	Large Corp. Hemm.
1¾	55	100	51	„ „ „
1½	60	95	52	Corpora Lutea.
1¾	45	75	48	Large Corp. Hemm.
1¾	50	100	48	„ „ „

² Knudson, Arthur, *PROC. SOC. EXP. BIOL. AND MED.*, 1931, **29**, 314.

* This investigation was aided by a grant from the National Research Council, Committee for Research in Problems of Sex.